

Aircraft Instrument System

(According to the Syllabus Prescribed by
Director General of Civil Aviation, Govt. of India)

Volume : 1

FIRST EDITION

AIRCRAFT INSTRUMENT SYSTEM

Volume : 1

Prepared by

L.N.U.M. Society Group of Institutes

** School of Aeronautics*

(Approved by Director General of Civil Aviation, Govt. of India)

** School of Engineering & Technology*

(Approved by Director General of Civil Aviation, Govt. of India)

Compiled by

M.H. Sharma, A. Dhenki

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Abdul Aziz

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Dedicated To

Shri. Laxmi Narain Verma
[Who Lived An Honest Life]

Preface

Study of aircraft instrument system is having paramount importance for AMEs in Avionics stream. Modern day Aircrafts are developed with sophisticated instrumentation systems to provide minute indications and for stress reduction to the men behind the machines. There may be any amount of sophistication in the system but matter of fact is that every system is based on some fundamental principles, understandable to people with elementary knowledge of Physics and Maths.

The need has been felt for a book outlining the entire syllabus of Aircraft Instrument, as a student and teacher, containing objective type questions for those who aspire to fly in the open sky of Avionics. With all humbleness and a feeling of uncertainty this book was first submitted to the readers for their valuable verdict. Response from the readers and concerned person encouraged me and made me responsible for further improvement. This book in it's present form is the result of continuous development through experiences as a teacher and feed back received from our students and people related to the Aviation Industry. A single volume of book for studying day to day is a bit uncomfortable for students. Keeping this view in mind this edition of the book is published in two Volumes. Volume - I contains electrical aspects related to Aircraft Instrument System (Chapter 1 to 12).

My hurtful thanks to all who have helped me with their valuable suggestions and able guidance.

I am very much thankful to our Director Mr. C.C. Ashoka for his sincere guidance and encouragement for preparing this book.

I would very much appreciate all forms of suggestions and constructive criticisms. I shall gratefully acknowledge, if any error, bring to my notice.

Mr. A. Dhenki
(Senior Instructor)

Dated : April, 2007

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Continued to Volume : 2

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CHAPTER - 1

TERMINOLOGY AND CONVERSION

1. One inch of mercury is equal to _____ mm. of Hg
 - a. 13.60
 - b. 25.40 *
 - c. 2.54
 - d. None of above
2. One inch of H₂O is equal to how many pascals
 - a. 249.089 *
 - b. 0.036
 - c. 2.54 x 10⁻³
 - d. 13.60
3. One inch of Hg is equal to how many inches H₂O ?
 - a. 2.54
 - b. 25.4
 - c. 33.8
 - d. 13.60 *
4. One atmosphere is equal to
 - a. 1013.25 mB
 - b. 760 mm of Hg
 - c. 406.9" of H₂O
 - d. All of above are correct *
5. One inch of Hg is equal to how many millibars
 - a. 33.86 *
 - b. 254
 - c. 2.54
 - d. 25.4
6. One inch of H₂O is equal to how many millibars
 - a. 33.86
 - b. 2.54
 - c. 249.089
 - d. 2.490 *
7. One inch of H₂O is equal to how many PSI
 - a. 0.03613 *
 - b. 0.07355
 - c. 2.4 x 10⁻³
 - d. None of above
8. One kg per s cm is equal to _____ inches Hg
 - a. 1.019
 - b. 13.60
 - c. 28.96 *
 - d. 0.00099
9. One kg per s cm is equal to _____ mm of Hg
 - a. 28.96
 - b. 735.54 *
 - c. 2.490
 - d. None of above
10. One kg per s cm is equal to how many PSI
 - a. 28.9
 - b. 14.223 *
 - c. 1.201
 - d. None of the above
11. One millibar is equal to _____ Pascal
 - a. 100 *
 - b. 1000
 - c. 10
 - d. 1
12. One millibar is equal to _____ PSI
 - a. 0.0145 *
 - b. 0.0415
 - c. 0.0514
 - d. 0.514
13. One mm of Hg is equal how many Pascal
 - a. 51.33
 - b. 33.86
 - c. 133.322 *
 - d. 0.0397
14. One mm of Hg is equal to _____ inches of Hg
 - a. 0.03937 *
 - b. 0.9397
 - c. 45.54
 - d. None of above
15. One PSI is equal to _____ inches of Hg
 - a. 14.7
 - b. 29.9
 - c. 2.036 *
 - d. None of above
16. One PSI is equal to _____ Pascals
 - a. 6896.55 *
 - b. 1013.25
 - c. 8940.55
 - d. None of above
17. One PSI is equal to _____ inches of H₂O
 - a. 25.4
 - b. 27.68 *
 - c. 14.7
 - d. None of above
18. One PSI is equal to _____ mm of Hg
 - a. 51.71 *
 - b. 25.4
 - c. 33.06
 - d. 29.9
19. One PSI is equal to _____ kg per s cm
 - a. 0.0036
 - b. 0.0703 *
 - c. 48.4
 - d. None of above
20. One Pascal is equal to how many PSI
 - a. 0.00375
 - b. 0.0039
 - c. 1.101
 - d. 0.000145 *
21. One feet per minute is equal to how many knots
 - a. 35.52 *
 - b. 52.35
 - c. 66.0
 - d. 76.6
22. One feet per minute is equal to _____ mph
 - a. 0.3034
 - b. 0.01136 *
 - c. 0.0453
 - d. None of above
23. One feet per minute is equal to _____ metres per minute
 - a. 0.3048 *
 - b. 11.36
 - c. 0.9845
 - d. None of above
24. One KMPH is equal to _____ feet per minute
 - a. 98.9
 - b. 49.4
 - c. 24.7
 - d. 54.68 *
25. One KMPH is equal to how many knots
 - a. 0.5396 *
 - b. 0.3569
 - c. 0.6935
 - d. 0.9536
26. One KMPH is equal to _____ miles per hour
 - a. 0.135
 - b. 0.6214 *
 - c. 0.9542
 - d. 0.2614

CHAPTER - 2

KNOWLEDGE OF ATMOSPHERE

1. Standard atmospheric pressure at mean sea level is
 - a. 29.921 of Hg
 - b. 14.7 PSI
 - c. 1013.25 mB
 - d. All of above are correct *
2. The lower most layer which extends to a height of 36,090 ft is known as
 - a. Stratosphere
 - b. Troposphere *
 - c. Ionosphere
 - d. Stratopause
3. The layer extending above tropopause is called
 - a. Stratosphere *
 - b. Troposphere
 - c. Ionosphere
 - d. Stratopause
4. The boundary layer between troposphere and stratosphere is called
 - a. Stratopause *
 - b. Tropopause
 - c. Ozonsphere
 - d. Exosphere.
5. As we go higher and higher atmospheric pressure will
 - a. Increase
 - b. Decrease *
 - c. Remain constant
 - d. Pressure has got no relation with height
6. As altitude increases the atmospheric pressure will
 - a. Decrease *
 - b. Decrease and remain constant above certain height
 - c. Increase
 - d. Not change with altitude
7. The rate at which the temperature falls with increase in altitude is known as
 - a. Temperature rate
 - b. Lapse rate *
 - c. ICAO Temperature rate
 - d. None of above
8. Which of the following statement is correct
 - a. Temperature increase 1.98°C per 1000' increase in altitude
 - b. Temperature decrease at the rate of 1.98°C per 1000' increase in altitude *
 - c. Temperature decrease at the rate of 1.98°C per 1000' decrease in altitude
 - d. Temperature has no relation with altitude
9. Above 36,090 feet the temperature remains constant at
 - a. +56.5°C
 - b. -56.5°C *
 - c. -65.5°C
 - d. None of above correct
10. An increase in static air pressure effects air density by
 - a. Decreasing the density
 - b. Does not effect the density
 - c. Increasing the density *
 - d. None of the above
11. A decrease in temperature affects the air density by
 - a. Decreasing the density
 - b. Does not affect the density
 - c. Increasing the density *
 - d. None of the above
12. Lowest layer of atmosphere is called
 - a. Troposphere *
 - b. Stratosphere
 - c. Tropopause
 - d. Ionosphere
13. Troposphere of equator extends up to the height of
 - a. 60.70 miles
 - b. 36,000 ft
 - c. 28,000 ft *
 - d. above 70 miles
14. Standard sea level pressure is
 - a. 26.921" of hg
 - b. 1013.25 milibar *
 - c. 10.13 lbf/in
 - d. 28.15" of hg
15. Standard sea level temperature is
 - a. 30°C
 - b. 15°C *
 - c. 15°F
 - d. 30°F
16. As per assumption of ICAN / ICAO, temp lapse rate is
 - a. 2.98°C/500 feet
 - b. 1.98°C/1000 feet *
 - c. 1.98°C/2000 feet
 - d. 2.98°C/1000 feet
17. As per the standard atmospheric assumption, temp at 36,090 feet height will be.
 - a. 15°C
 - b. 56.5°C
 - c. -56.5°C *
 - d. -15°C



CHAPTER : 3

DETAILED KNOWLEDGE OF OHM'S LAW, KIRCHOFF'S LAWS AND ELECTROMAGNETIC INDUCTION, THEIR APPLICABILITY IN THE AIRCRAFT INDUSTRY

- The maximum number of electrons in any orbit will not exceed
 - 18
 - 32 *
 - 36
 - 46
- The electrons in the outer - most orbit experience a very weak force of attraction because :
 - Force varies inversely as the square of the distance between two charges
 - The presence of a large number of electrons in the intermediate orbits acts as a partial screen between the nucleus and the outermost electrons
 - Both a) and b) are correct *
 - None of the above
- One micro ohm is equal to
 - $10^6 \Omega$
 - $10^3 \Omega$
 - $10^{-3} \Omega$
 - $10^{-6} \Omega$ *
- If one meter of a copper wire has a resistance of .04 Ω , then 50 meters of that wire will have a resistance of
 - 4 Ω
 - 0.4 Ω
 - 2 Ω *
 - 0.2 Ω
- In an electrical circuit the resistance is equal to
 - V/I
 - $I \times V$
 - V^2 / W
 - Both (a) and (c) are correct *
- In an electrical circuit the current is equal to
 - $V \times R$
 - W/V *
 - $\sqrt{(W \times R)}$
 - V^2 / W
- In an electrical circuit the voltage is equal to
 - W/I^2
 - $\sqrt{(W / R)}$
 - W / I *
 - $\sqrt{(W \times R)}$
- If a resistor is to dissipate energy at the rate of 250 W, what will be its resistance for a terminal voltage of 100 V
 - 10 Ω
 - 20 Ω
 - 2.5 Ω
 - 40 Ω *
- When two resistance are connected in series, the
 - same voltage drop will be there across each of them
 - same current passes through them
 - voltage drop across them will be different
 - Both (b) and (c) are correct *
- When two resistance are connected in parallel then
 - Potential difference across each resistance is different
 - Current passes through each resistance is same
 - Potential difference across each resistance is same*
 - Both a) and b) are correct
- Kirchoff's first law is known as
 - Power law
 - Voltage law
 - Current law *
 - Law of resistance
- Kirchoff's second law is known as
 - Power law
 - Voltage law *
 - Current law
 - Law of resistance
- From Kirchoff's first law, we come to the conclusion that
 - $\sum I = 0$ *
 - $\sum IR + \sum emf = 0$
 - $I \times R = 0$
 - $IR + emf = 0$
- According to Kirchoff's first law, the incoming current is equal to
 - Double of the outgoing current
 - Half of the outgoing current
 - Outgoing current *
 - Triple of the outgoing current
- In applying Kirchoff's laws to specific problems, as we go from the -ve terminal of a battery to its +ve terminal, there is a
 - Rise in potential *
 - Fall in potential
 - Same potential
 - Zero potential
- In applying Kirchoff's laws to specific problems, if we go through a resistor in the same direction as the current, then there is a :
 - Rise in potential
 - Fall in potential *
 - Same potential
 - Zero potential
- In applying Kirchoff's laws to electrical networks, the direction of current flow may be assumed
 - Clock wise only

- b. Anti clockwise only
 c. Either clockwise or anti - clock wise *
 d. Both in clockwise and anticlockwise
18. Kirchoff's laws are applicable to
 a. AC circuits only
 b. DC circuit only
 c. Both AC and DC circuits *
 d. None of the above
19. In applying Kirchoff's laws to electrical network, if the assumed direction of current is not the actual direction, then on solving the question, this current will found to have a :
 a. Plus sign
 b. Minus sign *
 c. Either plus or minus sign
 d. None of these
20. The force experienced by a N - pole of one weber placed at that point within a magnetic field is known as
 a. magnetic potential b. Field strength *
 c. Permeability d. Flux density.
21. Within a magnetic field the work done in shifting a N - pole of one weber from infinity to that point against the force of magnetic field is known as
 a. Magnetising force b. Magnetic Potential *
 c. Susceptibility d. Permeability
22. The pole strength developed per unit area of a magnetic bar is known as
 a. Magnetic potential
 b. Susceptibility
 c. Intensity of magnetisation *
 d. Permeability
23. The ratio of intensity of magnetisation to the magnetising force is known as
 a. Susceptibility * b. Permeability
 c. Magnetic potential d. Field strength
24. Substances which can be strongly magnetised by a magnetic field is known as
 a. Ferromagnetic substances *
 b. Paramagnetic substances
 c. Diamagnetic substances
 d. Non - magnetic substances
25. Example of a ferromagnetic substance is
 a. Chromium b. Cobalt *
 c. Sodium d. Silver
26. Substances which are only slightly attracted by a magnetic field is known as
 a. Ferromagnetic substances
 b. Paramagnetic substances *
 c. Diamagnetic substances
 d. Non - magnetic substances
27. Example of a paramagnetic substance is
 a. Nickel b. Sodium *
 c. Bismuth d. Zinc
28. Substances which are slightly repelled by magnetic fields are known as
 a. Ferromagnetic substances
 b. Paramagnetic substances
 c. Diamagnetic substances *
 d. Non - magnetic substances
29. Example of a diamagnetic substance is
 a. Alnico b. Nickel
 c. Aluminium d. Zinc *
30. Ferrites are ferromagnetic ceramics which have
 a. High permeability and high hysteresis loss
 b. High permeability and low hysteresis loss
 c. Fairly constant permeability and high hysteresis loss
 d. Fairly constant permeability and low hysteresis loss*
31. Ferrites are ideally suited for
 a. High voltage application
 b. High current application
 c. High frequency application *
 d. All the above
32. The number of ampere - turns required per weber of magnetic flux in the circuit is known as
 a. Magneto motive force
 b. Reluctance *
 c. Permeance
 d. Flux density.
33. The unit of magnetising force is
 a. Henry / metre b. Weber /metre
 c. Ampere / metre * d. Joule / weber
34. The emf induced in a coil depends on
 a. the number of its turns
 b. the change of flux linked with it
 c. the time taken to change the flux
 d. all the above *
35. The direction of the induced emf in a coil may be found with the help of
 a. Flemings left hand rule
 b. Faraday's law
 c. Lenz's law *
 d. Kirchoff's law
36. Induced emf in a coil can be
 a. Induced dynamically only
 b. Induced statically only
 c. Induced either dynamically or statically *
 d. None of the above
37. The statically induced emf can be found in
 a. generator b. battery
 c. inverter d. transformer *

38. Charge on an electron is
 a. $1.602 \times 10^{-19} \text{ C}^*$ b. $1.602 \times 10^{-19} \mu\text{C}$.
 c. $9.107 \times 10^{-31} \text{ C}$. d. $9.107 \times 10^{-25} \text{ C}$.
39. An electron having mass $m \text{ Kg}$ and charge $e \text{ coulomb}$ travels from rest through a potential difference of V volts. It has a kinetic energy of
 a. $mV \text{ joules}$ b. $m eV \text{ joules}$.
 c. $eV \text{ joules}^*$ d. $m/e \text{ joules}$.
40. The flow of electric current in a conductor is due to flow of
 a. electrons * b. protons.
 c. electrons and ions d. charged particles.
41. An electric current is the
 a. random movement of electrons in a conductor.
 b. movement of free electrons predominately in one direction *
 c. pressure difference between two poles.
 d. the power that causes drift of electrons.
42. The particles acting as current carries in a metallic conductor are
 a. electrons and ions. b. only ions.
 c. only electrons * d. protons.
43. In gases the flow of current is due to
 a. electrons only.
 b. positive and negative ions.
 c. electrons and positive ions.
 d. electrons, positive ions and negative ions *
44. Flow of how many electrons per second will produce current of one ampere ?
 a. $6.25 \times 10^{18}^*$ b. 1.602×10^{19}
 c. 6.25×10^8 d. 6.25×10^{19}
45. Ampere-second could be the unit of
 a. emf. b. charge *
 c. power. d. energy.
46. 1 coulomb charge is equal to the charge on
 a. 6.25×10^{12} electrons. b. 6.25×10^{18} atoms.
 c. 6.25×10^{18} electrons * d. 6.25×10^{15} electrons.
47. The charge Q flowing through a conductor carrying current of 1 amperes for t seconds is equal to
 a. $1 \times t \text{ coulombs}^*$ b. $1/t \text{ coulombs}$.
 c. $1/t \text{ A/s}$. d. $t/1 \text{ s/A}$.
48. The minimum requirements for causing flow of current are
 a. a voltage source, a resistor and a switch.
 b. a voltage source and a conductor *
 c. a power source and a bulb.
 d. a voltage source, a conductor, an ammeter and a switch.
49. Which of the following current is considered dangerous for the human body ?
 a. 1 mA. b. 25 mA
 c. 50 mA * d. 0.5 A.
50. The ampere is the current which, if maintained in two straight parallel conductors of infinite length, of negligible circular x-section, and placed 1 m apart in a Vacuum, would produce between these conductors a force of per meter of length.
 a. $2 \times 10^{-7} \text{ N}^*$ b. 1 N
 c. $1 \times 10^{-7} \text{ N}$ d. $2 \times 10^7 \text{ N}$
51. Current velocity through a copper conductor is
 a. nearly $3 \times 10^9 \text{ m/s}$
 b. of the order of few $\mu \text{ m/s}$. *
 c. independent of current strength.
 d. the same as propagation velocity of electric energy.
52. The drift velocity of electrons is
 a. larger than speed of light.
 b. almost equal to speed of light.
 c. equal to speed of light.
 d. very small in comparison to speed of light. *
53. Voltage is a form of
 a. potential energy. * b. kinetic energy.
 c. none of the above
54. 1 volt is equal to
 a. one coulomb per joule.
 b. one joule per coulomb. *
 c. one coulomb per second.
 d. work done in transferring a charge of one coulomb.
55. Electric pressure is also called the
 a. resistance b. voltage *
 c. power d. energy.
56. Resistance of human body is about
 a. 10Ω . b. 100Ω .
 c. $1,000 \Omega$. * d. $10,000 \Omega$.
57. The ratio of voltage and electric current in a closed circuit.
 a. remains constant. * b. varies.
 c. increases. d. falls.
58. If in a circuit the voltage is reduced to half and resistance is doubled, the current will become
 a. four times. b. double.
 c. a quarter. * d. half.
59. The condition for the validity under Ohm's law is that the
 a. temperature should remain constant. *
 b. current should be proportional to voltage.
 c. resistance must be wire wound type.
 d. all of the above.
60. The curve representing Ohm's law is
 a. sine function. b. linear. *
 c. a parabola. d. a hyperbola.

61. Ohm's law is applicable to
 a. semi-conductors. b. vacuum tubes.
 c. electrolytes. d. carbon resistors.
 e. arc lamps. f. none of these. *
62. A linear resistor is one which obeys
 a. Ampere's law. b. Lenz's law.
 c. Ohm's law. * d. Kirchhoff's law.
63. Which of the following statement is correct regarding resistance ?
 a. The resistance of a conductor is the hindrance by which the conductor opposes the flow of current through it. *
 b. the resistance of wire is independent of the temperature for most of the materials.
 c. The resistance of a wire does not depend upon its material.
 d. None of the above.
64. The resistance of a conductor having length l , area of cross-section a and resistivity ρ is given as
 a. $R = \rho a/l$. b. $\rho l/a$. *
 c. $R = \rho/a$. d. $R = l/a\rho$.
65. Resistance of a wire always increases if
 a. temperature is reduced.
 b. temperature is increased.
 c. number of free electrons available become less. *
 d. number of free electrons available become more.
66. The resistance of wire varies inversely as
 a. area of x-section. * b. length
 c. resistivity d. temperature.
67. The resistance of a conductor increases as its
 a. length decreases.
 b. resistivity decreases.
 c. x-sectional area decreases. *
 d. length is reduced and x-sectional area is increased.
68. For a fixed supply voltage the current flowing through a conductor will increase when its
 a. area of x-section is reduced.
 b. length is reduced. *
 c. length is increased.
 d. length is increased and x-sectional area is reduced.
69. Two wires A and B of the same material and length l and $2l$ have radius r and $2r$ respectively. The ratio of their specific resistance will be.
 a. $1 : 1$. * b. $1 : 2$.
 c. $1 : 4$. d. $1 : 8$.
70. The electrical conductivity of metals is typically of the order of (in $\text{ohm}^{-1} \text{m}^{-1}$)
 a. 10^7 * b. 10^5
 c. 10^4 d. 10^6
71. Pure metals generally have
 a. high conductivity and low temperature coefficient.
 b. high conductivity and large temperature coefficient*
 c. low conductivity and zero temperature coefficient.
 d. low conductivity and high temperature coefficient.
72. There are two wires A and B. A is 20 times longer than B. If the resistance of B is 1Ω , the resistance of conductor A will be
 a. 40Ω . b. $1/40 \Omega$.
 c. 20Ω . * d. 10Ω .
73. The diameter of wire is reduced to one half, keeping the length constant. The new resistance will be
 a. half of the original.
 b. 4 times of the original. *
 c. double of the original.
 d. one-fourth of the original.
74. A cylindrical metal rod has resistance of $R \Omega$. It is now reformed to three times its original length, keeping the volume constant. The new resistance will be
 a. $R/9$. b. $R/3$.
 c. $9 R$. * d. $3 R$.
75. The wire is stretched to its double the length. The new resistance will be
 a. 4-times the original resistance. *
 b. double the original resistance.
 c. half the original resistance.
 d. one-fourth of the original resistance.
76. A length of wire having a resistance of 1Ω is cut into four equal parts and these four parts are bundled together side by side to form a wire.
 The new resistance will be
 a. $1/4 \Omega$ b. $1/16 \Omega$. *
 c. 4Ω . d. 16Ω .
77. The resistance between the opposite faces of 1m cube is found to be 1Ω . If its length is increased to 2m , with its volume remaining the same, then its resistance between the opposite faces along its length is
 a. 2Ω . b. 4Ω . *
 c. 1Ω . d. 8Ω .
 e. $1/2 \Omega$.
78. A wire of length l and of circular cross section of radius r has a resistance of R ohms. Another wire of same material and of x-sectional radius $2r$ will have the same resistance R if the length is
 a. $2l$. b. $1/2l$.
 c. $4l$. * d. l^2 .
79. If the diameter of the wire is halved its current carrying will become about
 a. one-fourth. * b. half.
 c. twice. d. four-times.
80. Specific resistance of a conductor depends upon
 a. dimensions of the conductor.
 b. composition of conductor material. *

100. A series arrangement of n identical resistors is changed into a parallel arrangement. The new total resistance will become of original resistance.
 a. $1/n$. b. $1/n^2$ *
 c. $1/n^3$. d. $1/n^4$.
101. The resistance of a parallel circuit consisting of two resistors is $12\ \Omega$. One of the resistance wire breaks and the effective resistance becomes $18\ \Omega$. The resistance of the broken wire is
 a. $48\ \Omega$. b. $18\ \Omega$.
 c. $36\ \Omega$ * d. $24\ \Omega$.
102. When one leg of a parallel circuit gets opened out, the current drawn from the supply will
 a. reduce. * b. increase.
 c. remain the same.
- 103.

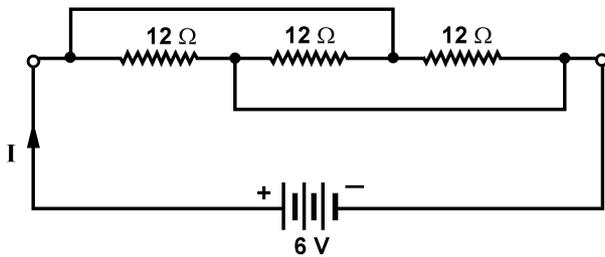


Fig. 1.2

For the circuit shown above (Fig. 1.2) the equivalent resistance will be

- a. $36\ \Omega$. b. $12\ \Omega$.
 c. $4\ \Omega$. d. $6\ \Omega$ *.
104. For the circuit shown for Q. 103, the current flowing through the circuit will be
 a. $1.5\ \text{A}$. b. $1.0\ \text{A}$ *
 c. $0.5\ \text{A}$. d. $0.75\ \text{A}$.
105. Which of the following statements is TRUE both for a series, as well as a parallel circuit ?
 a. Resistance's are additive.
 b. Powers are additive. *
 c. Currents are additive.
 d. Voltage drops are additive.
 e. Conductances are additive.

106. Two resistors R_1 & R_2 give combined resistance of $4.5\ \Omega$ when in series and $1\ \Omega$ when in parallel, the resistances are
 a. $2\ \Omega$ and $2.5\ \Omega$. b. $1\ \Omega$ and $3.5\ \Omega$.
 c. $1.5\ \Omega$ and $3\ \Omega$ * d. $4\ \Omega$ and $0.5\ \Omega$.
107. Three resistors, each of R ohms are connected to form a triangle. The resistance between any two terminals will be
 a. $2/3 R$ ohms. * b. $3/2 R$ ohms.
 c. R ohms. d. $3R$ ohms.

108. Twelve identical wires of resistance $6\ \Omega$ each are arranged to form of edges of a cube. The effective

resistance between the opposite corners of the cube is
 a. $6\ \Omega$ b. $5\ \Omega$ *
 c. $8\ \Omega$ d. $4.5\ \Omega$

109. How are $500\ \Omega$ resistors connected so as to give an effective resistance of $750\ \Omega$?
 a. Three resistors of $500\ \Omega$ each, in series
 b. Two resistors of $500\ \Omega$ each, in parallel
 c. Three resistors of $500\ \Omega$ each, in series
 d. Two resistors of $500\ \Omega$ each, in parallel and the combination in series with another $500\ \Omega$ resistor *
- 110.

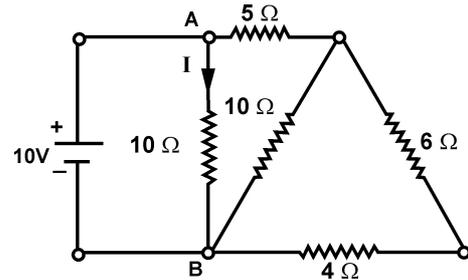


Fig. 1.3

The resistance between points A and B of circuit (Fig. 1.3)

- a. $25\ \Omega$. b. $15\ \Omega$.
 c. $5\ \Omega$ * d. $2.5\ \Omega$.
111. The current I through branch AB of the circuit shown above is
 a. $1\ \text{A}$ * b. $2\ \text{A}$.
 c. $0.5\ \text{A}$. d. $0.25\ \text{A}$.

112. The equivalent resistance of the circuit (Fig. 1.4) is

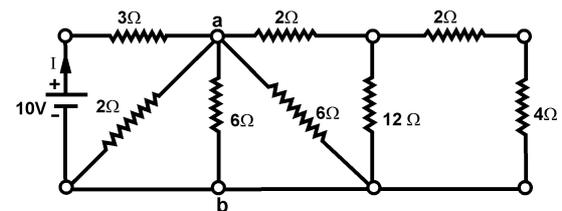


Fig. 1.4

- a. $2\ \Omega$. b. $4\ \Omega$ *
 c. $5\ \Omega$. d. $10\ \Omega$.
113. The current drawn from the battery shown in circuit for Q. 112 is
 a. $1.5\ \text{A}$. b. $2.0\ \text{A}$.
 c. $2.5\ \text{A}$ * d. $5\ \text{A}$.
114. The current flowing through branch AB of the circuit shown for Q. 112 is
 a. $5/12\ \text{A}$ * b. $0.25\ \text{A}$.
 c. $5/6\ \text{A}$. d. $5/3\ \text{A}$.

- 115.

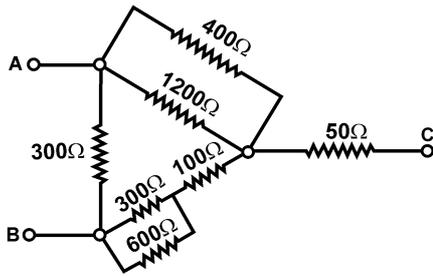


Fig. 1.5

For the circuit shown at (Fig. 1.5) the resistance between points A and C is

- a. 250 Ω.
- b. 350 Ω. *
- c. 200 Ω.
- d. 750 Ω.

116. The resistance between points A and B of the circuit shown in Fig. 1.5 is

- a. 250 Ω.
- b. 350 Ω.
- c. 200 Ω. *
- d. 500 Ω.

117. When all the resistances in the circuit are of 1 Ω each, (Fig. 1.6) the equivalent resistance across the points A and B will be

- a. 1 Ω
- b. 0.5 Ω *
- c. 2 Ω
- d. 1.5 Ω

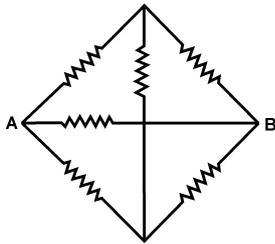


Fig. 1.6

118. A 35-V source is connected to a series circuit of 600Ω and R as shown in Fig. 1.7. If a voltmeter of internal resistance 1.2 kΩ is connected across 600 Ω resistor, it reads 5V. The value of R is

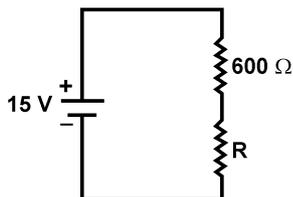


Fig. 1.7

- a. 1.2 kΩ.
- b. 2.4 kΩ. *
- c. 3.6 kΩ.
- d. 7.2 kΩ.

119. When an electric current flows through a conductor, its temperature rises. This is because of

- a. mutual collisions between metal atoms.
- b. mutual collisions between conducting electrons.
- c. collisions between conducting electrons and atoms*
- d. release of conduction electrons from parent atoms.

120. Energy expended or heat generated in joules when a current of 1 ampere flows through a conductor of

resistance R ohms for t seconds is given as

- a. $I^2 Rt$. *
- b. $I Rt$.
- c. $I R^2 t$.
- d. $I Rt^2$.

121. The law that explains the generation of heat due to flow of a current through a conductor is

- a. Ohm's law.
- b. Joule's law. *
- c. Kelvin's law.
- d. Faraday law.

122. Which of the following does not use heating effect of electric current ?

- a. Electric furnace.
- b. Geyser.
- c. Electric iron.
- d. Vacuum cleaner *
- e. Electric oven.
- f. Immersion heater.

123. Which of the following is not equivalent to watts ?

- a. amperes x volts.
- b. (amperes)²x ohm
- c. amperes/volt *
- d. joules per second

124. Which of the following relation is not correct ?

- a. $P = \frac{V}{R} I^2$ *
- b. $P = VI$
- c. $I = \sqrt{\frac{P}{R}}$
- d. \sqrt{PR}

125. Efficiency is defined as the ratio of

- a. input to output.
- b. output to input. *
- c. losses to output.
- d. losses to input.

126. The element of electric heater is made of

- a. copper.
- b. aluminium.
- c. nichrome. *
- d. carbon.

127. When a resistance element of a heater gets fused, we remove a portion of it and reconnect it to the same supply, the power drawn by the heater will

- a. increase. *
- b. decrease.
- c. remain unchanged.

128. A 100 W bulb is connected in series with a room heater. If now 100 W bulb is replaced by a 40 W bulb, the heater output will

- a. increase.
- b. decrease. *
- c. remain the same.

129. The voltage applied across an electric iron is halved. The consumption of the iron will reduce to

- a. one half
- b. three-fourth.
- c. one-fourth. *
- d. 0.707 time.

130. For a given line voltage, four heating coils will produce maximum heat when connected

- a. all in parallel. *
- b. all in series.
- c. two parallel pairs in series.
- d. one pair in parallel with the two in series.

131. Filament lamp makes use of
 a. chemical effect. b. heating effect. *
 c. magnetic effect. d. none of these.
132. Resistance of a 200 W, 250 V lamp will be
 a. 625 Ω . b. 1,250 Ω .
 c. 312.5 Ω . * d. 31.25 Ω .
133. The cold resistance of 100 W, 250 V tungsten lamp will be while cold resistance of tungsten filament lamp is about one-tenth of the hot resistance.
 a. 62.5 Ω . * b. 625 Ω .
 c. 6,250 Ω . d. none of these.
134. Two lamps of 200 W, 220 V, and 100 W, 220 V are connected in series across 220 V supply. The ratio of current through them will be
 a. 1 : 2. b. 1 : 1. *
 c. 2 : 1. d. 1 : 4.
135. A 2 W resistance having current of 2 A will dissipate the power of
 a. 2 W. b. 4 W.
 c. 8 W. * d. 8 J.
136. Two heaters, rated at 1000 W, 250 V each are connected in series across a 250 V, 50 Hz ac mains. The total power drawn from the supply would be ----- W.
 a. 1,000 b. 500 *
 c. 250 d. 2,000
137. For the same voltage, the ratio of resistance of 25 W and 100 W lamps will be
 a. 1 : 1. b. 2 : 1.
 c. 4 : 1. * d. 1 : 4.
138. The ratio of resistance of a 100 W, 220 V lamp to that of a 100 W, 110 V lamp will be, at the respective voltages
 a. 4. * b. 2.
 c. 1/2. d. 1.4.
139. Four 100 W bulbs are connected in parallel across 200 V supply line. If one bulb gets fused
 a. no bulb will light.
 b. all the four bulbs will light.
 c. rest of the three bulbs will light. *
 d. none of the above.
140. A 200 W, 230 V lamp is connected across 155 V supply. The lamp will draw power
 a. slightly more than 50 W. *
 b. slightly less than 50 W.
 c. exactly 100 W.
 d. exactly 50 W.
141. If the voltage across the lamp drops by 1 percent, the power drawn will be reduced by
 a. 1%. b. 2%. *
 c. 4%. d. 0.4%.
142. A 200 W, 100V lamp is to be operated on 250 V supply. The additional resistance required to be connected in series will be.
 a. 125 Ω . b. 50 Ω .
 c. 75 Ω . * d. 25 Ω .
143. The practical unit of electrical energy is
 a. kwh. * b. watt-hour.
 c. watt-second. d. joule-second.
144. SI unit of energy is
 a. watt-hour b. joule. *
 c. kwh. d. calorie.
145. 1 kwh is equal to
 a. 735.5 W. b. 36 x 10⁵ watts.
 c. 36 x 10⁵ joules. * d. 36 x 10⁷ joules.
146. 1 kwh is equal to
 a. 860 Kcal. * b. 36 x 10⁵ ergs.
 c. 4,180 joules. d. 100 watt-hours.
147. A 100 watt light bulb burns on an average of 10 hours a day for one week. The weekly consumption of energy will be ----- unit/s.
 a. 7 * b. 70
 c. 0.7 d. 0.07
148. The electrical energy consumed by an appliance of power rating P watts connected across its rated V for t hours is
 a. Pt kwh. b. Pt/1,000 kwh. *
 c. P/V t kwh. d. Pt/3,600.
149. The electrical energy required to raise the temperature of a given amount of water is 200 kwh. If the heat losses are 20 percent, the total energy required is
 a. 250 kwh. * b. 240 kwh.
 c. 160 kwh. d. none of these.
150. A 1000 W, 240 V electric kettle of heating efficiency 80% is used for raising the temperature of 3.0 liters of water from 20^o C to 100^o C. The time required is
 a. 14 minutes. b. 21 minutes. *
 c. 17 minutes. d. 26 minutes.
151. An ideal voltage source should have
 a. zero source resistance *
 b. infinite source resistance.
 c. terminal voltage in proportion to current.
 d. terminal voltage in proportion to load.
 e. open-circuit voltage nearly equal to voltage on full load.
152. For a voltage source
 a. terminal voltage is equal to the source emf.
 b. terminal voltage cannot exceed source emf. *
 c. terminal voltage is always lower than source emf.
 d. terminal voltage is higher than the source emf.

153. Constant voltage source is
 a. active and bilateral. b. passive and bilateral
 c. active and unilateral. *d. passive and unilateral.
154. An ideal current source has
 a. zero internal conductance. *
 b. zero internal resistance.
 c. zero voltage on no load.
 d. zero ripple.
155. Which of the following statements is incorrect ?
 a. Resistance is a passive element.
 b. Inductor is a passive element.
 c. Current source is a passive element. *
 d. Voltage source is an active element.
156. The terminal across the source are if a current source is to be neglected.
 a. open-circuited. *
 b. short-circuited.
 c. replaced by a capacitor
 d. replaced by a source resistance.
157. The V-I characteristics of an ideal current source is (Ref. Fig. 1.8)

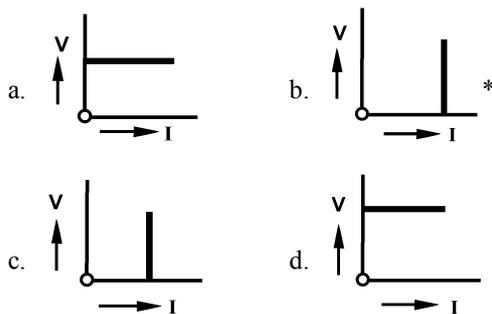


Fig. 1.8

158. Which of the following is an active element in a circuit?
 a. Current source. * b. Resistance.
 c. Inductance. d. Capacitance.
159. Which of the following is not bilateral element ?
 a. Constant current source. *
 b. Resistor.
 c. Inductor.
 d. Capacitor.
160. The circuit having same properties in either direction is known as circuit.
 a. bilateral. * b. unilateral.
 c. irreversible. d. reversible.
161. The elements which are not capable of delivering energy by its own are known as
 a. unilateral element. b. non-linear element.
 c. passive elements. * d. active element.
162. A network having one or more than one source of emf is known as network.
 a. passive. b. active. *
 c. linear. d. non-linear.
163. A circuit having neither any energy source nor emf source is called the circuit.
 a. unilateral b. bilateral.
 c. passive. * d. active.
164. A passive network has
 a. no current source.
 b. no emf source.
 c. only emf source.
 d. neither current source nor emf source. *
165. A terminal where more than two branches meet is known as
 a. node. * b. terminus.
 c. anode. d. none of these.
166. A closed path made by several branches of the networks is known as
 a. circuit b. loop *
 c. junction d. branch
167. If there are b branches and n nodes the number of equations will be
 a. n - 1 b. b
 c. b - n d. b - n + 1 *
168. For determining the polarity of the voltage drop across a resistor, it is necessary to know the
 a. value of resistor
 b. value of current
 c. direction of current flowing through the resistor. *
 d. value of emf in the circuit
169. Kirchoff's laws are valid for
 a. linear circuits only.
 b. passive time invariant circuits.
 c. non-linear circuits only.
 d. both linear and non-linear circuits. *
170. Kirchoff's laws are not applicable to circuits with
 a. distributed parameters *
 b. lumped parameters.
 c. passive elements.
 d. non-linear resistance.
171. Kirchoff's current law is applicable only to
 a. electric circuits.
 b. electronic circuits
 c. junctions in a network *
 d. closed loops in a network
172. Kirchoff's voltage law is concerned with
 a. IR drops b. battery emfs.
 c. junction voltages d. both a. and b. *
173. According to Kirchoff's voltage law, the algebraic sum of all IR drops and emfs in any closed loop of a network is always
 a. negative b. positive
 c. zero *
 d. determined by emfs of the batteries.

174. The algebraic sign of an IR drop primarily depends upon the
 a. direction of flow of current. *
 b. battery connections.
 c. magnitude of current flowing through it.
 d. value of resistance.
175. A simple equivalent circuit of the two terminal network shown in figure 1.9 is

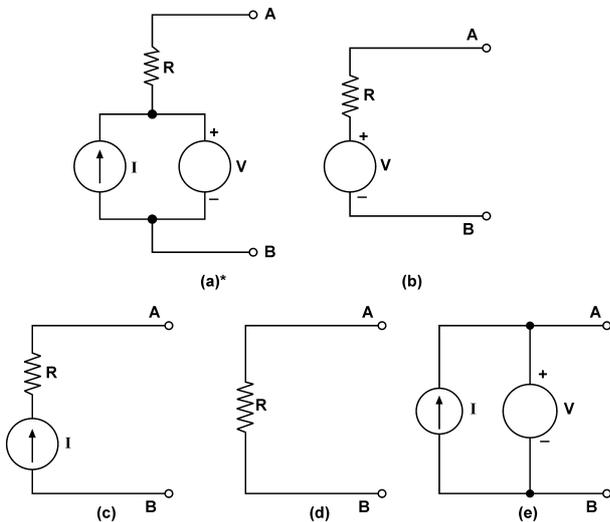


Fig. 1.9

176. In the Wheatstone bridge in fig given (Fig.1.10), if the resistance in each arm is increased by 0.5%, then the value of V_{out} will be

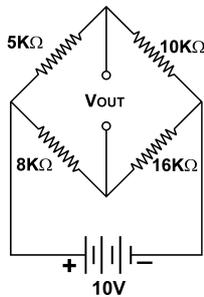


Fig. 1.10

- a. 50mV. b. 5mV.
 c. 0.1 mV. d. zero. *
177. In the circuit shown in the given figure (Fig. 1.11), the current through R_L is

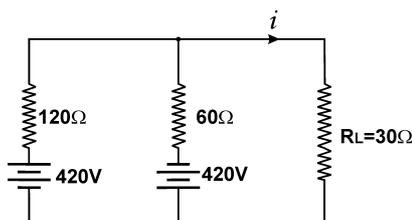


Fig. 1.11

- a. 2 A. b. zero.
 c. - 2 A. * d. - 6 A.

178. Maxwell circulating current theorem
 a. utilises Kirchoff's voltage law. *
 b. utilises Kirchoff's current law.
 c. is a network reduction method.
 d. is confined to single loop circuits.
179. Superposition theorem can be applied only to network.
 a. linear. b. non-linear.
 c. linear bilateral. * d. bilateral.
180. The superposition theorem is essentially based on the concept of
 a. reciprocity. b. linearity. *
 c. duality. d. non-linearity.
181. The superposition theorem is applicable to
 a. current only. b. voltage only.
 c. nodes and sources.
 d. both current and voltage.
 e. current, voltage and power. *
182. The superposition theorem requires as many circuits to be solved as there are
 a. nodes. b. sources. *
 c. nodes and sources. d. meshes.
 e. nodes, sources and meshes.
183. While Thevenizing a circuit between two terminals, V_{TH} is equal to
 a. short-circuit terminal voltage.
 b. open-circuit terminal voltage. *
 c. net voltage available in the circuit.
 d. emf of the battery nearest to the terminals.
184. Thevenin's resistance R_{TH} is determined
 a. by short-circuiting the given two terminals.
 b. by removing the voltage sources along with their internal resistance.
 c. between same open terminals as for V_{TH} . *
 d. between any two open terminals.
185. In Thevenin's theorem Z is determined by
 a. short-circuiting all independent current and voltage sources.
 b. open-circuiting all independent current and voltage sources.
 c. short-circuiting all independent voltage sources and open-circuit all independent current * sources.
 d. open-circuiting all independent voltage sources and short-circuiting all independent current sources.
186. While determining R_{TH} of a circuit
 a. Voltage and current sources should be left as they are
 b. all sources should be replaced by their source resistance. *
 c. all independent current and voltage sources are short-circuited.
 d. none of the above.

187.

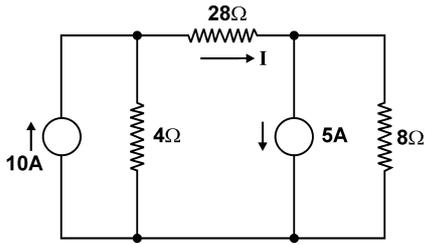


Fig. 1.12

In the circuit shown in the fig 1.12, the current I will be

- a. 1 A.
- b. 2 A. *
- c. 4 A.
- d. 8 A.

188. Which of the following theorems is applicable for both linear and non-linear circuits ?

- a. Superposition.
- b. Thevenizing.
- c. Norton's.
- d. None of these. *

189. Which of the following statements is/are correct ?

- a. Norton's equivalent resistance is the same as Thevenin's equivalent resistance.
- b. Norton's equivalent current is the current equivalent of the work.
- c. The load is connected in parallel to the Norton's equivalent resistance and Norton's equivalent current source.
- d. all of the above. *

190. While determining R_{TH} in Thevenin's and Norton's equivalent

- a. only current sources are made dead. *
- b. only voltage sources are made dead.
- c. all independent source are made dead.
- d. all current and voltage sources are made dead.

191. In the circuit shown in fig 1.13, if $I_1 = 1.5$ A, then I_2 will be

- a. 0.5 A.
- b. 1.0 A.
- c. 1.5 A. *
- d. 3.0 A.

192.

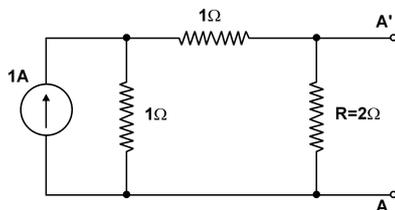


Fig. 1.13

In the Fig 1.13, if we connect a source of 2 V, with internal resistance of 1Ω at A'A, with positive terminals at A', then the current through R is

- a. 2 A.
- b. 1.66 A.
- c. 1.0 A.
- d. 0.625 A. *

193.

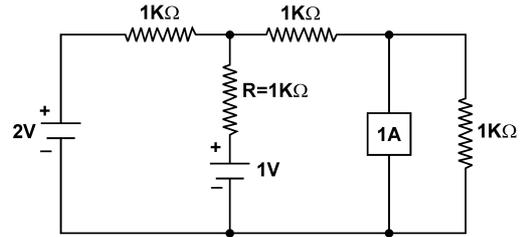


Fig. 1.14

The current in resistor R shown in fig 1.14 will be

- a. 0.2 A. *
- b. 0.4 A.
- c. 0.6 A.
- d. 0.8 A.

194. In the circuit shown in the fig 1.15, the voltage across the 2Ω resistor is

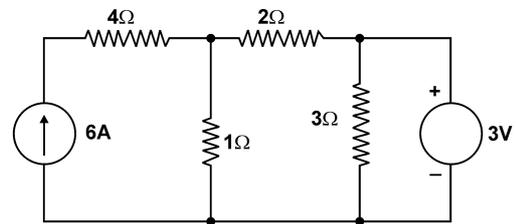


Fig. 1.15

- a. 6 V.
- b. 4 V.
- c. 2 V. *
- d. zero.

195. For maximum transfer of power, internal resistance of the source should be

- a. equal to load resistance.
- b. less than that of load.
- c. more than that of load.
- d. zero. *

196. The maximum efficiency of power transfer to the load is

- a. 25 %.
- b. 50 %. *
- c. 75 %.
- d. 100 %.

197. A voltage source with an internal resistance R_S , supplies power to a load R_L . The power delivered to the load varies with R_L as (Ref. Fig. 1.16)

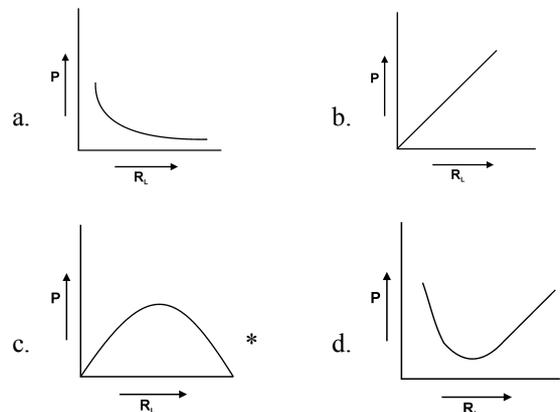


Fig. 1.16

198. If R_g in the circuit shown in the figure 1.17 is variable between 20Ω and 80Ω then the maximum power transfer to the load R_L will be
- 15 W. *
 - 13.33 W.
 - 6.67 W.
 - 2.4 W.

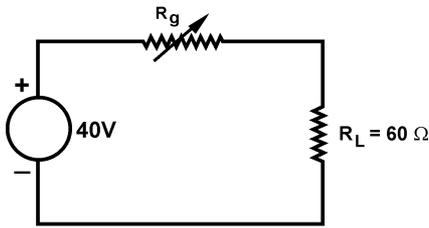


Fig. 1.17

199.

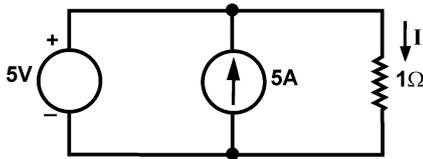


Fig. 1.18

The value of current I flowing in the 1Ω resistor in the circuit shown in the given figure 1.18 will be

- 10 A.
- 6 A.
- 5 A. *
- zero.

200. Viewed from the terminals AB, the following circuit shown in the figure 1.19 can be reduced to an equivalent circuit of a single voltage source in series with a single resistor with the following parameters

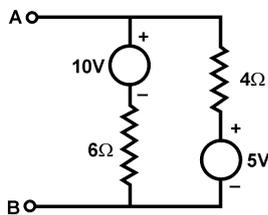


Fig. 1.19

- 5 V source in series with 10Ω resistor.
- 7 V source in series with 2.4Ω resistor. *
- 15 V source in series with 2.4Ω resistor.
- 1 V source in series with 10Ω resistor.

201.

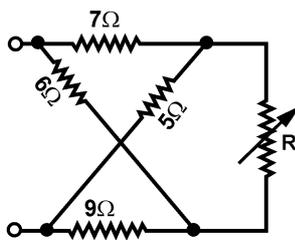


Fig. 1.20

In the lattice network, find the value of R for the maximum power transfer to the load (Ref. Fig. 1.20)

- 5Ω .
- 6.5Ω . *
- 8Ω .
- 9Ω .

202. The Thevenin impedance across the terminals AB of the given network is (Ref. Fig. 1.21)

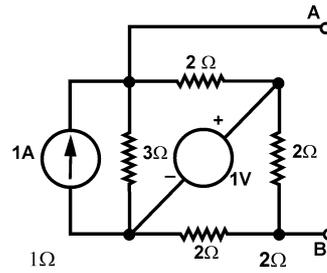


Fig. 1.21

- $10/3 \Omega$.
- $20/9 \Omega$.
- $13/4 \Omega$.
- $11/5 \Omega$. *

203. For a linear network containing generators and impedances, the ratio of the voltage to the current produced in other loop is the same as the ratio of voltage and current obtained if the positions of the voltage source and the ammeter measuring the current are inter changed. The network theorem is known as
- Millman's theorem.
 - Norton's theorem.
 - Tellegen's theorem. *
 - Reciprocity theorem.

204.

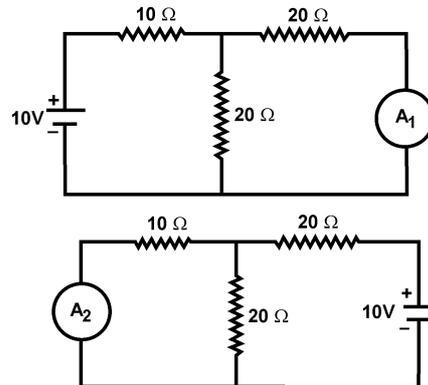


Fig. 1.22

Consider the two circuits I and II shown in the given figures (Ref. fig. 1.22)

Which of the following statements regarding the current flowing statement regarding the current flowing through the ammeters A_1 and A_2 is correct.

- The currents in A_1 and A_2 are of the same value and equals 0.25 A . *
- The currents in A_1 and A_2 are respectively 0.25 A and 2.5 A .
- The current in both the ammeters is of the same value and equals 2.5 A .
- The currents in A_1 and A_2 are respectively 2.5 A and 0.25 A .

205. A Y arrangement of resistances has each branch of equivalent star connection will be

- 9Ω . *
- 6Ω .
- 3Ω .
- 1Ω .

206. The three resistances each of value $3\ \Omega$ are connected in delta. Their value in each branch of equivalent star connection will be
- $9\ \Omega$.
 - $6\ \Omega$.
 - $3\ \Omega$.
 - $1\ \Omega$. *
207. Three equal resistances are connected in star. If this star is converted into equivalent delta
- the resistance of both the networks will be equal.
 - the resistance of the delta networks will be smaller than those of star networks.
 - the resistance of the delta networks will be larger than those of star network. *
208. The nodal analysis is primarily based on the application of
- Ohm's law.
 - Kirchhoff's current law.
 - Kirchhoff's voltage law.
 - both (a) and (b). *
 - both (a) and (c).
209. In the node-voltage technique of solving network, choice of a reference node
- affects the voltages of various nodes. *
 - affects the operation of the circuit.
 - changes the voltage across any element.
 - alters the pd between any pair of nodes.
210. Tellegen's theorem is applicable to
- linear networks only.
 - non-linear networks only.
 - both linear and non-linear networks. *
 - none of the above.
211. Millman's theorem yields equivalent
- impedance or resistance.
 - current source.
 - voltage source.
 - voltage or current source. *
212. The common voltage across parallel branches with different voltage sources can be computed from the relation
- $$V = \frac{V_1}{R_1} + \frac{V_2}{R_2} + \frac{V_3}{R_3}$$
- $$\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$
- The above statement is associated with ----- theorem.
- Thevenin's
 - Millman's* *
 - Norton
 - reciprocity
213. The theorem that enables a number of voltage (or current) sources to be combined directly into a single voltage (or current) source is the ----- theorem.
- compensation
 - reciprocity
 - millman's* *
 - maxwell's
214. Electric battery is a device that
- generates emf by chemical action. *
 - converts heat energy into electrical energy.
 - converts mechanical energy into electrical energy.
 - converts fuel energy into electrical energy.
215. In a primary cell,
- chemical action is reversible.
 - chemical action is irreversible. *
 - chemical action takes place.
 - no chemical action takes place.
216. EMF of a zinc-carbon cell is about
- 1.2 V .
 - 1.5 V . *
 - 1.75 V .
 - 2.2 V .
217. The depolarizer in a carbon zinc cell
- absorbs the oxygen produced in the cell.
 - prevents the fast chemical action on the zinc container.
 - converts the hydrogen produced into water. *
 - all of the above.
218. The internal resistance of a dry cell is about
- $0.2\ \Omega$ to $0.4\ \Omega$. *
 - $0.02\ \Omega$ to $0.04\ \Omega$.
 - $1\ \Omega$ to $2\ \Omega$.
 - $0.1\ \Omega$ to $0.2\ \Omega$.
219. Capacity of a dry cell, is
- more when it supplies current continuously.
 - more when it supplies current intermittently. *
 - not affected by the type of discharge.
 - none of the above.
220. The cell, which is commonly used as standard cell is
- dry cell.
 - solar cell.
 - mercury-cadmium cell. *
 - Zinc-carbon cell.
221. The emf of primary cell depends upon the
- physical dimensions of a cell.
 - nature of electrolyte.
 - nature of electrode.
 - both (b) and (c). *
222. Internal resistance of primary cell varies
- inversely with the distance between electrodes.
 - inversely with the surface area of electrodes.
 - directly with the distance between electrodes.
 - with the nature of electrodes.
 - all of the above except (a). *
223. The internal voltage drop of a voltage source
- is independent of load current supplied.
 - depends upon internal resistance of the source *
 - does not influence the terminal voltage.
 - does affect the emf of the source.
224. A 24 V battery of internal resistance $r = 4\ \Omega$ connected to a variable resistance R . The rate of heat dissipation in the resistor is maximum when the current drawn from the battery is 1. The current drawn from the battery will be $1/2$ when R is equal to
- $8\ \Omega$.
 - $12\ \Omega$. *
 - $16\ \Omega$.
 - $20\ \Omega$.

225. A battery is connected to a resistance causing a current of 0.5 A in the circuit. The current drops to 0.4 A when an additional resistance of $5\ \Omega$ is connected in series. The current will drop to 0.2 A when the resistance is further increased by
- $10\ \Omega$.
 - $15\ \Omega$.
 - $25\ \Omega$. *
 - $40\ \Omega$.
226. A voltage source of emf E volts and internal resistance r ohms will supply, on short circuit, a current of
- E/r amperes. *
 - zero.
 - infinite.
 - $E \times r$ amperes.
227. If the battery has zero internal resistance and external resistance R is gradually reduced in the circuit diagram shown (fig. 1.23), the voltmeter reading will
-
- Fig. 1.23
- decrease.
 - increase.
 - remain constant. *
228. In the circuit diagram shown above if the battery has some definite internal resistance and R is gradually reduced voltmeter reading will
- increase.
 - decrease. *
 - remain unchanged.
229. Cells are connected in series in order to increase the
- current capacity.
 - life of the cells.
 - voltage rating. *
 - terminal voltage.
230. When two batteries of unequal voltages are connected in parallel, the emf of the combination will be equal to the
- emf of the large battery. *
 - emf of the small battery.
 - average of the emf of two batteries.
 - none of the above.
231. When two cells are connected in parallel, it should be ensured that they have
- identical internal resistance.
 - equal emfs. *
 - same make.
 - same ampere-hour capacity.
232. Cells are connected in parallel, it should be ensured that they have
- life of the cells.
 - efficiency.
 - current capacity. *
 - voltage rating.
233. For a group of cells when internal resistance of the group is equal to external load resistance, the group will deliver maximum
- voltage.
 - current. *
 - ampere-hours.
 - efficiency.
234. The arrangement of 12 cells, each of internal resistance $1.5\ \Omega$, to give maximum current in external load resistance of $2\ \Omega$ will be
- all 12 cells in series.
 - all 12 cells in parallel.
 - 4 cells in series with 3 rows in parallel. *
 - 3 cells in series with 4 rows in parallel.
235. The law that finds application in electrolysis is
- Faraday's law. *
 - Coulomb's law.
 - Ohm's law.
 - Lenz's law.
236. During electroplating the weight of a substance deposited depends upon
- shape of the article.
 - quantity of electricity. *
 - room temperature.
 - all of the above.
237. During electro-deposition, the amounts of different substances liberated by same quantity of electricity are proportional to
- atomic weights.
 - valency.
 - chemical equivalents. *
 - atomic numbers.
238. Electric supply for electro-deposition should be
- dc voltage. *
 - low voltage ac.
 - low frequency ac voltage.
 - either (a) or (b).
239. Pickling is
- protection of surface from rusting.
 - a layer coating for preventing surface deterioration.
 - removal of scale, grease etc., from the surface. *
 - none of above.
240. Oil and grease can be removed from a surface with the help of
- soaps.
 - hot alkaline solutions.
 - solvents such as gasoline or carbon tetrachloride.
 - any of the above. *
241. Rust, scales and oxides can be removed from a surface with the help of
- various acids.
 - alkali and salt solutions.
 - mechanical abrasion.
 - electrolytic cleaning.
 - any of the above. *
242. For achieving uniform thickness of deposit on irregular surface
- anode and cathode are kept farther apart. *
 - anode and cathode are kept closer.
 - high current densities are used.
 - electrolyte is agitated constantly.
243. Addition of which of the following substances in electrolyte promotes smooth deposition ?
- Albumen.
 - Glucose.

- c. Phenol. d. Any of these. *
244. Which of the following substances on adding in electrolyte should be
 a. Glycerine. b. Dextrol.
 c. Phenol. d. Any of these *
245. In a lead acid battery, the level of the electrolyte should be
 a. equal to that of the plates.
 b. below the level of plates.
 c. above the level of plates. *
 d. none of the above.
246. In a lead acid battery the energy is stored in the form of
 a. chemical energy. * b. charged ions.
 c. electrostatic charge. d. none of the above.
247. Which of the following statements is incorrect about lead acid batteries ?
 a. The electrolyte is weak sulphuric acid.
 b. When fully charged both of the plates become lead peroxide. *
 c. The number of plates is always odd.
 d. The number of negative plates is one more than the number of positive plates.
248. Which of the following statement is correct about lead acid batteries.
 a. It delivers current as soon as its components are out together.
 b. Density of electrolyte increases while delivering current.
 c. It does not deliver current on putting its components together until it is supplied electrical energy from an external source. *
 d. It has lead as positive plates.
249. During discharging of lead acid cells, the terminal voltage decreases with the decrease in
 a. temperature. b. discharge rate. *
 c. state of charge. d. none of these.
250. In a battery, cover is placed over the elements and sealed at the top of the battery container. This is done in order to
 a. exclude dirt and foreign matter from the electrolyte.
 b. reduce evaporation of water from electrolyte.
 c. both (a) and (b). * d. none of above.
251. Petroleum jelly is applied to the terminals of the lead acid battery in order to prevent
 a. corrosion. * b. local heating.
 c. short-circuiting. d. all of these.
252. For keeping the lead acid battery terminals free from corrosion it is advisable to
 a. keep electrolyte level low.
 b. apply petroleum jelly. *
 c. charge the battery at frequent intervals.
253. In a lead acid battery, separators are provided to
 a. reduce internal resistance.
 b. facilitate flow of the current.
 c. avoid internal short-circuits. *
 d. increase the energy efficiency.
254. In a lead acid battery, fillers are provided to
 a. facilitate flow of gasses. *
 b. prevent flow of gasses.
 c. recover acid losses through vapours.
 d. reduce tendency for polarisation.
255. Which of the following tests is performed for ascertaining whether the battery plates are defective or not ?
 a. Specific gravity test. b. High discharge test.
 c. Cadmium test. * d. None of the above.
256. Vent is provided in each lead acid cell to
 a. pour water or electrolyte when needed.
 b. check the electrolyte level.
 c. allow escape out of gases during charging.
 d. all of the above. *
257. Common impurity in a battery electrolyte is
 a. dust particles. b. iron. *
 c. lead crystals. d. sodium chloride.
258. In lead acid batteries, sedimentation occurs due to
 a. idleness for a longer period.
 b. over-charging at slow rate.
 c. over-charging at high rate. *
 d. slow charging at low rate.
259. In a lead acid battery, excessive formation of lead sulphate occurs due to
 a. idleness of battery for a long time.
 b. low level of electrolyte.
 c. persistent undercharging.
 d. all of the above. *
260. Sulphated cells are indicated by the
 a. low specific gravity.
 b. low voltage on discharge.
 c. low capacity.
 d. all of the above. *
261. Charging of a sulphated battery at high rate causes
 a. warping of plates.
 b. boiling of electrolyte owing to gassing.
 c. damage to separators, cell caps, covers and battery due to excessive temperature.
 d. all of the above. *
262. Short-circuiting of a cell may be caused by
 a. buckling of plates.
 b. breakdown of one or more separators.
 c. excessive accumulation of sediments at the bottom of the cell.
 d. lead particles forming short circuits between positive and negative plates.
 e. any of the above. *

282. The phenomenon of an uncharged body getting charged merely by nearness of a charged body is called the
 a. induction. * b. attraction.
 c. magnetic effect. d. chemical effect.
283. When an uncharged body is placed near a charged body, then uncharged body
 a. is attracted first and then charged by induction.
 b. gets charged by induction and then attracted towards the charging body. *
 c. gets charged by conduction.
 d. remains as such.
284. The value of electric field intensity within the field due to a point charge can be determined by
 a. Gauss's law. b. Ampere's law.
 c. Coulomb's law. * d. Maxwell's law.
285. The space surrounding a charge, within which the influence of its charge extends is known as
 a. electric field. * b. magnetic field.
 c. lines of force. d. electric intensity.
286. A region around a stationary electric charge has
 a. electric field. *
 b. magnetic field.
 c. both electric and magnetic fields.
 d. neither electric nor magnetic field.
287. The unit of electric intensity is
 a. J/C. b. N/C. *
 c. V/m. d. C/m².
288. On placing a dielectric in an electric field the field strength
 a. decreases. * b. increases.
 c. remains the same. d. reduces to zero.
289. The electric field intensity between the plates of a parallel plate condenser is E. Now if a dielectric of medium of dielectric constant ϵ is introduced between the plates, the electric field intensity will become
 a. ϵE b. E/ϵ *
 c. $\sqrt{\epsilon E}$ d. $\sqrt{E/\epsilon}$
290. Inside a hollow conducting sphere
 a. electric field is zero. *
 b. electric field is a non-zero constant.
 c. electric field changes with the magnitude of the charge given to the conductor.
 d. electric field changes with distance from the centre of the sphere.
291. Electric field inside a hollow metallic charged sphere is
 a. zero. *
 b. decreasing towards centre.
 c. increasing towards centre.
 d. none of the above.
292. The electric field inside a perfectly conducting media is
 a. infinite.
 b. zero. *
 c. dependent upon the value of the charge.
 d. none of the above.
293. An infinite number of charges, each equal to 'Q' are placed along the axis at $x=1, x=2, x=3, \dots$ and so on. The electric field at the point $x=0$ due to these charges will be
 a. Q. b. $2Q/3$
 c. $4Q/3$. * d. $\frac{4}{5}Q$.
294. In above question, the electric field at point $x=0$, when the alternate charges are of opposite nature, will be
 a. $4Q/3$. b. $4Q/5$. *
 c. $1.5Q$. d. $3Q$.
295. The electric field intensity at a point situated at a distance d from a straight charged conductor is proportional to
 a. d. b. d^2
 c. $1/d$. * d. $1/d^2$.
- 296.

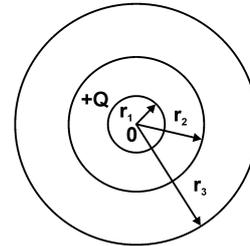


Fig. 1.24

A small isolated conducting sphere of radius r_1 is charged with $+Q$ coulombs. Surrounding this sphere and concentric with it is a conducting spherical shell, which possesses no net charge. The inner radius of the shell is r_2 and outer radius r_3 . All non-conducting space is air. The electric field distribution from 0 to r_1 will be (Ref. Fig. 1.24)

- a. same. b. zero. *
 c. increase. d. decrease.
297. In Q 296 the electric field from r_1 to r_2 will be
 a. zero. b. same.
 c. decreasing. * d. increasing.
298. In Q 296, the electric field from r_2 to r_3 will be
 a. zero. * b. same.
 c. decreasing. d. increasing.

299. Two positive charges, Q coulombs each are placed at points $(0,0,0)$ and $(2,2,0)$ while two negative charges, Q coulombs each in magnitude, are placed at points $(0,2,0)$ and $(2,0,0)$. The electric field intensity at the point $(1,1,0)$ is

- a. zero. *
- b. $Q/8 \pi \epsilon_0$.
- c. $Q/4 \pi \epsilon_0$.
- d. $Q/16 \pi \epsilon_0$.

300. In the figure (1.25), A, B and C are equal charges, when a unit charge moves from 'C' to '0' the force on the charge when it reaches at 0.

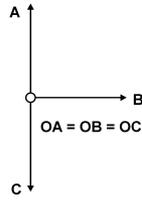


Fig. 1.25

- a. will be zero.
- b. a pull in the direction of A.
- c. a pull in the direction of B.
- d. none of the above. *

301. A spherical conductor of radius 'a' with charge 'q' is placed concentrically inside an uncharged and unearthen spherical conducting shell of inner and outer radii r_1 and r_2 respectively. Taking potential to be zero at infinity, the potential any point within the shell ($r_1 < r < r_2$) will be (Ref. Fig. 1.26)

- a. $q/4 \pi \epsilon_0 r$ *
- b. $q/4 \pi \epsilon_0 a$
- c. $q/4 \pi \epsilon_0 r_2$.
- d. $q/4 \pi \epsilon_0 r_1$.

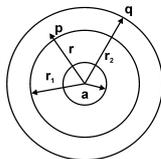


Fig. 1.26

302. The surface integral of the electrical field intensity is the

- a. net flux emanating from the surface. *
- b. electric charge.
- c. charge density.
- d. flux density.

303. For any medium, electric flux density D and electric intensity E are related as.

- a. $D = \epsilon_0 E$.
- b. E/ϵ_0 .
- c. $D = \epsilon_0 \epsilon_r E$ *
- d. $E/\epsilon_0 \epsilon_r$.

304. The unit of polarization is the same as that of

- a. electric flux density D. *
- b. electric intensity E.
- c. charge.
- d. dielectric flux.

305. Which of the following equation (s) is/are correct ?

- a. $\vec{J} = \sigma \vec{E}$.
- b. $\vec{\nabla} \cdot \vec{V} = \vec{E}$.
- c. $\vec{D} = \epsilon \vec{E}$.
- d. all of these. *

306. The relation between electric polarization and susceptibility indicates that the electric polarization is

- a. independent of susceptibility.
- b. inversely proportional to susceptibility.
- c. proportional to square root of susceptibility.
- d. proportional to susceptibility. *

307. The polarization of a dielectric material is given by

- a. $P = \epsilon_r E$.
- b. $P = (\epsilon_r - 1) E$.
- c. $P = \epsilon_0 E (\epsilon_r - 1)$ *
- d. $P = (\epsilon_r - 1) \epsilon_0$.

308.

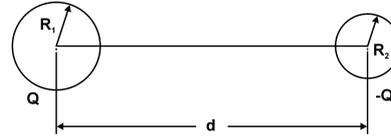


Fig. 1.27

Two circular rings carry equal and opposite charges as shown in the given figure. The dipole moment of the charge distribution is (Reg. Fig. 1.27)

- a. $Q \frac{R_2}{R_1} d$.
- b. $\frac{R_1}{R_2} d$.
- c. $Q \frac{R_1^2 - R_2^2}{d}$
- d. Qd. *

309. For a perfect conductor

- a. $D_n = p_s$ *
- b. $D_n = 0$.
- c. $D_r = \alpha$.
- d. none of these.

310. $\Delta D = \pi$ is based on

- a. Ampere's law.
- b. Gauss's law. *
- c. Faraday's law.
- d. Coulomb's law.

311. "The total electric flux through any closed surface surrounding charges is equal to the amount of charges enclosed".

- a. Maxwell's law.
- b. Ampere's law.
- c. Gauss's law. *
- d. Coulomb's law.

312. The potential inside a charged hollow sphere is

- a. zero.
- b. same as that on the surface. *
- c. less than that on the surface.
- d. none of the above.

313. Two sphere of radii r_1 and r_2 are connected by a conducting wire. Each of the spheres has been given a charge Q. Now

- a. larger sphere will have greater potential.
- b. larger sphere will have smaller potential.
- c. both of the spheres will have zero potential. *
- d. smaller sphere will have zero potential.

314. Potential of a sphere is given as

- a. $Q/4 \pi \epsilon_0 r$ *
- b. $Q/\pi \epsilon_0 r$.
- c. $Q/4 \pi \epsilon_0 r^2$.
- d. $Q^2/4 \pi \epsilon_0 r^2$.

315. Voltage applied across a glass dielectric produces an electric field 10 times of that of air. The dielectric constant for glass is

- a. 0.1
- b. 10 *
- c. 100
- d. 0.01

- a. zero.
- b. $Q/4 \pi \epsilon_0 R^2$ *
- c. $Q/8 \pi \epsilon_0 R^2$
- d. $Q/16 \pi \epsilon_0 R^2$

316. Which of the following is a scalar quantity ?
- a. Electric field strength.
 - b. Electric displacement density.
 - c. Electric potential. *
 - d. Force.

322. The electric potential due to an electric dipole of length l at a point distance r away from it will be doubled if the
- a. length l of the dipole is doubled. *
 - b. r is doubled.
 - c. r is halved.
 - d. l is halved.

317. The relation between electric intensity E , voltage applied V and distance d between the plates of a parallel plate condenser is
- a. $E=V/d$. *
 - b. $E=V \times d$.
 - c. $E=V/d^2$.
 - d. $E=V \times d^2$.

323.

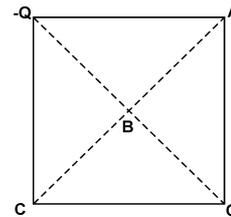


Fig. 1.30

318. If $E = 0$ at all points on a closed surface,
1. The electric flux through the surface is zero.
 2. The total charge enclosed by the surface is zero.
 3. The charge resides on the surface.
- a. 1 & 2 only are correct.
 - b. 2 & 3 only are correct.
 - c. 1 & 3 only are correct.
 - d. 1,2 & 3 are correct. *

Two point charges Q and $-Q$ are located on two opposite corners of a square as shown in the figure (1.30) If the potential at the corner A is taken as $1 V$, then the potential at B , the centre of the square will be

319. Across the surface of a charged conductor, the electric
- a. field is continuous.
 - b. potential is discontinuous.
 - c. field is discontinuous. *
 - d. none of the above.

- a. zero.
- b. $\frac{1}{\sqrt{2}} V$.
- c. $1V$. *
- d. $\sqrt{2} V$.

320.

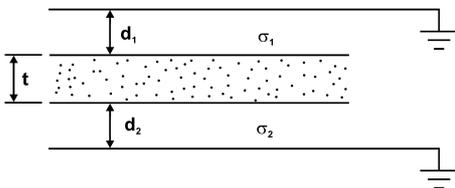


Fig. 1.28

An infinite charged conducting plate is placed between and parallel to two infinite conducting grounded plates as shown in Fig. 1.28. The ratio of charge densities σ and σ_2 on the two sides of the plates will be

324. For a quadrupole electric potential varies as
- a. r .
 - b. $1/r$.
 - c. $1/r^2$.
 - d. $1/r^3$ *
325. In a uniform electric field, field lines and equipotentials
- a. are parallel to one another. *
 - b. intersect at 45° .
 - c. intersect at 30° .
 - d. are orthogonal.

- a. $\frac{(d_1 + t)}{(d_2 + t)}$
- b. $\frac{(d_2 + t)}{(d_1 + t)}$
- c. $\frac{d_2}{d_1}$ *
- d. $\frac{d_1}{d_2}$

326.

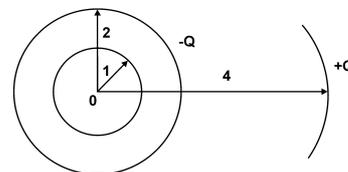


Fig. 1.31

An infinite number of concentric rings carry a charge Q each alternately positive and negative. Their radii are $1, 2, 4, 8, \dots$ meters in geometric progression as shown (Fig. 1.31). The potential at the centre of the rings will be

321. Two concentric spherical shells carry equal and opposite uniformly distributed charges over their surfaces as shown in the figure 1.29. Electric field on the surface of the inner shell will be

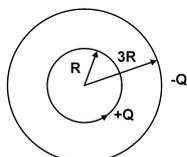


Fig. 1.29

- a. zero.
- b. $Q/12 \pi \epsilon_0$.
- c. $Q/8 \pi \epsilon_0$.
- d. $Q/6 \pi \epsilon_0$ *

327. A sphere of radii $1m$ can attain a maximum potential of
- a. $3 \times 10^6 V$. *
 - b. $30KV$.
 - c. $1,000V$.
 - d. $3KV$.

328. The relation between the breakdown voltage V and the thickness of the dielectric is given as $V=At^{2/3}$ where A is a constant which depends on the nature and thickness of the medium. This statement is known as
 a. Coulomb's law. * b. Baur's law.
 c. Gauss's law. d. none of these.
329. During dielectric breakdown of a capacitor
 a. permanent conduction path is established between capacitor plates. *
 b. electrons are scattered.
 c. electrons ceases to move from one plate to another.
 d. none of the above.
330. Dielectric strength of a material depends on
 a. temperature.
 b. thickness.
 c. moisture content.
 d. all of these. *
331. Dielectric strength of a medium
 a. increases with the increase in temperature.
 b. decreases with the increases in thickness. *
 c. increases with moisture content.
 d. is not affected by the moisture content.
332. A medium behaves like dielectric when the
 a. displacement current is just equal to the conduction current.
 b. displacement current is less than the conduction current.
 c. displacement current is much greater than the conduction current. *
 d. displacement current is almost negligible.
333. The dissipation factor of good dielectric is of the order of
 a. 0.0002 b. 0.002*
 c. 0.02 d. 0.1
334. In Q 296
 a. the potential from 0 to r_1 remains constant.
 b. the potential at a distance r_2 in comparison so that of at r_1 will be less.
 c. the potential distribution from r_2 to r_3 remains constant.
 d. all of the above. *
335. A parallel plate capacitor consists of two circular plates each of radius R . At a certain instant, the capacitor carries a current i . A closed cylindrical surface is drawn centrally as shown in the Fig.1.32. The conduction current leaving the closed surface is
 a. zero. * b. i
 c. $i/2$. d. $3i/4$

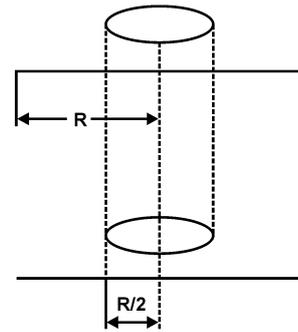


Fig. 1.32

336. If a charge of P_s is there on a conductor at a dielectric conductor interface then normal displacement density at dielectric will be
 a. p_s . * b. zero.
 c. p_s/ϵ . d. infinite.
337. In two parallel conducting plates, each of area A and having charge density p_s , the force of attraction between them will be
 a. $\frac{1}{2\epsilon} p_s^2 A^3$. * b. $\frac{1E^2}{2\epsilon} A$.
 c. $\frac{1}{2\epsilon} p_s^2$. d. $\frac{1}{2} p_s^2$.
338. Polarization of dielectric materials result in
 a. production of eddy currents.
 b. creation of dielectric dipoles. *
 c. release of protons.
 d. absorption of electrons.
339. Which of the following statement(s) is/are valid in case of conductors in electrostatic fields ?
 a. The surface of a conductor is an equipotential surface.
 b. The electric field intensity inside a conductor is zero.
 c. The electric field intensity at the surface of a conductor is everywhere directed normal to that surface.
 d. All of the above. *

340.

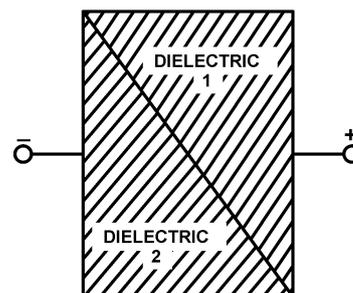


Fig. 1.33

374. Consider the following statements associated with parallel plate capacitor.
1. Capacitance is proportional to area.
 2. Capacitance is inversely proportional to distance of separation of plates.
 3. The dielectric material is in a state of compression.
- Of these statements
- a. 1, 2 and 3 are correct. *
 - b. 1 and 2 are correct.
 - c. 1 and 3 are correct.
 - d. 2 and 3 are correct.

375. The capacitance of a parallel plate capacitor is not affected by
- a. area of plates.
 - b. thickness of plates. *
 - c. separation between plates.
 - d. nature of dielectric.

376. In a parallel plate capacitor, a dielectric slab is introduced. Then the
- a. pd between the plates will decrease.
 - b. electric intensity will decrease.
 - c. capacitance will increase.
 - d. all of the above. *

377. In a parallel capacitor of capacitance C and electric field E if a mica slab ($\epsilon_0=6$) is introduced to fill capacitor completely then the new capacitance and electric field will be
- a. $6C$ and $6E$.
 - b. $C/6$ and $6E$.
 - c. $6C$ and $E/6$. *
 - d. $C/6$ and $E/6$.

378.

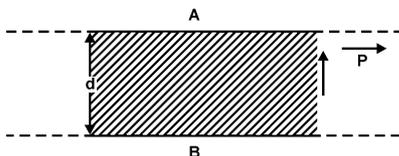


Fig. 1.37

The potential difference between the faces A and B of uniformly polarized infinite slab shown in the figure (1.37) is

- a. $Pd/\epsilon_0 (\epsilon_r - 1)$ *
 - b. $Pd/\epsilon_0 - \epsilon_1$
 - c. Pd/ϵ_0
 - d. $(\epsilon_r + 1)/\epsilon_0$
379. A parallel plate capacitor has air as dielectric. The pd between two plates of the capacitor is 200 V. If a dielectric of dielectric constant 5 is now introduced fully between the plates then the voltage across the capacitor
- a. becomes 40 volts. *
 - b. becomes 1,000 volts.
 - c. becomes 5,000 volts.
 - d. remains 200 volts as before.
380. A parallel plate capacitor has capacitance of $10 \mu\text{F}$. If the linear dimensions of the plates are doubled and the separation between them is also doubled the value of the capacitor would be
- a. $10 \mu\text{F}$.
 - b. $20 \mu\text{F}$. *

- c. $5 \mu\text{F}$.
- d. $40 \mu\text{F}$.

381. If a slab of bakelite ($\epsilon_r=4$) of thickness 4 mm is inserted between the plates of an air capacitor with plate separation of 6 mm the new capacitance will be
- a. halved.
 - b. the same.
 - c. doubled. *
 - d. reduced.

382. A parallel plate air capacitor has plates of $1,500 \text{ cm}^2$ separated by 5 mm. If a layer of dielectric 2 mm thick and relative permittivity 3 is now introduced between the plates, then the new separation in mm between the plates, so that the capacitance value is unchanged, will be
- a. 7.00
 - b. 6.33 *
 - c. 5.67
 - d. 5.00.

383. A parallel plate capacitor with air dielectric is connected to a constant voltage source. The force between its plates is F . If the capacitor is immersed in a liquid of dielectric constant ϵ without disconnecting it from the power supply, then the force between the plates would be
- a. $\epsilon^2 F$.
 - b. ϵF . *
 - c. F
 - d. F/ϵ .

384. A parallel plate capacitor with air an dielectric is charged and then disconnected from the supply. The force between the plates is F . If the capacitor is now immersed in a liquid of dielectric constant ϵ , then the force between the plates will be
- a. $\epsilon^2 F$.
 - b. ϵF .
 - c. F
 - d. F/ϵ . *

385. The capacitance of a cylindrical capacitor is given as

- a. $\frac{\epsilon_0 \epsilon_1}{\log_e \frac{D}{d}} F/m$
- b. $\frac{2\pi \epsilon_0 \epsilon_1}{\log_e \frac{D}{d}} F/m$ *
- c. $\frac{2\pi \epsilon_0 \epsilon_1}{\log_e \frac{D}{d}} F/m$
- d. $\frac{2\pi}{\epsilon_0 \epsilon_1 \log_e \frac{D}{d}} F/m$

386. In a cable capacitor, voltage gradient is maximum at the surface of the
- a. sheath.
 - b. conductor. *
 - c. dielectric.
 - d. earth.

387. Voltage applied across a dielectric produces an electrostatic field 50 times greater than in air. The relative permittivity of the dielectric will be
- a. 50 *
 - b. 5
 - c. 500
 - d. 10

388. Which of the following statements associated with capacitors is wrong ?
- a. A capacitor resists an abrupt change in the voltage across it in a manner analogous to the way a spring resists abrupt change in its displacement.

- b. A capacitor resists an abrupt change in the current flowing through it. *
- c. It is impossible to change the voltage across a capacitor by a finite amount in zero time, for this requires infinite current through the capacitor.
- d. A finite amount of energy can be stored in a capacitor even if the current through the capacitor is zero, such as when the voltage across it is a constant.

389. The time constant of an RC series circuit connected to a dc source is equal to
- a. C/R
 - b. R/C
 - c. CR^*
 - d. J/CR

390.

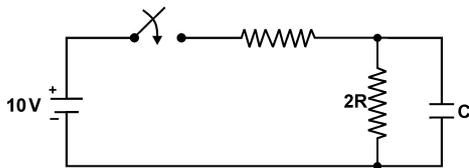


Fig. 1.38

- The time constant of the network shown in fig 1.38 is
- a. $2RC$
 - b. $3RC$
 - c. $RC/2$
 - d. $2RC/3^*$

391.

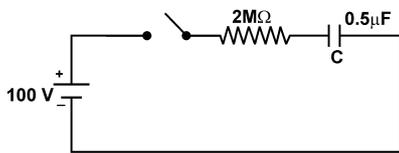


Fig. 1.39

- The voltage across R after $t=0$ and $t=10$ second will be (Ref. Fig. 1.39)
- a. 100V, 63.2V.
 - b. 0V, 63.2V.
 - c. 1000V, 36.8V. *
 - d. 0V, 36.8V.

392. In the series R-C circuit shown in the fig 1.40, the voltage across C starts increasing when the dc source is switched on. The rate of increase of voltage across C at the instant just after the switch is closed. (i.e at $t=0^+$), will be

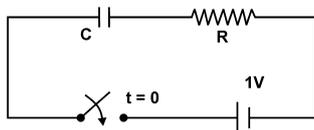


Fig. 1.40

- a. zero.
- b. infinity.
- c. RC .
- d. $1/RC$. *

393. While testing a capacitor with ohmmeter, if the capacitor shows charging but the final resistance reading is appreciably less than normal the capacitor is
- a. leaky. *
 - b. open-circuited.
 - c. short-circuited.
 - d. satisfactory.

394. If an ohmmeter reading immediately goes practically to zero and stays there while checking a capacitor, the capacitor is
- a. leaky.
 - b. short-circuited. *
 - c. open-circuited.
 - d. satisfactory.

395. While checking a good $0.05 \mu F$ capacitor by ohmmeter, its reading will
- a. show high resistance momentarily and then a very low resistance.
 - b. show low resistance momentarily and back off to a very high resistance. *
 - c. show a reading of 80Ω .
 - d. none of the above.

396. A permeable substance is one
- a. through which the magnetic lines of force can pass very easily. *
 - b. which if a strong magnet.
 - c. which if a bad conductor.
 - d. none of the above.

397. The magnetic materials exhibit the property of magnetisation due to
- a. spin of nucleus.
 - b. spin of electrons.
 - c. orbital motion of electrons.
 - d. all of the above. *

398. Consider the following statements: in the case of diamagnetic materials, the magnetic susceptibility is
1. positive.
 2. negative.
 3. independent of temperature.
 4. inversely proportional to temperature. Of these statements:
- a. 1 and 3 are correct.
 - b. 2 and 3 are correct *
 - c. 1 and 4 are correct.
 - d. 2 and 4 are correct.

399. Which of the following statement(s) is/are correct ?
1. Ferromagnetic substances have very large negative values of susceptibility.
 2. Diamagnetic substances have very small negative values of susceptibility.
 3. Paramagnetic substances have very small positive values of susceptibility.
 4. The permeability of diamagnetic substances is slightly greater than unity.

Select the correct answer using the codes given below:

- a. 1 and 4.
- b. 2 and 3. *
- c. 3 and 4.
- d. 4 alone.

400. The magnetic susceptibility of a paramagnetic material is
- a. less than zero.
 - b. less than one but positive *
 - c. greater than one.
 - d. equal to zero.

401. Air exhibits
 a. ferromagnetic. b. paramagnetism. *
 c. antiferromagnetism. d. ferromagnetism.
402. Soft magnetic materials have
 a. high permeability and low coercive force. *
 b. low permeability and high coercive force.
 c. high residual magnetism.
 d. low resistivity.
403. Soft magnetic material is
 a. tungsten steel. b. Alcomax.
 c. bismuth. d. iron. *
404. The material commonly used for shielding or screening magnetism is
 a. soft iron. * b. brass.
 c. copper. d. aluminium.
405. When the iron piece is magnetised
 a. the free electrons collect at the 'N' pole.
 b. the free electrons collect at the 'S' pole.
 c. various molecules are forced into more definite alignment. *
 d. none of the above.
406. Permanent magnetism is one which
 a. is left in the iron piece after the removal of the magnetic field. *
 b. is produced but the superconductor coils.
 c. is produced by electric current.
 d. is produced by induction.
407. The bar magnet has
 a. monopole moment. b. dipole moment. *
 c. both (a) and (b). d. none of these.
408. A keeper is used for
 a. restoring of lost flux.
 b. amplification of flux.
 c. providing a closed path for the magnetic flux. *
 d. changing the direction of magnetic lines of force.
409. Poles of magnet
 a. cannot be separated. *
 b. can be separated.
 c. can be used separately.
 d. can be separated by breaking it into pieces.
410. The direction of magnetic lines of force is
 a. from south pole to north pole.
 b. from north pole to south pole. *
 c. from one end of magnet to another.
 d. none of the above.
411. When a piece of iron is placed in a magnetic field,
 a. there will be no effect on the magnetic field.
 b. the magnetic lines of force will bend away from the piece.
 c. the magnetic lines of force will bend away from their usual paths so as to pass through the piece. *
 d. none of above.
412. Which of the following statements associated with magnetic field is correct ?
 a. The electric current always produces a magnetic field. *
 b. The electric current produces magnetic field only in presence of a coil.
 c. the electric current produces magnetic field only in presence of an iron core.
 d. Only larger currents produce a magnetic field.
413. According to Coulomb's first law
 a. like poles attract each other.
 b. like poles repel each other. *
 c. there is no force between the poles.
 d. none of the above.
414. Permeability is expressed in
 a. N/m. b. H.
 c. H/m. * d. F/m.
415. The force experienced by a unit north pole at any point is called the
 a. mmf.
 b. magnetic flux strength.
 c. magnetic flux density. *
 d. magnetic potential.
416. A conducting sheet lying in x-y plane has j_x as current density in X-direction, then magnetic flux at the surface is
 a. zero. b. ∞
 c. $H_y = n j_x$ * d. $H_x = j_x$
417. Lines of force
 a. never intersect. *
 b. often intersect.
 c. interest only in special circumstances.
 d. are unpredictable.
418. The tubes of force within the magnetic material are called the
 a. lines of force. b. electric flux.
 c. tubes of induction. * d. susceptibility.
419. The number of lines of force per unit area is measure of
 a. magnetic flux density. *
 b. magnetic field intensity.
 c. mmf.
 d. susceptibility.
420. Magnetic flux density emerging out of a closed surface is
 a. infinite.
 b. zero. *
 c. dependent upon the magnetic movement inside the closed surface.
 d. none of the above.

421. Magnetostriction is a phenomenon whereby the magnetisation of a ferromagnetic material leads to a change in
- relative permeability.
 - physical dimensions. *
 - spontaneous magnetisation.
 - magnetic susceptibility.

422. Which of the following is a vector quantity ?
- Magnetic potential.
 - Susceptibility.
 - Magnetic field intensity. *
 - Magnetic flux density.

423. The ratio of intensity of magnetisation to the magnetizing force or intensity of magnetic field is called the
- susceptibility *
 - flux density
 - mmf
 - magnetic potential

424. The unit of susceptibility is
- tesla.
 - H/m. *
 - J/m.
 - dimensionless.

425. For vacuum susceptibility is
- infinite.
 - unity.
 - zero. *
 - none of these.

426. The direction of magnetic field around a current carrying conductor can be determined by
- cork screw rule.
 - right hand rule.
 - end rule.
 - thumb rule.
 - either (a) or (b). *

427. The polarity of the pole can be determined by
- end rule. *
 - cork screw rule.
 - thumb rule.
 - left hand rule

428.

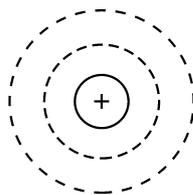


Fig. 1.41

The direction of magnetic flux in a current carrying conductor shown in figure 1.41 is

- upwards.
- downwards.
- clockwise. *
- counter clockwise.

429. The polarity of a solenoid can be determined by
- use of compass needle.
 - helix rule.
 - cork screw rule.
 - either (a) or (b). *

430. Which of the following is derived from Ampere's law?

- $\oint \mathbf{B} \cdot d\mathbf{s} = 0$
- $\oint \mathbf{D} \cdot d\mathbf{s} = \int \rho dV$

c. $\oint \mathbf{H} \cdot d\mathbf{s} = \int \left(\frac{d\mathbf{D}}{dt} + \mathbf{J} \right) \cdot d\mathbf{a}$ *

- d. none of the above.

431. $\nabla \cdot \mathbf{B}$ is based on

- Gauss's law. *
- Ampere's law.
- Faraday's law.
- Ohm's law.

432. The Biot-Savart's law is a general modification of

- Coulomb law.
- Ampere's law. *
- Faraday's law.
- Ohm's law.

433.

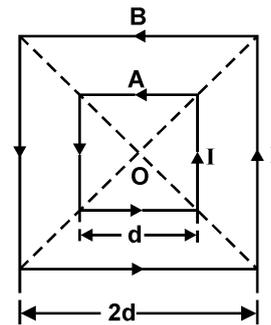


Fig. 1.42

If two concentric square loops A and B shown in the given figure 1.42 carry equal currents in the same sense, then the magnetic field at 'O' due to two loops A and B will be in the ratio

- 1 : $\sqrt{2}$
- 1 : 1
- $\sqrt{2} : 1$
- 2 : 1. *

434. A current I flows through a circular coil of one turn of radius R in the counterclockwise direction. The magnetic
- field at the centre is inversely proportional to R.
 - moment if the coil is directly proportional to R^2 .
 - field at the centre is directly proportional to R^2 .

Of these correct statements are

- 1 & 2 only. *
- 2 & 3 only.
- 1 & 3 only.
- 1, 2 & 3.

435. At the centre of a current carrying single turn circular loop, magnetic field is

- $B = \mu I / 2R$. *
- $\mu I / 2 \pi R$
- $\mu I / 4 \pi R^2$.
- none of these.

436. The flux density B in a ferromagnetic medium of large extent and permeability μ is as shown in the given figure 1.43. Two cavities, cavity 1 shaped like a thin disc and cavity 11 long and needle like are cut. The ratio of H_1 to H_2 for air filled cavities is

- zero. *
- 1
- ∞
- μ / μ_0

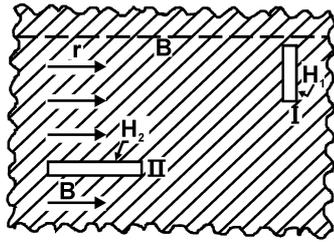


Fig. 1.43

437. Three current carrying conductors are shown in the fig. 1.44. The value of $|\oint \mathbf{B} \cdot d\mathbf{l}|$ around the closed curve C is

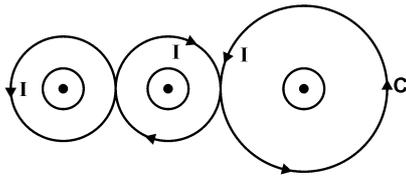


Fig. 1.44

- a. $4\mu_0 I$
- b. $3\mu_0 I$
- c. $2\mu_0 I$
- d. $\mu_0 I$ *

438. A circular current-carrying loop and a field point are shown in the figure 1.45. The vector magnetic potential at P is in the direction of

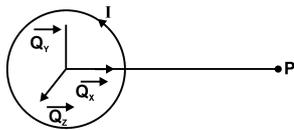


Fig. 1.45

- a. \vec{a}_x
- b. \vec{a}_y *
- c. \vec{a}_z
- d. $(\vec{a}_x + \vec{a}_y)\sqrt{2}$

439. The magnitude of force acting on a current carrying conductor placed in a magnetic field is independent of

- a. flux density.
- b. length of conductor
- c. cross-sectional area of conductor. *
- d. current flowing through the conductor.

440. The direction of mechanical force experienced on a current carrying conductor placed in a magnetic field is determined by

- a. Fleming's left hand rule. *
- b. Fleming's right hand rule.
- c. helix rule.
- d. Cork screw rule.

441. In Fleming's left hand rule thumb always represents direction of

- a. current flow.
- b. induced emf.
- c. magnetic field.
- d. mechanical force. *

442. If a current carrying conductor is placed in a magnetic field, the mechanical force experienced on the conductor

is determined by

- a. simple product.
- b. dot product.
- c. cross product. *
- d. any of these.

443. The force experienced by a current carrying conductor lying parallel to a magnetic field is

- a. zero. *
- b. $B l$
- c. $B l \sin \theta$
- d. $B l \cos \theta$

444. The force experienced by the closed loop of wire carrying current I placed in a uniform magnetic field of flux density as shown in the figure 1.46 given above will be equal to

- a. zero. *
- b. $\mu_0 I r$
- c. $B l / 2\pi r$
- d. $2\pi r B I$

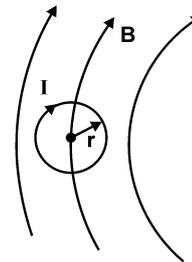


Fig. 1.46

445.

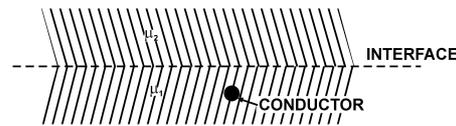


Fig. 1.47

An infinitely long conductor carrying a current is embedded in a semi-infinite medium of permeability μ_1 , as shown in the given figure 1.47. For $\mu_1 > \mu_2$, the conductor will experience

- a. no force
- b. a force that moves it away from the interface.
- c. a force towards the interface. *
- d. a force parallel to the interface.

446. A straight conductor of length l moving with a velocity v in the presence of a magnetic field of flux density B directed at an angle θ with the direction of v experience a force. Which of the following statement(s) is/are true for the magnetic of the force?

1. It is independent of θ .
2. It is proportional to l^2 .
3. It is proportional to B .
4. It is independent of v .

Select the correct answer from the codes given below.

- Codes.
- a. 1, 2 and 3.
 - b. 4 alone.
 - c. 3 alone. *
 - d. 2 and 4.

447. An electric field is parallel but opposite to a magnetic field. Electrons with some initial velocity enter the region of the fields at an angle θ along the direction of the electric field. The electron path will be

- a. straight.
- b. helical.
- c. circular.
- d. elliptical.

448. The force acting on a charge Q moving with velocity v in a region of electric field E and magnetic field B is

- a. zero.
- b. Q .
- c. $Q(E + v \times B)$.
- d. $Q(B + v \times E)$.

449.

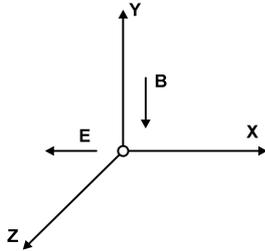


Fig. 1.48

A magnetic field B and electric field E are perpendicular to each other as shown in figure given 1.48. The path of the electrons which start at rest from origin O will be

- a. straight.
- b. circular.
- c. helical.
- d. cycloidal.

450. The magnetic field due to an infinite linear current carrying conductor is

- a. $H = \frac{\mu I}{2\pi r}$ A/m
- b. $H = \frac{I}{2\pi r}$ A/m.
- c. $H = \frac{\mu I}{2r}$ A/m
- d. $H = \frac{I}{r}$ A/m *

451. The magnitude of magnetic field H at a radius of 2.5 m from a long linear conductor is 4 A/m. The current in the wire is

- a. 20 A.
- b. 10 A.
- c. 20π A.
- d. 10π A.

452.

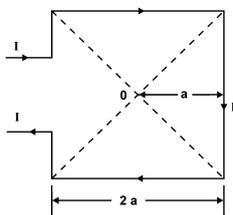


Fig. 1.49

Magnetising force at the centre of a square, each arm of $2a$ meter length, shown fig. 1.49 is given as

- a. $\frac{\sqrt{2}I}{\pi a}$ A/m.
- b. $\frac{I}{\pi a}$ A/m.
- c. $\frac{\pi I}{I}$ A/m.
- d. $\frac{\sqrt{2}\pi I}{a^2}$ A/m.

453. Field strength at the centre of a circular coil of turns N and radius r meter is given as

- a. $H = \frac{NI}{4r}$ A/m
- b. $H = \frac{NI}{2r}$ A/m *
- c. $H = \frac{NI}{4\pi r}$ A/m.
- d. $H = \frac{NI}{2\pi r}$ A/m.

454. The magnetic field intensity (in A/m) at the centre of a circular coil of diameter 1 m and carrying a current of 2 A is

- a. 8
- b. 4
- c. 3
- d. 2π

455. The field at any point on the axis of a current carrying coil will be

- a. perpendicular to the axis.
- b. parallel to the axis.
- c. at an angle of 45° with the axis.
- d. zero.

456. The magnetic flux density at the centre of a 1.5 m long solenoid having 2,500 turns and current 3 A is

- a. π m Wb.
- b. π Wb.
- c. 2π m Wb.
- d. 2π Wb.

457. Which of the following statements is correct ?

- a. The magnetic flux inside the exciting coil is the same as on its outer surface.
- b. The magnetic flux inside an exciting coil is zero.
- c. The magnetic flux inside the exciting coil is greater than that on its outside surface.
- d. The magnetic flux inside the exciting coil is lower than on the outside surface.

458. If the two conductors carry current in opposite direction there will be

- a. a force of attraction between the two conductors.
- b. a force of repulsion between the two conductors*
- c. no force between them.
- d. none of the above.

459. A straight conductor of circular x-section carries a current. Which one of the following statements is true in this regard ?

- a. No force acts on the conductor at any point.
- b. An axial force acts on the conductor tending to increase its length.
- c. A radial force acts towards the axis tending to reduce its cross-section.
- d. A radial force acts away from the axis tending to increase its cross-section.

460. Consider the following statements:

The force per unit length between two stationary parallel wires carrying (steady) currents.

1. is inversely proportional to the separation of wires.
2. is proportional to the magnitude of each current.
3. satisfies Newton's third law.

- Of these statements
- 1 and 2 are correct.
 - 2 and 3 are correct.
 - 1 and 3 are correct.
 - 1, 2 and 3 are correct. *
461. The mmf of magnetic circuit is analogous to
- current.
 - emf. *
 - resistance.
 - power.
462. The unit of reluctance of magnetic circuit is
- AT/m.
 - webers/m.
 - AT/weber. *
 - H/m.
463. The property of a material which opposes the production of magnetic flux in it is known as
- mmf.
 - reluctance. *
 - permeance.
 - permittivity.
464. A coil wound over an iron ring carries certain current and establishes flux in the ring. If the area of x-section of the ring is doubled, the flux density in the core
- is double of the previous value.
 - is half of the previous value.
 - is same as the previous value. *
 - is not possible to predict.
465. The unit of mmf is
- AT. *
 - weber/ampere.
 - Henry.
 - AT/m.
466. Permeability in a magnetic circuit corresponds to in an electric circuit.
- resistivity.
 - conductivity. *
 - permittivity.
 - none of these.
467. Conductance is analogous to
- reluctance.
 - mmf.
 - permeance. *
 - inductance.
468. An air gap is usually inserted in magnetic circuits so as to
- prevent saturation. *
 - increase in mmf.
 - increase in flux.
 - increase in inductance.
469. Permeability is reciprocal of
- reluctivity. *
 - susceptibility.
 - permittivity.
 - conductivity.
470. The magnetic reluctance of a magnetic circuit decreases with the
- decrease in x-sectional area.
 - increase in x-sectional area. *
 - increase in length of magnetic path.
 - decrease in relative permeability of the magnetic material of the circuit.
471. A ring shaped coil with fixed number of turns of it carries a current of certain magnitude. If an iron core is threaded into the coil without any change in coil dimensions, the magnetic induction density will
- increase. *
 - reduce.
 - remain unaffected.
 - unpredictable.
472. The ratio of total flux (flux in the iron path) to useful flux (flux in the air gap) is known as ----- factor.
- utilisation.
 - finding.
 - leakage. *
 - depreciation.
473. A small saw-cut is made in a permanent magnet of toroidal shape. Which of the following field in the air gap and H_0 is that inside the magnet ?
- $H_0 < H_i$
 - $H_0 > H_i$
 - H_0 and H_i are in opposite directions, Select the answer using the codes given below.
- Codes:
- 1 and 3.
 - 1 and 4.
 - 2 and 3. *
 - 2 and 4.
474. $\Delta \times E = -dB/dt$ is derived from
- Ampere's law.
 - Faraday's law. *
 - Gauss's law.
 - none of these.
475. Which of the following is correct ?
- $B = \mu_0 H + M$
 - $B = \mu_0 M + H$
 - $B = \mu_0 (H+M)$ *
 - $B = M / \mu_0$
476. According to Faraday's law of electromagnetic induction an emf is induced in a conductor whenever it
- lies in a magnetic field.
 - lies perpendicular to the magnetic field.
 - cuts the magnetic flux. *
 - moves parallel to the direction of magnetic field.
477. The magnitude of induced emf in a conductor depends upon the
- amount of flux cut.
 - amount of flux linkage.
 - rate of change of flux linkage. *
 - flux density of their magnetic field.
478. "In all cases of electromagnetic induction, an induced voltage will cause a current to flow in a closed circuit in such a direction that the magnetic field which is caused by that current will oppose the change that produces the current", is the original statement of
- Lenz's law. *
 - Faraday's law of magnetic induction.
 - Flemming's law of induction.
 - Ampere's law.
479. The laws of electromagnetic induction (Faraday's and Lenz's laws) are summarized in the following equation.
- $e = iR$
 - $e = L \frac{di}{dt}$
 - $e = - \frac{d\psi}{dt}$ *
 - none of these.

480. Which law is synonymous to the occurrence of diamagnetism?
 a. Ampere's law. b. Maxwell's law.
 c. Coulomb's law. d. Lenz's law. *
481. The emf induced in a coil due to relative motion of a magnet is independent of
 a. coil resistance. *
 b. number of coil turns.
 c. number of coil turns.
 d. pole strength of the magnet.
482. If a copper conductor is moved across a magnetic field.
 a. the wire will become magnetic.
 b. a voltage will be induced in the wire. *
 c. a current will be induced in the wire.
 d. nothing will happen.
483. When a single turn coil rotates in a uniform magnetic field, at uniform speed the induced emf will be
 a. alternating. * b. steady.
 c. pulsating. d. none of these.
484. The principle of dynamically induced emf is utilised in a
 a. choke. b. transformer.
 c. generator. * d. thermo-couple.
485. A minus(-) sign is required to be placed before the right hand side of the expression for emf induced just to indicate the phenomenon explained by
 a. Lenz. * b. Faraday.
 c. Coulomb. d. Flemings.
486. The direction of dynamically induced emf in a conductor can be determined by
 a. Flemming's left hand rule.
 b. Flemming's right hand rule. *
 c. helix rule.
 d. cork screw rule.
487. There is a constant homogeneous magnetic field pointing in a vertical direction. A metallic wire in the form of a square is rotated about a horizontal axis passing through the middle points of its opposite arms. The emf generated in the square is
 a. zero.
 b. finite & constant.
 c. oscillatory. *
 d. varying with time t as t^2 .

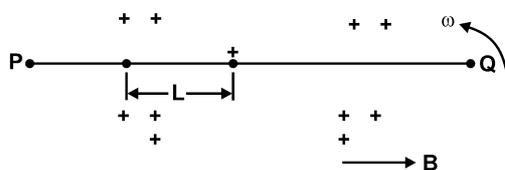


Fig. 1.50

A conducting rod revolves about its mid point O at

uniform angular speed ω in a uniform magnetic field B normal to its plane of revolution as shown in the figure 1.50. The electric pd between the ends P and Q of the rod would be

- a. zero. * b. $B \omega^2 L/2$
 c. $-B \omega^2 L/2$ d. $2 B \omega^2 L$
489. The principle of statically induced emf is utilised in
 a. transformer. * b. motor.
 c. generator. d. battery.
490. The magnitude of statically induced emf depends on the
 a. coil resistance. b. flux magnitude.
 c. rate of change of flux. * d. none of the above.
491. The property of coil by which a counter emf is induced in it, when the current through the coil changes, is called the
 a. self inductance * b. mutual inductance
 c. capacitance d. none of these.
492. The unit(s) of inductance is/are
 a. Henry. b. volt-second/A.
 c. wb/A. d. all of these. *
493. The source of H is
 a. B. b. I . *
 c. Q. d. p.
494. Inductance has the dimensions of
 a. flux/current. * b. flux/length.
 c. (voltage)²/current. d. none of these.
495. If in an iron cored coil the iron core is removed so as to make the air-cored coil, the inductance of the coil will be
 a. more. b. less. *
 c. the same. d. none of these.
496. Lower the self inductance of a coil
 a. more will be the weber-turns.
 b. more will be the emf induced.
 c. lesser the flux produced by it.
 d. smaller the delay in establishing steady current through it. *

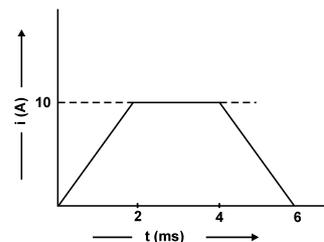


Fig. 1.51

A current shown in the given figure 1.51 passes through a pure inductance of 3 mH. The instantaneous power, in watts, during $0 < t < 2$ ms is

513. The coercive force in a ferro-magnetic material is related to the
- area enclosed by the B-H loop. *
 - intercept on the negative H axis of the B-H loop.
 - intercept on the positive B axis of the B-H loop.
 - maximum value of B on the B-H loop.

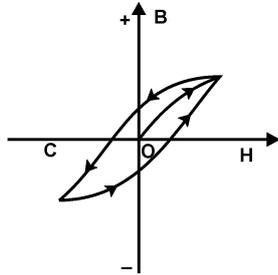


Fig. 1.52

514. The area of hysteresis loss is a measure of
- magnetic flux.
 - permeance.
 - mmf per cycle.
 - energy loss per cycle. *
515. The hysteresis loss is caused by
- structural non-homogeneity.
 - work required for magnetizing the material. *
 - potential work function.
 - none of the above.
516. In a magnetic material, hysteresis loss takes place primarily due to
- rapid reversal of its magnetisation.
 - molecular friction.
 - its high retentivity. *
 - flux density lagging behind magnetizing force.
517. In order to minimize loss due to hysteresis the magnetic material should have
- high retentivity.
 - high resistivity.
 - small B-H loop area. *
 - large coercive force.
 - high hysteresis coefficient.
518. Hysteresis loss is affected minimum by
- frequency.
 - ambient temperature. *
 - volume of material.
 - Steinmetz hysteresis coefficient.
519. Which of the following statements should be true if one compares the hysteresis loops of hard and soft magnetic materials ?
- Hysteresis loss of hard magnetic material will be less than that of soft-material.
 - Coercivity of hard material will be greater than that of soft material.
 - retentivity of two materials will always be equal.
- Select the correct answer using the codes given below

- Codes:
- 1 alone
 - 2 alone *
 - 2 and 3
 - 1, 2 and 3.

520. Area of hysteresis loop represents
- copper loss.
 - eddy current loss.
 - hysteresis loss. *
521. Silicon content in steel reduces
- hysteresis loss. *
 - eddy current loss.
 - copper loss.
522. Hysteresis loss is proportional to
- f^*
 - $f^{1.5}$
 - f^2
 - f^3
523. According to Steinmetz hysteresis law, hysteresis loss in a material is proportional to
- $B^{1.6}$ *
 - $B^{2.6}$
 - B^2
 - B^4
524. The energy stores in the magnetic field of a solenoid 30 cm long and 3cm diameter wound with 1,000 turns of wire carrying current of 10 A is
- 0.015J
 - 0.15 J *
 - 0.5 J
 - 1.15 J
525. Energy density in a static magnetic field is
- $W_M = \frac{1}{2} LI$
 - $W_M = \mu H^2$ *
 - $\frac{1}{2} \mu H^2$
 - $\frac{1}{2} \mu^2 H$
526. Which of the following statements associated with inductors is wrong ?
- An inductor is a sort of short-circuit to dc.
 - An inductor is a sort of open circuit to dc. *
 - An inductor never dissipates energy but only stores it.
 - A finite amount of energy can be stored in an inductor even if voltage across it is zero, such as when the current through it is constant.
527. The kind of magnet that is made by wrapping a coil of fine wire around a steel bar is called the magnet.
- electro- *
 - permanent
 - induced.
 - weak
528. The magnetic field strength of an air-cored coil can be increased by
- increasing the number of turns on the coil.
 - increasing the current strength.
 - increasing the core x-sectional area.
 - inserting a soft iron core into the coil.
 - any of the above methods. *
529. The electro-magnet is made of
- soft iron core.
 - steel core.

- c. soft iron core wrapped in a coil of fine wire with current flowing through it. *
- d. any of the above methods.

530. Core of an electro-magnet should have
- a. low coercivity.
 - b. high susceptibility
 - c. both (a) and (b). *
 - d. none of these.

531.

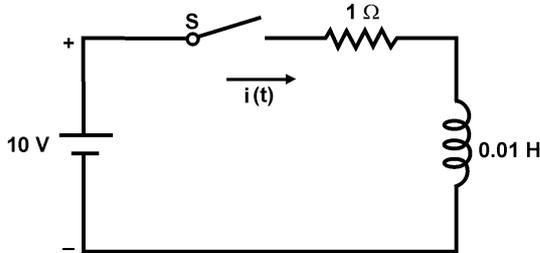


Fig. 1.53

After closing the switch 'S' at $t=0$, the current $i(t)$ at any instant 't' in the network shown in the figure 1.53

- a. $10 + 10 e^{100t}$
- b. $10 - 10 e^{100t}$
- c. $10 + 10 e^{-100t}$
- d. $10 - 10 e^{-100t}$ *

532. When a battery of E volts is suddenly applied across an ideal inductance of L henry, the current through inductance will be

- a. zero.
- b. infinity instantaneously.
- c. increasing linearly at the rate of E/L amperes/s. *
- d. $\frac{E}{L}(1 - e^{-t/T})$.

533. A coil with a certain number of turns has a specified time constant. If the number of turns is doubled, its time constant would.

- a. remain unaffected.
- b. become doubled. *
- c. become four fold.
- d. get halved.

534. At a certain current, the energy stored in an iron-cored coil is 1,000 J and its copper loss is 2,000 W. The time constant (in seconds) of the coil is

- a. 0.25
- b. 0.5
- c. 1.0 *
- d. 2.0

535. A series R-L circuit with $R=100$ ohm; $L=50$ H, is supplied to a dc source of 100 V. The time taken for the current to rise 70 % of its steady state value is

- a. 0.3 s
- b. 0.6 s *
- c. 2.4 s
- d. 70 % of time required to reach steady state.

536. In the circuit shown in the fig 1.54, the switch S is closed at $t=0$. The induced voltage V_2 will have a maximum value of

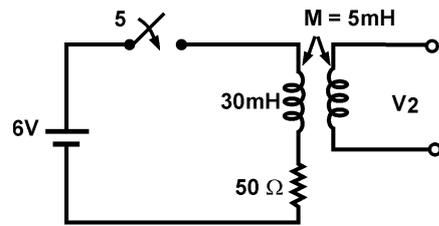


Fig. 1.54

- a. 0.6 V
- b. 1 V *
- c. 3.78 V
- d. 6 V

537. Two coils having equal resistance but different inductance are connected in series. The time constant of the series combination is the

- a. sum of the constant of the individual coils.
- b. average of time constant of the individual coils *
- c. geometric mean of time constants of the individual coils.
- d. product of the time constant of the individual coils.

538.

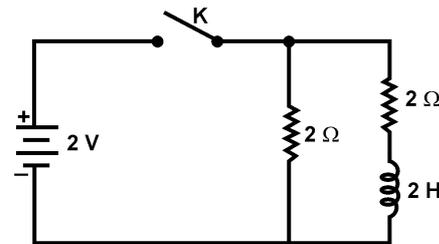


Fig. 1.55

In the network shown in the figure 1.55, the circuit was initially in the steady, state condition with the switch K closed. At the instant when the switch is opened, the rate of decay of current through the inductance will be

- a. zero.
- b. 0.5 A/s
- c. 1 A/s
- d. 2 A/s *

539. In the circuit shown in the figure 1.56, it is desired to have a constant direct current $i(t)$ through the ideal inductor L. The nature of the voltage source $V(t)$ must be

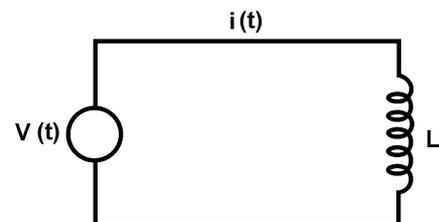


Fig. 1.56

- a. constant voltage.
- b. linearly increasing voltage.
- c. an ideal impulse. *
- d. exponentially increasing voltage.

540. Which of the following inductors will have the least eddy current losses ?
 a. Air cored. * b. iron cored.
 c. Laminated iron cored.
541. The cores in electrical machines are generally made of laminations with a view to reduce
 a. the eddy current loss. *
 b. the hysteresis loss.
 c. the copper loss.
 d. eddy current, hysteresis and copper losses.
542. The phenomenon of production of emf by a thermo-couple when the two junction are kept at different temperatures is known as effect.
 a. Seeback * b. Thomson
 c. Peltier. d. Joule's
543. EMF of a thermocouple depends upon the
 a. nature of material of metals.
 b. difference of temperatures of two junctions.
 c. both (a) and (b) *
 d. none of the above.
544. The absorption or evolution of heat energy, if a current is allowed to flow in a conductor having its different parts at different temperatures is known as effect.
 a. Thomson * b. Seeback
 c. Peltier d. Temperature.
545. In which of the following metals Thomson effect is not present ?
 a. Antimony. b. Cadmium.
 c. Lead. * d. Cobalt.
546. The temperature of hot junction of a thermocouple at which the thermo-emf is maximum is known as
 a. neutral temperature. *
 b. temperature of inversion.
 c. neither (a) nor (b).
547. Neutral temperature of a thermocouple
 a. is constant for a given thermo-couple.
 b. depends upon the nature of the metals of the couple.
 c. is independent of temperature of cold junction of the couple.
 d. all of the above. *
548. Thermo-electro power at neutral temperature is
 a. maximum. b. minimum
 c. zero. * d. unpredictable.
549.coefficient is also known as the specific heat of electricity.
 a. Thomson . * b. Peltier
 c. joules. d. none of these.
550. coefficient is numerically equal to the difference of potential per $^{\circ}\text{C}$
 a. Peltier b. Thomson *
 c. Joule's d. none of these.
551. Thermo-couple is based on
 a. Seeback-effect. * b. Thomson
 c. Joule's d. None of these.
552. As per recommendation of ISI the maximum load that can be connected in one sub-circuit is
 a. 800 watts. * b. 1,000 watts.
 c. 1,600 watts. d. 500 watts.
553. As per recommendation of ISI the maximum number of points of lights fans and socket outlets that can be connected in one subcircuit is
 a. 8 b. 10 *
 c. 15 d. 20
554. The cheapest system of internal wiring is wiring.
 a. cleat * b. casing capping
 c. CTS of TRS d. conduit
555. Highly skilled layout is required in
 a. TRS wiring.
 b. Conduit wiring.
 c. casing-capping wiring.
 d. both conduit and casing-capping wiring. *
556. Which of the following types of wiring is preferred for workshop lighting ?
 a. Casing-Capping wiring.
 b. Batten wiring.
 c. Concealed conduit wiring. *
 d. Surface conduit wiring.
557. Non-metallic conduits used in internal wiring are generally made of
 a. wood. b. rubber.
 c. PVC. * d. cork.
558. PVC conduits can be buried in
 a. plaster. b. lime.
 c. concrete. d. any of these. *
559. PVC conduits can be joined by
 a. welding. b. threading.
 c. solvent cement. d. any of these. *
560. A fuse is provided in an electric circuit for
 a. safeguarding the installation against heavy current. *
 b. reducing the current flowing the circuit.
 c. reducing the power consumption.
 d. all of the above.
561. According to fuse law, the current carrying capacity varies as
 a. diameter b. (diameter)^{1.5} *
 c. (diameter)^{1/2} d. 1/diameter

562. The rating of fuse wire is always expressed in
 a. volts. b. amperes. *
 c. ampere-volts. d. ampere hours.
563. The insulation on a current carrying conductor is provided to prevent
 a. current leakage. b. shock.
 c. both (a) and (b). * d. none of these.
564. The thickness of insulation provided on the conductor depends upon
 a. current rating. b. voltage rating. *
 c. both (a) and (b). d. none of these.
565. When a heater is connected to the power supply, the heater coil will glow but the supply wiring does not glow. This is because
 a. resistance of heater coils is very high in comparison to that of internal wiring. *
 b. internal wiring is of superior material.
 c. the resistance of internal wiring is very high.
 d. supply wires are covered with insulation.
566. Lamps in street lighting are all connected in
 a. series. b. parallel. *
 c. series-parallel. d. end-to-end.
567. Energy meter, for connection, hasterminals.
 a. 2 b. 4 *
 c. 6 d. 8
568. Supplier's fuse, which is provided in domestic wiring system
 a. after the energy meter. *
 b. before the energy meter.
 c. before distribution board.
 d. after main switch.
569. The safety of electrical appliances and wiring is ensured by
 a. insulation.
 b. earthing.
 c. providing a fuse wire in the electric circuit.
 d. all of the above. *
570. The resistance of earth should be
 a. infinite.
 b. high.
 c. low.
 d. the minimum possible. *
571. The earth potential is taken as
 a. zero. * b. that of supply.
 c. infinite. d. none of these.
572. The loop earth wire used shall not be of size less than
 a. 8 SWG. b. 10 SWG.
 c. 16 SWG. d. 20 SWG.
 e. 14 SWG (2.9 mm²) or half of the size of the sub-circuit wire. *
573. Which of the following site will be preferred for earthing ?
 a. Clayey soil.
 b. Dry & rocky.
 c. Wet mashy ground. *
 d. Damp and wet sand pit.
574. Which of the following is least preferred for earthing?
 a. Clayey soil.
 b. Dry & rocky. *
 c. Earth mixed salt and charcoal.
 d. none of the above.
575. Resistivity of earth increases sharply when moisture falls below.
 a. 60 % b. 40 %
 c. 20 % * d. 10 %
576. Earth electrodes can be in the form of
 a. Strip or wire. b. rod.
 c. pipe. d. plate.
 e. any of the above. *
577. Which of the following is not used as earth continuity conductor ?
 a. Gas pipe. *
 b. Water pipe.
 c. Structural steel members.
 d. All of the above.
578. Which of the following mixture is preferred for filling around the earth electrodes for having effective earthing?
 a. Coal-salt mixture. * b. lime-sand mixture.
 c. Sawdust-sand mixture. d. Any of the above.
579. Inside the earth of pit, the earthing electrode should be placed.
 a. horizontally. b. vertically. *
 c. inclined at 45°. d. in any position.
580. The earthing electrodes should be placed within a distance of metres from the building whose installation system is being earthed.
 a. 4.0 b. 2.5 *
 c. 1.5 d. 5.0
581. Third pin in a 3-pin plug is provided so as to
 a. provide an earth connection *
 b. provide a 3-phase supply, when required
 c. provide a spare phase when required
 d. prevent the plug being reversed in socket.
582. List 1 List 2
 (Material) (Range of resistivity)
 A Conductive 1. 10⁰ to 10² Ω-m
 B Semi-conductor materials 2. 10⁻⁸ to 10⁻⁶ Ω-m
 C Insulating materials 3. 10¹² to 10¹⁸ Ω-m
 4. 10²⁰ to 10³⁰ Ω-m

Codes :	A	B	C
a.	2	1	3 *
b.	2	1	4
c.	1	2	3
d.	1	2	4

583. List 1
(Materials)
A Copper
B Silver
C Carbon
D Aluminium

Codes :	A	B	C	D
a.	2	1	3	4
b.	1	2	3	4
c.	2	1	4	3 *
d.	1	2	3	4

584. List 1

A Aluminium
B Manganin
C Carbon

Codes :	A	B	C
a.	1	2	3
b.	2	3	1
c.	3	1	2
d.	2	1	3 *

585. List 1

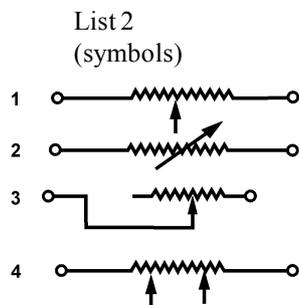
A Brass
B Manganin
C Electrolytes

Codes :	A	B	C
a.	3	2	1 *
b.	1	2	3
c.	2	3	1
d.	3	1	2

586. List 1

A Variable resistor
B Potentiometer
C Tapped resistor
D Rheostat

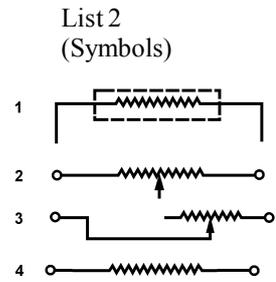
Codes :	A	B	C	D
a.	1	2	3	4
b.	2	1	4	3 *
c.	3	4	1	2
d.	4	1	2	3



587. List 1

A Fixed resistor
B Fusible resistor
C Potentiometer
D Rheostat

Codes :	A	B	C	D
a.	1	2	3	4
b.	2	3	4	1
c.	4	1	2	3 *
d.	3	4	1	2



588. List 1
(name of cell/
accumulator)
A Cadmium cell
B Nickel cadmium
C Nickel-iron accumulator
D Carbon-zinc cell

Codes :	A	B	C	D *
a.	2	3	4	1
b.	1	2	3	4
c.	3	4	1	2
d.	4	3	2	1

- List 2
(Type of cell/accumu-
lator)
1. Primary cell
2. Standard cell
3. Dry storage accu-
mulator
4. Alkaline accumu-
lator

589. List 1
(Name of cell/
accumulator)
A Dry cells
B Lead acid accumulators
C Ni-iron accumulator
D Silver-zinc batteries

Codes :	A	B	C	D
a.	1	2	3	4
b.	4	3	2	1 *
c.	2	3	4	1
d.	3	4	1	2

- List 2
(Applications)
1. Submarine propu-
sion
2. Aircraft
3. Telephone excha-
nges
4. Transistors

590. List 1
(Name of cell)
A Dry cell
B Lead acid cell
C Nickel-iron cell
D Cadmium standard cell
(saturated)

Codes :	A	B	C	D
a.	1	2	3	4
b.	2	3	1	4
c.	2	1	4	3 *
d.	3	4	2	1

- List 2
(Average emf)
1. 2.0V
2. 1.5V
3. 1.0218V
4. 1.2V

591. List 1
Material
A Copper
B Vacuum
C Aluminium
D Nickel
- List 2
Relative permeability
1. 600
2. 1.00002
3. 1.000008
4. 0.999991
- Codes : A B C D
a. 1 2 3 4
b. 2 3 4 1
c. 4 3 1 2
d. 4 3 2 1*

592. List 1
Material/Medium
A Ferromagnetic
B Paramagnetic
C Diamagnetic
D Free space
- List 2
Relative permeability
1. Slightly more than unity
2. Unity
3. Slightly less than unity
4. Very high (from several hundreds to several thousands)
- Codes : A B C D
a. 1 2 3 4
b. 2 3 4 1*
c. 4 1 2 3
d. 3 4 1 2

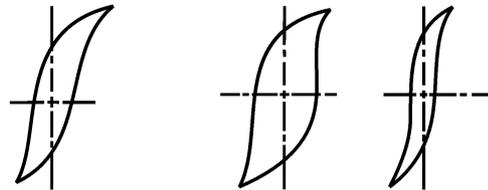
593. A cylindrical rod of magnetic material fits tightly when it is inserted into a long solenoid, half way through. The nature of the force on the rod and the type of material of the rod are listed below. Match list 1 and list 2 and select the correct answer using codes given below the lists:

- List 1
(Material)
A Diamagnetic
B Paramagnetic
C Ferromagnetic
- List 2
(Force)
1. Nil
2. Repulsive
3. Attractive
- Codes : A B C
a. 2 2 3*
b. 1 3 3
c. 2 3 3
d. 3 2 2

594. List 1
(Material)
A Nickel, cobalt, iron steel etc.
B Aluminium, tin platinum etc.
C Silver, lead, zinc, copper etc.
- List 2
(Class of materials)
1. Diamagnetic
2. Ferromagnetic
3. Paramagnetic
- Codes : A B C
a. 1 2 3
b. 3 2 1
c. 2 1 3
d. 2 3 1*

595. List 1
(Material)
A Alnico alloys
B Wrought iron or cast steel
C Silicon alloy and permalloy
- List 2
(Applications)
1. Transformer cores
2. Electro-magnets
3. Permanent Magnets
- Codes : A B C
a. 3 2 1*
b. 1 2 3
c. 2 3 1
d. 3 1 2

596. List 1
(Material)
A Hard steel
B Wrought iron and cast steel
C Alloyed sheet steel
- List 2
(Hysteresis loop)



- Codes : A B C
a. 1 2 3
b. 2 1 3*
c. 2 3 1
d. 3 1 2

597. List 1
(Material)
A Hard steel
B Wrought iron and cast steel
C Alloyed sheet steel
- List 2
(Properties)
1. High permeability and low hysteresis loss
2. High retentivity
3. High magnetic permeability and good retentivity.
- Codes : A B C
a. 1 2 3
b. 3 3 2
c. 2 3 1*
d. 3 2 1

598. List 1
(type of wiring)
A Cleat-wiring
B Casing-capping
C CTS or TRS wiring
- List 2
(fields of applications)
1. Godowns, workshops and public buildings.
2. Residential commercial and office buildings
3. Not in common use now-a-days.

D Conduit wiring	4. Temporary installations			
Codes :	A	B	C	D
a.	1	2	3	4
b.	2	3	4	1
c.	3	1	4	2
d.	4	3	2	1 *

599. List 1
- A Pole fuse
 - B Energy meter
 - C Supplier fuse
 - D Distribution board
 - E Earth wire

- List 2
1. To carry earth fault current
 2. To take many circuits from one
 3. To protect meter
 4. To register energy consumption
 5. To protect service mains

Codes :	A	B	C	D	E
a.	5	4	3	2	1 *
b.	5	4	2	3	1
c.	4	5	3	2	1
d.	5	3	4	2	1
e.	4	5	3	1	2

600. How much power must a 24-volt generator furnish to a system which contains the following loads ?

UNIT	RATING
One motor (75 percent efficient)	1/5 hp
Three position lights	20 watts each
One heating element	5 amp
One anticollision light	3 amp

(Note : 1 horsepower = 746 watts)

- a. 402 watts.
- b. 385 watts.
- c. 450 watts. *

601. A 12-volt electric motor has 1,000 watts input and 1 horsepower output. Maintaining the same efficiency, how much input power will a 24-volt, 1-horsepower electric motor require ?

(Note : 1 horsepower = 746 watts)

- a. 1,000 watts.
- b. 2,000 watts. *
- c. 500 watts.

602. A 1-horsepower, 24-volt dc electric motor that is 80 percent efficient requires 932.5 watts. How much power will a 1-horsepower, 12-volt dc electric motor that is 75 percent efficient require ?

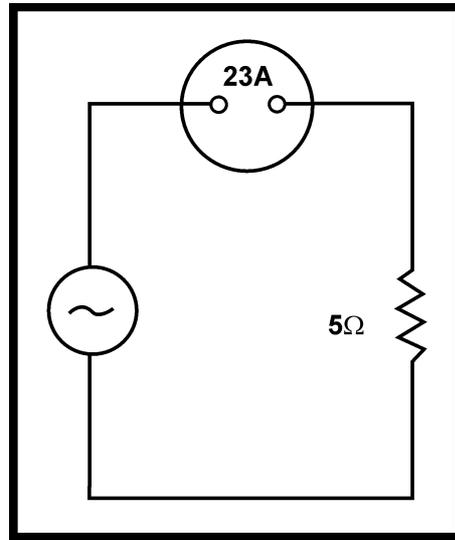
(Note : 1 horsepower = 746 watts)

- a. 932.5 watts.
- b. 1,305.5 watts.
- c. 994.6 watts. *

603. The potential difference between two conductors which are insulated from each other is measured in
- a. volts. *
 - b. amperes.
 - c. coulombs.

604. (Refer to figure 1.57) How much power is being furnished to the circuit ?

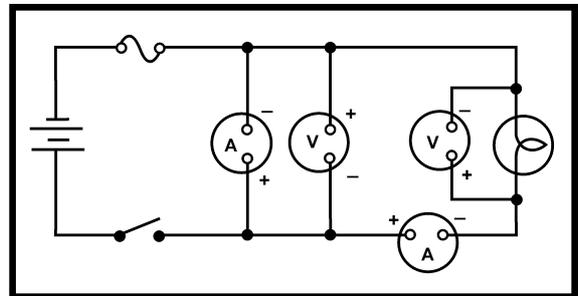
- a. 575 watts.
- b. 2,875 watts.
- c. 2,645 watts. *



Circuit Diagram
Fig. 1.57

605. (Refer to figure 1.58) How many instruments (voltmeters and ammeters) are installed correctly ?

- a. Three.
- b. One.
- c. Two*.



Circuit Diagram.
Fig. 1.58

606. The correct way to connect a test voltmeter in a circuit is
- a. in series with a unit.
 - b. between source voltage and the load.
 - c. in parallel with a unit. *

607. Which term means .001 ampere ?
- a. Microampere.
 - b. Kiloampere.
 - c. Milliampere. *

608. .002 KV equals
- a. 20 volts.
 - b. 2.0 volts. *
 - c. .2 volt.

609. What unit is used to express electrical power ?
- a. Volt.
 - b. Watt. *
 - c. Ampere.

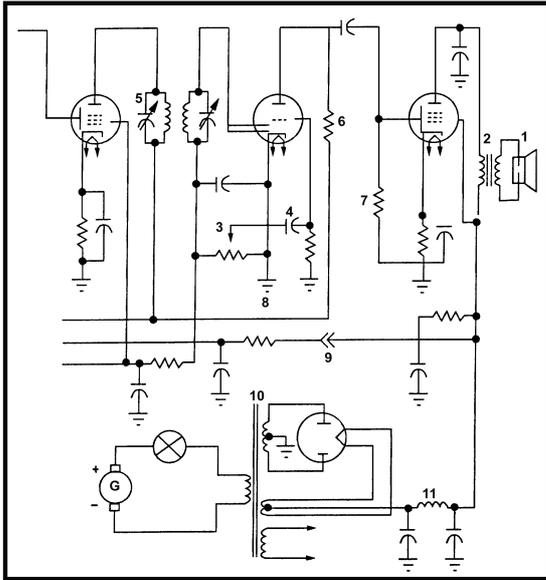


Fig.1.59. Electrical Symbols.

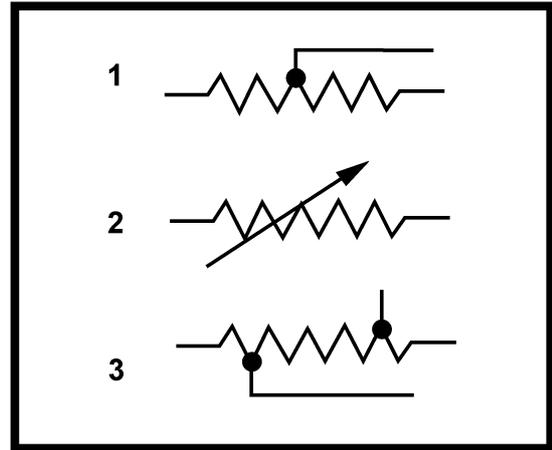


Fig. 1.60. Electrical Symbols.

610. Which of these will cause the resistance of a conductor to decrease ?
- Decrease the length or the cross-sectional area.
 - Decrease the length or increase the cross-sectional area. *
 - Increase the length or decrease the cross-sectional area.
611. Through which material will magnetic lines of force pass the most readily ?
- Copper
 - Iron. *
 - Aluminium.
612. The voltage drop in a conductor of known resistance is dependent on
- the voltage of the circuit.
 - only the resistance of the conductor and does not change with a change in either voltage or amperage.
 - the amperage of the circuit. *
613. A thermal switch, as used in an electric motor, is designed to
- close the integral fan circuit to allow cooling of the motor.
 - open the circuit in order to allow cooling of the motor. *
 - reroute the circuit to ground.
614. (Refer fig. 1.59) Which of the components is a potentiometer ?
- 5.
 3. *
 - 11.
615. (Refer figure to 1.59) The electrical symbol represented at number 5 is a variable
- inductor.
 - resistor.
 - capacitor. *
616. (Refer to figure 1.60) Which symbol represents a variable resistor ?
2. *
 - 1.
 - 3.
617. How much current does a 30 volt motor, 1/2 horsepower, 85 percent efficient draw from the bus ?
(Note : 1 horsepower = 746 watts)
- 14.6 amperes. *
 - 12.4 amperes.
 - 14.1 amperes.
618. Which requires the most electrical power during operation ?
(Note : 1 horsepower = 746 watts)
- A 12-volt motor requiring 8 amperes.
 - Four 30-watt lamps in a 12-volt parallel circuit.
 - Two lights requiring 3 amperes each in a 24-volt parallel system. *
619. How many amperes will a 28-volt generator be required to supply to a circuit containing five lamps in parallel, three of which have a resistance of 6 ohms each and two of which have a resistance of 5 ohms each ?
- 1.11 amperes.
 - 1 ampere.
 - 25.23 amperes. *
620. A 24-volt source is required to furnish 48 watts to a parallel circuit consisting of four resistors of equal value. What is the voltage drop across each resistor ?
- 12 volts.
 - 3 volts.
 - 24 volts. *
621. (Refer to figure 1.61) If resistor R_5 is disconnected at the junction of R_4 and R_3 as shown, what will the ohmmeter read ?

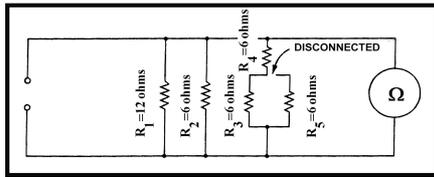


Fig. 1.61. Circuit Diagram.

- a. 2.76 ohms.
- b. 3 ohms. *
- c. 12 ohms.

622. (Refer to figure 1.62) If resistor R_3 is disconnected at terminal D, what will the ohmmeter read ?

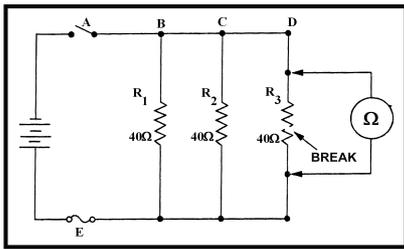


Fig. 1.62. Circuit Diagram.

- a. Infinite resistance. *
- b. 10 ohms.
- c. 20 ohms.

623. (Refer to figure 1.63) With an ohmmeter connected into the circuit as shown, what will the ohmmeter read ?

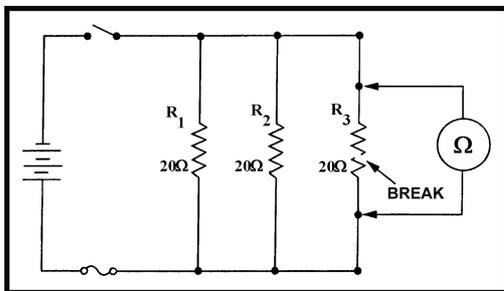


Fig. 1.63. Circuit Diagram.

- a. 20 ohms.
- b. Infinite resistance.
- c. 10 ohms. *

624. A cabin entry of 10 watts and a dome light of 20 watts are connected in parallel to a 30-volt source. If the voltage across the 10-watt light is measured, it will be

- a. equal to the voltage across the 20-watt light. *
- b. half the voltage across the 20-watt light.
- c. one-third of the input voltage.

625. A 14-ohm resistor is to be installed in a series circuit carrying .05 ampere. How much power will the resistor be required to dissipate ?

- a. At least .70 milliwatt.
- b. At least 35 milliwatts. *
- c. Less than .035 watt.

626. (Refer to figure 1.64) What is the measured voltage of the series-parallel circuit between terminals A and B ?

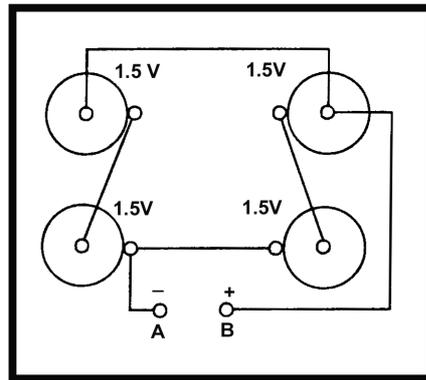
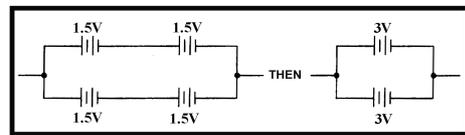


Fig. 1.64. Battery Circuit.



- a. 1.5 volts.
- b. 3.0 volts. *
- c. 4.5 volts.

627. A 24-volt source is required to furnish 48 watts to a parallel circuit consisting of two resistors of equal value. What is the value of each resistor ?

(Note : $R_T = E^2/P$)

- a. 24 ohms. *
- b. 12 ohms.
- c. 6 ohms.

628. Which requires the most electrical power ?

(Note : 1 horsepower = 746 watts)

- a. Four 30-watt lamps arranged in a 12 volt parallel circuit.
- b. A 1/5 horsepower, 24-volt motor which is 75 percent efficient.
- c. A 24-volt anticollision light circuit consisting of two light assemblies which require 3 amperes each during operation. *

629. What is the operating resistance of a 30-watt light bulb designed for a 28-volt system ?

- a. 1.07 ohms.
- b. 26 ohms. *
- c. 0.93 ohm.

630. Which statement is correct when made in reference to a parallel circuit ?

- a. The current is equal in all portions of the circuit.
- b. The total current is equal to the sum of the currents through the individual branches of the circuit. *
- c. The current in amperes can be found by dividing the EMF in volts by the sum of the resistors in ohms.

631. If three resistors of 3 ohms, 5 ohms and 22 ohms are connected in series in a 28-volt circuit, how much current will flow through the 3-ohm resistor ?
 a. 9.3 amperes. b. 1.05 amperes.
 c. 0.93 amperes. *
632. A circuit has an applied voltage of 30 volts and a load consisting of a 10-ohm resistor in series with a 20-ohm resistor. What is the voltage drop across the 10-ohm resistor ?
 a. 10 volts. * b. 20 volts.
 c. 30 volts.

633. (Refer to figure 1.65) Find the total current flowing in the wire between points C and D.
 a. 6.0 amperes.
 b. 2.4 amperes.
 c. 3.0 amperes. *

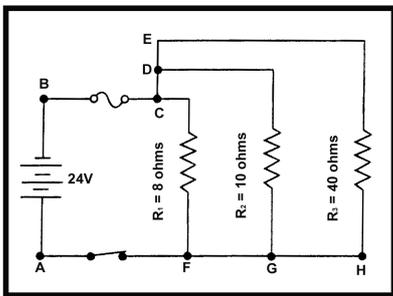


Fig. 1.65. Circuit Diagram.

634. (Refer to figure 1.65) Find the voltage across the 8-ohm resistor.
 a. 8 volts. b. 20.4 volts.
 c. 24 volts. *
635. (Refer to figure 1.66) Find the total resistance of the circuit.
 a. 16 ohms. b. 2.6 ohms.
 c. 21.2 ohms. *

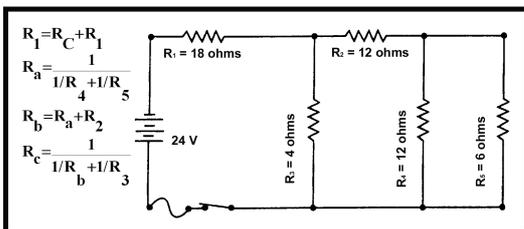


Fig. 1.66. Circuit Diagram.

636. Which is correct in reference to electrical resistance ?
 a. Two electrical devices will have the same combined resistance if they are connected in series as they will have if connected in parallel.
 b. If one of three bulbs in a parallel lighting circuit is removed, the total resistance of the circuit will become greater. *
 c. An electrical device that has a high resistance will use more power than one with a low resistance with the same applied voltage.

637. (Refer to figure 1.67) Determine the total current flow in the circuit.

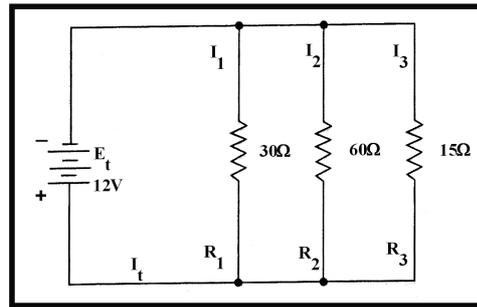


Fig. 1.67. Circuit Diagram.

- a. 0.2 ampere.
 b. 1.4 ampere. *
 c. 0.8 ampere.
638. (Refer to figure 1.68) The total resistance of the circuit is

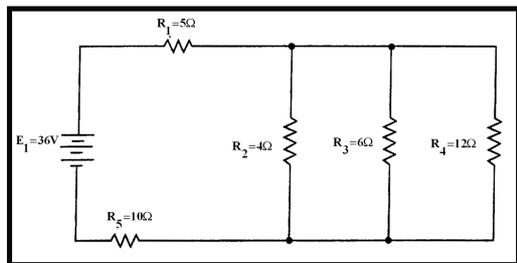


Fig. 1.68 Circuit Diagram.

- a. 25 ohms.
 b. 35 ohms.
 c. 17 ohms. *
639. A 48-volt source is required to furnish 192 watts to a parallel circuit consisting of three resistors of equal value. What is the value of each resistor?
 a. 36 ohms. *
 b. 4 ohms.
 c. 12 ohms.
640. Which is correct concerning a parallel circuit ?
 a. Total resistance will be smaller than the smallest resistor. *
 b. Total resistance will decrease when one of the resistances is removed.
 c. Total voltage drop is the same as the total resistance.
641. A lead-acid battery with 12 cells connected in series (no-load voltage = 2.1 volts per cell) furnishes 10 amperes to a load of 2-ohms resistance. The internal resistance of the battery in this instance is
 a. 0.52 ohm. *
 b. 2.52 ohms.
 c. 5.0 ohms.
642. If electrolyte from a lead-acid battery is spilled in the battery compartment, which procedure should be followed ?

- a. Apply boric acid solution to the affected area followed by a water rinse.
 b. Rinse the affected area thoroughly with clean water.
 c. Apply sodium bicarbonate solution to the affected area followed by a water rinse. *
643. Which statement regarding the hydrometer reading of a lead-acid storage battery electrolyte is true ?
 a. The hydrometer reading does not require a temperature correction if the electrolyte temperature is 80°F. *
 b. A specific gravity correction should be subtracted from the hydrometer reading if the electrolyte temperature is above 20°F.
 c. The hydrometer reading will give a true indication of the capacity of the battery regardless of the electrolyte temperature.
644. A fully charged lead-acid battery will not freeze until extremely low temperatures are reached because
 a. the acid is in the plates, thereby increasing the specific gravity of the solution.
 b. most of the acid is in the solution. *
 c. increased internal resistance generates sufficient heat to prevent freezing.
645. What determines the amount of current which will flow through a battery while it is being charged by a constant voltage source ?
 a. The total plate area of the battery.
 b. The state-of-charge of the battery. *
 c. The ampere-hour capacity of the battery.
646. Which of the following statements is/are generally true regarding the charging of several aircraft batteries together ?
 1. Batteries of different voltages (but similar capacities) can be connected in series with each other across the charger, and charged using the constant current method.
 2. Batteries of different ampere-hour capacity and same voltage can be connected in parallel with each other across the charger, and charged using the constant voltage method.
 3. Batteries of the same voltage and same ampere-hour capacity must be connected in series with each other across the charger, and charged using the constant current method.
 a. 3.
 b. 2 and 3.
 c. 1 and 2. *
647. The method used to rapidly charge a nickel-cadmium battery utilizes
 a. constant current and constant voltage.
 b. constant current and varying voltage.
 c. constant voltage and varying current. *
648. If an aircraft ammeter shows a full charging rate, but the battery remains in a discharged state, the most likely cause is
 a. an externally shorted battery.
 b. an internally shorted battery. *
 c. a shorted generator field circuit.
649. Which condition is an indication of improperly torqued cell link connections of nickel-cadmium battery ?
 a. Light spewing at the cell caps.
 b. Toxic and corrosive deposit of potassium carbonate crystals.
 c. Heat or burn marks on the hardware. *
650. The presence of small amounts of potassium carbonate deposits on the top of nickel-cadmium battery cells that have been in service for a time is an indication of
 a. normal operation. *
 b. excessive gassing.
 c. excessive plate sulfation.
651. The servicing and charging of nickel-cadmium and lead-acid batteries together in the same services area is likely to result in
 a. normal battery service life.
 b. increased explosion and/or fire hazard.
 c. contamination of both types of batteries. *
652. The electrolyte of a nickel-cadmium battery is the lowest when the battery is
 a. being charged.
 b. in a discharged condition. *
 c. under a heavy load condition.
653. The end-of-charge voltage of a 19-cell nickel-cadmium battery, measured while still on charge.
 a. must be 1.2 to 1.3 volts per cell.
 b. must be 1.4 volts per cell.
 c. depends upon its temperature and the method used for charging. *
654. Nickel-cadmium batteries which are stored for a long period of time will show a low liquid level because
 a. of the decrease in the specific gravity of the electrolyte.
 b. electrolyte evaporates through the vents.
 c. electrolyte becomes absorbed into the plates. *
655. How can the state-of-charge of a nickel-cadmium battery be determined ?
 a. By measuring the specific gravity of the electrolyte.
 b. By a measured discharge. *
 c. By the level of the electrolyte.
656. What may result if water is added to a nickel-cadmium battery when it is not fully charged ?
 a. Excessive electrolyte dilution.
 b. Excessive spewing is likely to occur during the charging cycle. *
 c. No adverse effects since water may be added anytime.
657. In nickel-cadmium batteries, a rise in cell temperature
 a. causes an increase in internal resistance.
 b. cause a decrease in internal resistance. *
 c. increases cell voltage.

- 658. When a charging current is applied to a nickle-cadmium battery, the cells emit gas only
 - a. toward the end of the charging cycle. *
 - b. when the electrolyte level is low.
 - c. if they are defective.
- 659. Nickle-cadmium battery cases and drain surfaces which have been affected by electrolyte should be neutralized with a solution of
 - a. boric acid. *
 - b. sodium bicarbonate.
 - c. potassium hydroxide.
- 660. The working voltage of a capacitor in an ac circuit should be
 - a. equal to the highest applied voltage
 - b. at least 20 percent greater than the highest applied voltage
 - c. at least 50 percent greater than the highest applied voltage *
- 661. The term that describes the combined restive forces in an ac circuit is
 - a. resistance.
 - b. reactance.
 - c. impedance. *
- 662. The basis for transformer operation in the use of alternating current is mutual.
 - a. inductance. *
 - b. capacitance.
 - c. reactance.
- 663. The opposition offered by a coil to the flow of alternating current is called (disregard resistance)
 - a. impedence.
 - b. reluctance.
 - c. inductive reactance. *
- 664. An increase in which of the following factors will cause an increase in the inductive reactance of a circuit ?
 - a. Inducatnce and frequency. *
 - b. Resistance and voltage.
 - c. Resistance and capacitive reactance.
- 665. (Refer to figure 1.69) When different rated capacitors are connected in series in a circuit, the total capacitance is
 - a. less than the capacitance of the lowest rated capacitor. *
 - b. greater than the capacitance of the highest rated capacitor.
 - c. equal to the sum of all the capacitances.

$$C_T = \frac{1}{1/C_1 + 1/C_2 + 1/C_3...}$$

Fig. 1.69 Equation.

- 666. In an ac circuit, the effective voltage is
 - a. equal to the maximum instantneous voltage.
 - b. greater then the maximum instantaneous voltage.
 - c. less than the maximum instantaneous voltage. *

- 667. The amount of electricity a capacitor can store is directly proportional to the
 - a. distance between the plates and inversely proportional to the plate area.
 - b. plate area and is not affected by the distance between the plates.
 - c. plate area and inversely proportional to the distance between the plates. *
- 668. (Refer to figure 1.70) What is the total capacitance of a certain circuit containing three capacitor with capacitances of .02 microfarad, .05 microfarad, and .10 microfarad, respectively ?
 - a. 5.88 μF.
 - b. 0.125 pF.
 - c. .0125 μF. *

$$C_T = \frac{1}{1/C_1 + 1/C_2 + 1/C_3}$$

Fig. 1.70. Equation.

- 669. Unless otherwise specified, any values given for current or voltage in an ac circuit are assumed to be
 - a. instantaneous values.
 - b. effective values. *
 - c. maximum values.
- 670. When different rated capacitors are connected in parallel in a circuit, the total capacitance is

(Note : $C_T = C_1 + C_2 + C_3...$)

 - a. less than the capacitance of the lowest rated capacitor.
 - b. equal to the capacitance of the highest rated capacitor.
 - c. equal to the sum of all the capacitances *
- 671. When inductors are connected in series in a circuit, the total inductance is (where the magnetic fields of each do not affect the others)

(Note : $L_T = L_1 + L_2 + L_3...$)

 - a. less than the inductance of the lowest rated inductor.
 - b. equal to the inductance of the highest rated inductor.
 - c. equal to the sum of the individual inductances *
- 672. (Refer to figure 1.71) When more than two indicators of different inductance are connected in parallel in a circuit, the total inductance is
 - a. less than inductance of the lowest rated inductor *
 - b. equal to the inductance of the highest rated inductor.
 - c. equal to the sum of the individual inductances.

$$L_T = \frac{1}{1/L_1 + 1/L_2 + 1/L_3...}$$

Fig. 1.71. Equation.

673. What is the total capacitance of a certain circuit containing three capacitors with capacitances of .25 microfarad, .03 microfarad, and .12 microfarad,
 (Note : $C_T = C_1 + C_2 + C_3$)
 a. .4 μ F. * b. .04 pF.
 c. .04 μ F.
674. When calculating power in a reactive or inductive ac circuit, the true power is
 a. more than the apparent power.
 b. less than the apparent power in a reactive circuit and more than the apparent power in an inductive circuit.
 c. less than the apparent power. *
675. (Refer to figure 1.72) What is the impedance of an ac-series circuit consisting of an inductor with a reactance of 10 ohms, a capacitor with a reactance of 4 ohms, and a resistor with a resistance of 8 ohms ?
 a. 22 ohms.
 b. 5.29 ohms.
 c. 10 ohms. *

$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

Z = Impedance
 R = Resistance
 X_L = Inductance Reactance
 X_C = Capacitive Reactance

Fig. 1.72. Formula.

676. Transfer of electrical energy from one conductor to another without the aid of electrical connections
 a. is called induction. *
 b. is called airgap transfer.
 c. will cause excessive arcing and heat, and as a result is impractical.
677. What happens to the current in a voltage step-up transformer with a ratio of 1 to 4 ?
 a. The current is stepped down by a 1 to 4 ratio. *
 b. The current is stepped up by a 1 to 4 ratio.
 c. The current does not change.
678. Diodes are used in electrical power circuits primarily as
 a. cutout switches. b. rectifiers. *
 c. relays.
679. In a P-N-P transistor application, the solid state device is turned on when the
 a. base is negative with respect to the emitter. *
 b. base is positive with respect to the emitter.
 c. emitter is negative with respect to the base.
680. In an N-P-N transistor application, the solid state device is turned on when the
 a. emitter is positive with respect to the base.
 b. base is negative with respect to the emitter.
 c. base is positive with respect to the emitter. *

681. Typical application for zener diodes is as
 a. full-wave rectifiers. b. half-wave rectifiers.
 c. voltage regulators. *
682. (Refer to figure 1.73) Which illustration is correct concerning bias application and current flow ?

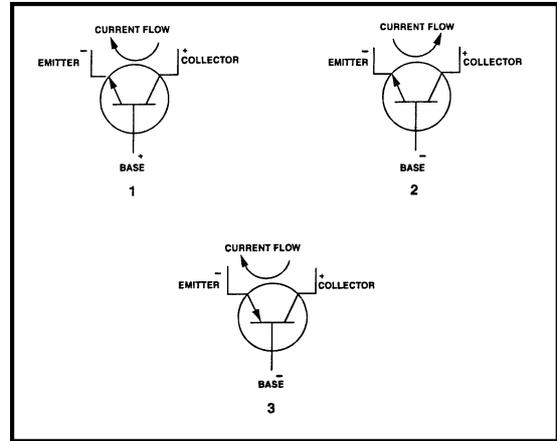


Fig. 1.73. Transistors.

- a. 1. * b. 2.
 c. 3.
683. Forward biasing of a solid state device will cause the device to
 a. conduct via zener breakdown.
 b. conduct. *
 c. turn off.
684. (Refer to figure 1.74) If an open occurs at R_1 , the light

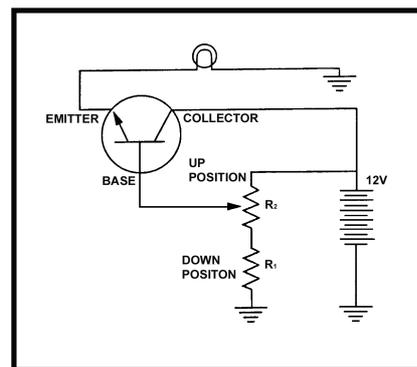


Fig. 1.74. Transistorized Circuit.

- a. cannot be turned on *
 b. will not be affected.
 c. cannot be turned off.
685. (Refer to figure 1.75) If R_2 sticks in the up position, the light will
 a. be on full bright. * b. be very dim.
 c. not illuminate.
686. (Refer to figure 1.75) Which statement concerning the depicted gate is true ?

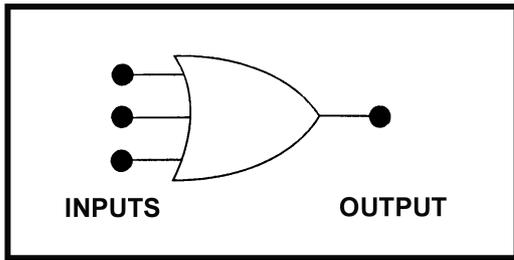


Fig. 1.75 Logic Gate.

- a. Any input being 1 will produce a 0 output.
- b. Any input being 1 will produce a 1 output. *
- c. All inputs must be 1 to produce a 1 output.

687. (Refer to figure 1.76) In a functional and operating circuit, the depicted logic gate's output will be 0

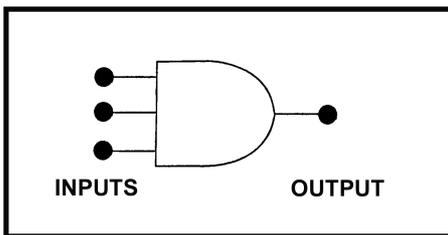


Fig. 1.76 Logic Gate

- a. only when all inputs are 0.
- b. when all inputs are 1.
- c. when one or more inputs are 0. *

688. (Refer to figure 1.77) Which of the logic gate output conditions is correct with respect to the given inputs ?

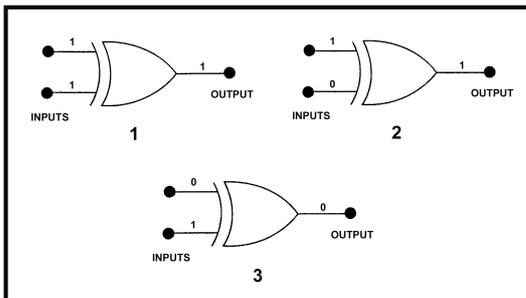


Fig. 1.77 Logic Gates.

- a. 1.
- b. 2. *
- c. 3.

689. (Refer to figure 1.78) With the landing gear retracted, the red indicator light will not come on if an open occurs in wire

- a. number 19. *
- b. number 7.
- c. number 17.

690. (Refer to figure 1.78) The No. 7 wire is used to

- a. complete the PUSH-TO-TEST circuit. *
- b. open the UP indicator light circuit when the landing gear is retracted.

c. close the UP indicator light circuit when the landing gear is retracted.

691. (Refer to figure 1.78) When the landing gear is down, the green light will not come on if an open occurs in wire

- a. number 7.
- b. number 6. *
- c. number 17.

692. (Refer to figure 1.78) What will be the effect if the PCO relay fails to operate when the left-hand tank is selected?

- a. The fuel pressure crossfeed valve will not open.
- b. The fuel tank crossfeed valve open light will illuminate.
- c. The fuel pressure crossfeed valve open light will not illuminate. *

693. (Refer to figure 1.79) The TCO relay will operate if 24-volts dc is applied to the bus and the fuel tank selector is in the

- a. right-hand tank position.
- b. crossfeed position. *
- c. left-hand tank position.

694. (Refer to figure 1.79) With power to the bus and the fuel selector switched to the right-hand tank, how many relays in the system are operating ?

- a. Three. *
- b. Two.
- c. Four.

695. (Refer to figure 1.79) When electrical power is applied to the bus, which relays are energized ?

- a. PCC and TCC. *
- b. TCC and TCO.
- c. PCO and PCC.

696. (Refer to figure 1.79) Energize the circuit with the fuel tank selector switch selected to the left-hand position. Using the schematic, identify the switches that will change position.

- a. 5,9,10,11,12,13,15.
- b. 3,5,6,7,11,13.
- c. 5,6,11,12,13,15,16. *

697. (Refer to figure 1.80) When the landing gears are up and the throttles are retarded, the warning horn will not sound if an open occurs in wire

- a. No. 4. *
- b. No. 2.
- c. No. 9.

698. (Refer to figure 1.80) The control valve switch must be placed in the neutral position when the landing gears are down to

- a. permit the test circuit to operate.
- b. prevent the warning horn from sounding when the throttles are closed. *
- c. remove the ground from the green light.

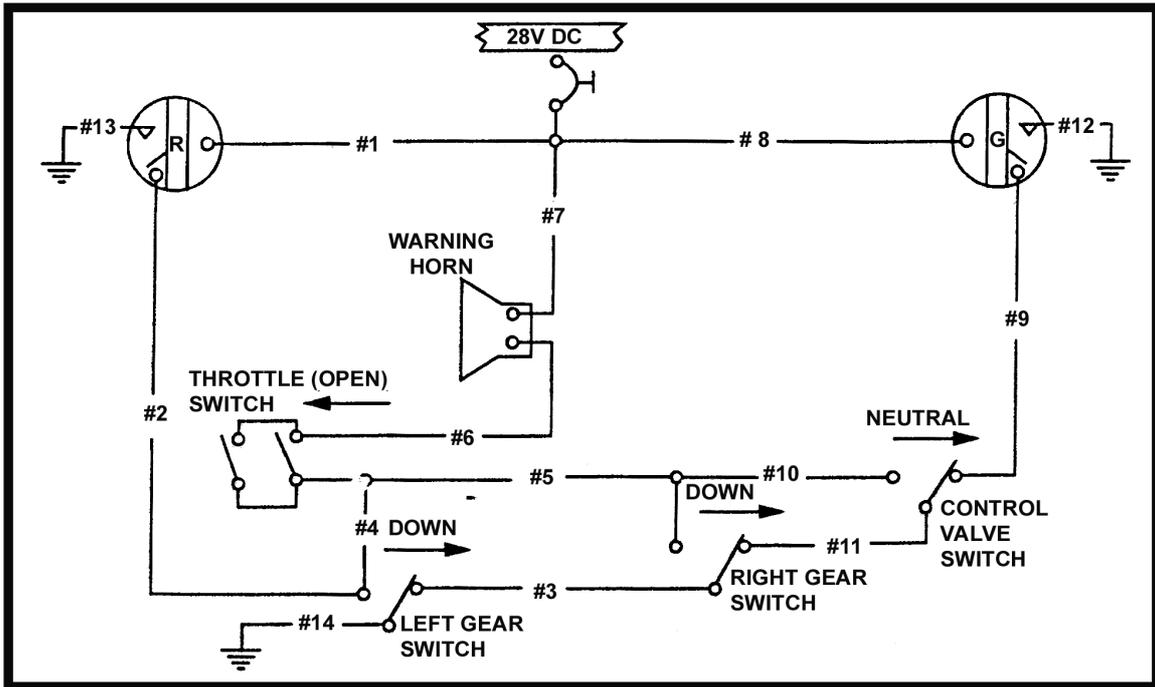


Fig. 1.80. Landing Gear

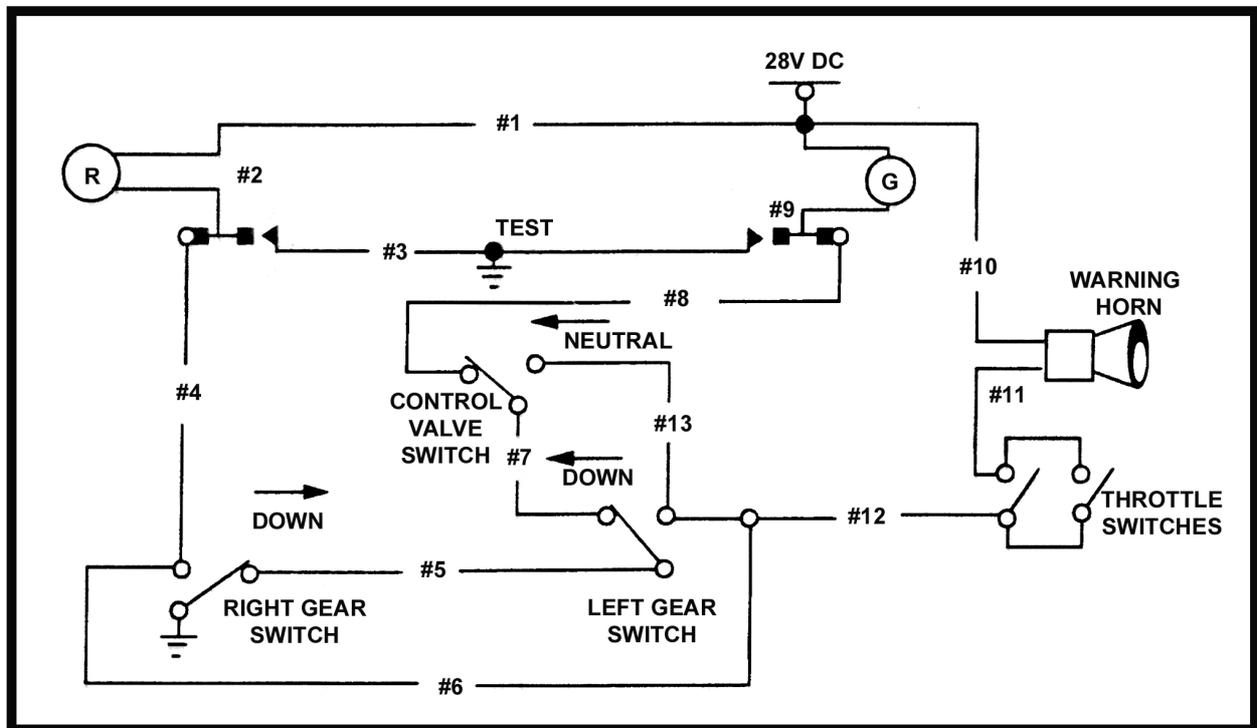


Fig. 1.81. Landing Gear Circuit.

699. (Refer to figure 1.81) Under which condition will a ground be provided for the warning horn through both gear switches when the throttles are closed?
 a. Right gear up and left gear down.
 b. Both gears up and the control valve out of neutral.
 c. Left gear up and right gear down. *
700. (Refer to figure 1.81) When the throttles are retarded with only the right gear down, the warning horn will not sound if an open occurs in wire
 a. No. 5. * b. No. 13.
 c. No. 6.
701. (Refer to figure 1.81) When the landing gears are up and the throttles are retarded, the warning horn will not sound if an open occurs in wire
 a. No. 6. * b. No. 5.
 c. No. 7.
702. When referring to an electrical circuit diagram, what point is considered to be at zero voltage ?
 a. The circuit breaker.
 b. The fuse.
 c. The ground reference. *
703. (Refer to figure 1.82) Troubleshooting an open circuit with a voltmeter as shown in this circuit will
 a. permit current to flow and illuminate the lamp.
 b. create a low resistance path and the current flow will be greater than normal.
 c. permit the battery voltage to appear on the voltmeter. *

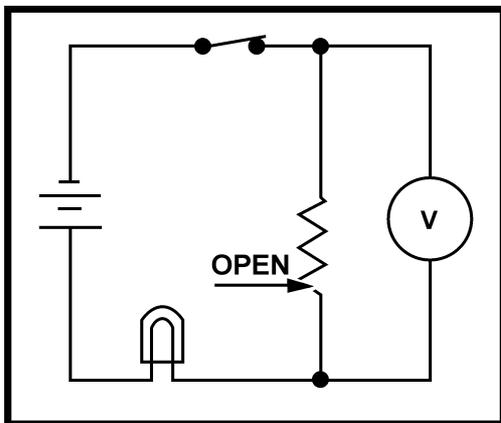


Fig. 1.82. Circuit Diagram.

704. The working voltage of a capacitor to which a.c. of pulsating d.c. is applied should be
 a. the same as or greater than the applied voltage
 b. at least 50 percent greater than the applied voltage*
 c. 1.41 times the applied voltage
 d. 0.707 times applied voltage.
705. A circuit contains 10 ohms of resistance, 20 ohms of inductive reactance, and 30 ohms of capacitive reactance. The circuit is
 a. inductive b. in resonance
 c. resistive d. capacitive. *
706. The opposition offered by a coil to the flow of alternating current is known as
 a. conductivity b. impedance
 c. reluctance d. inductive reactance. *
707. An increase in the inductive reactance of a circuit will be due to increase in
 a. inductance and frequency *
 b. capacitance and voltage
 c. Resistance and voltage
 d. Resistance and capacitive reactance.
708. The resistive force in a d.c. electrical circuit is measured in ohms and referred to as
 a. resistance * b. capacitance
 c. reactance d. inductance.
709. When the capacitive reactance in an a.c. electrical circuit is equal to the inductive reactance, the circuit is
 a. in correct voltage phase angle
 b. in correct current phase angle
 c. out of phase
 d. resonant. *
710. In an alternating current circuit, the effective voltage
 a. is equal to the maximum instantaneous voltage
 b. is greater than the maximum instantaneous voltage
 c. may be greater than or less than the maximum instantaneous voltage
 d. is less than the maximum instantaneous voltage. *
711. The amount of electricity a capacitor can store is directly proportional to
 a. the distance between the plates and inversely proportional to the plate area.
 b. the plate area and is not affected by the distance between the plates
 c. the plate area and inversely proportional to the distance between the plates. *
 d. the distance between the plates and is not affected by the plate area.
712. A transformer with a step-up ratio of 5 to 1 has a primary voltage of 24 V and a secondary amperage of 0.20 A. The primary amperage will be
 a. 1 A * b. 4.8 A
 c. 0.40 A
 d. cannot be determined from the information given.
713. The phase relationship between the current and voltage in an inductive circuit is
 a. The current lags the voltage by 0° *
 b. The current lags the voltage by 90°
 c. The current leads the voltage by 90°
 d. The current leads the voltage by 0°.
714. Current flow is measured in
 a. amperes * b. volts
 c. watts. d. electron flow.

715. Unless otherwise specified, any values given for current or voltage in an alternating current circuit are assumed to be
- average values
 - instantaneous values
 - effective values *
 - maximum values.
716. The devices which will require the most electrical power during operation ? (Note; $1 \text{ hp.} = 746 \text{ W}$)
- A 12 V motor requiring 8 A
 - Four 30-W lamps in a 12 V parallel circuit
 - Two lights requiring 3 A each in a 24 - V Parallel system. *
 - A 1/10 - horsepower, 24 V motor which is 75 percent efficient.
717. The number of amperes that will be required by a 24 -V, 1/3 - horsepower electric motor, when operating at its rated load is (Note: $\text{hp.} = 746 \text{ W}$)
- 10.4 *
 - 13.8
 - 7.9
 - 25.6.
718. A unit in a 28 V aircraft electrical system has a resistance of 10 ohms. The power it will use is
- 280 W
 - 7.84 W
 - 78.4 W *
 - 28 W.
719. A 12 V electric motor has 1,000 W input and 1 hp. output. Maintaining the same efficiency, the input power that will a 24 V, 1-hp. electric motor require is (Note: $1 \text{ hp.} = 746 \text{ W}$)
- 1,000 W *
 - 2,000 W
 - 500 W
 - Cannot be determined from the information given.
720. A 28 V generator required to supply to a circuit containing five lamps in parallel, three of which have a resistance of 6 ohms each and two of which have a resistance of 5 ohms. The number of amperes required is :
- 1.11 A
 - 1 A
 - 0.9 A
 - 25.23 A. *
721. The rate of work done which equal to 1 hp is
- 33,000 ft. ib. per minute *
 - 746 ft. ib. per second
 - 3,300 ft. ib. per minute
 - 55 ft. ib. per second.
722. The wattage rating of a carbon resistor is determined by
- a gold band
 - a silver band
 - the size of the resistor. *
 - a red band.
723. The potential difference between two conductors which are insulated form each other is measured in
- ohms
 - volts *
 - amperes.
 - coulombs.
724. The ratio of the true power to the apparent power in an a.c. electrical circuit is called the power factor. If the true power and the power factor of a circuit are known, the apparent power can be determined by
- multiplying the true power times 100 times the power factor
 - multiplying the power factor times 100 times the power
 - dividing the true power times 100 by the power factor *
 - dividing the power factor times 100 by the true power.
725. A 24-V source is required to furnish 48 W to a parallel circuit consisting of four resistors of equal value. The voltage drop across each resistor is
- 12V
 - 6V
 - 3V
 - 24 V. *
726. When calculating power in a reactive or inductive a.c. circuit in the true power is
- more than the apparent power.
 - more than the apparent power in a reactive circuit and less than the apparent power in an inductive circuit
 - less than the apparent power in a reactive circuit and more than the apparent power an inductive circuit.
 - less than the apparent power. *
727. The power furnished in watts by the generator of the circuit in figure will be (Ref. Fig. 1.83)
- 288 W
 - 24 W
 - 48 W *
 - 12 W.

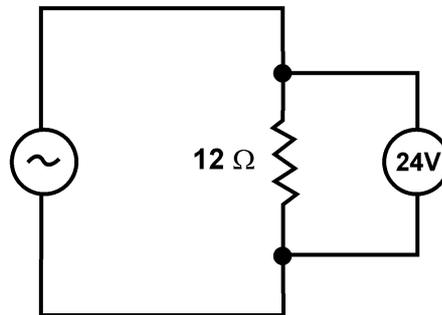


Fig. 1.83

728. In figure 1.84 if resistor R_5 is disconnected at the junction of R_3 as shown. The ohm meter reading will be

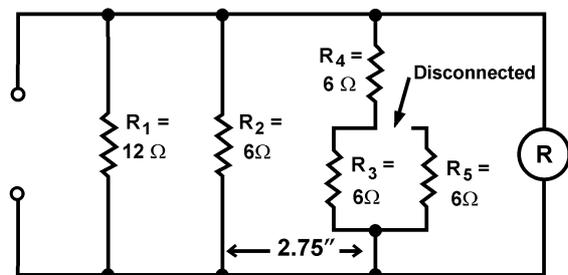


Fig. 1.84

- 9 ohms
- 2.76 ohms
- 3 ohms *
- 12 ohms.

729. Which of the following electrical measuring instruments is most likely to obtain its own source of

electrical power ?

- a. Wattmeter
- b. Ammeter
- c. Voltmeter
- d. Ohmmeter. *

730. The D' Arsonval-type meter movement used in an ammeter, voltmeter, or ohmmeter measures
- a. current flow through the movement *
 - b. potential difference across the movement
 - c. amount of resistance in series with the movement.
 - d. electrical power consumed by the movement.

731. In figure 1.85, resistor R_3 is disconnected at terminal D, the ohmmeter reading will be

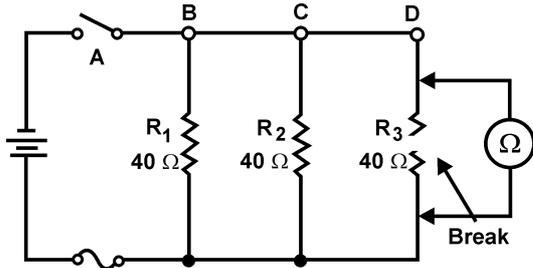


Fig. 1.85

- a. infinite resistance *
- b. 0 ohm
- c. 10 ohms
- d. 20 ohms.

732. In figure 1.86, with an ohmmeter connected into the circuit as shown, the ohmmeter reading will be
- a. 20 ohms
 - b. infinite resistance
 - c. 0 ohm
 - d. 10 ohms *

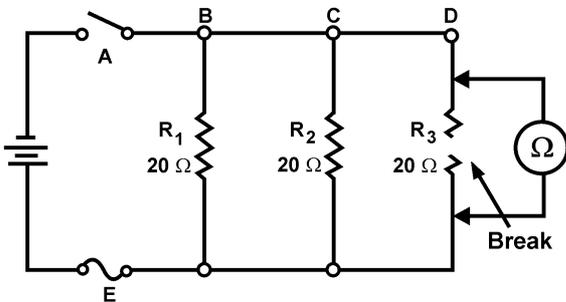


Fig. 1.86

733. In figure 1.87 the number of instruments (voltmeters and ammeters) which are installed correctly is

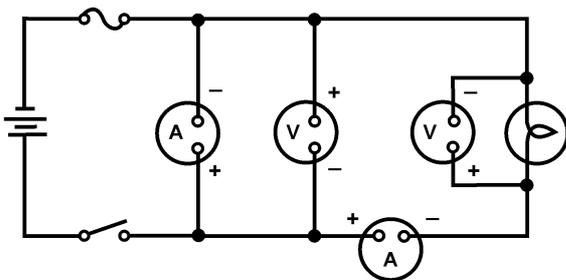


Fig. 1.87

- a. Three
- b. One
- c. Two *
- d. Four.

734. The secondary voltage of a transformer depends upon the efficiency of the transformer and the ratio of the number of turns in the primary winding to the
- a. number of turns in the secondary winding *
 - b. amount of current flowing in the primary winding
 - c. material from which the core is constructed.
 - d. distance separating the windings.

735. The correct way to connect a test voltmeter in a circuit is
- a. in series with a unit
 - b. between source voltage and the load
 - c. in parallel with a unit *
 - d. to place one lead on either side of the fuse.

736. A cabin-entry light of 10 W and a dome light of 20 W are connected in parallel to a 30 V source. If the voltage across the 10 - W light is measured, it will be
- a. one-third of the input voltage.
 - b. twice the voltage across the 20-W light
 - c. equal to the voltage across the 20-W light *
 - d. half the voltage across the 20-Watt light.

737. The device used to measure the very high insulation resistance of electric cables is
- a. High-resistance voltmeter
 - b. Moving iron-vane meter
 - c. Megger *
 - d. Multimeter.

738. Before trouble-shooting, an electrical circuit with a continuity light, must be
- a. connected to the aircraft battery
 - b. connected to the aircraft generator
 - c. isolated *
 - d. connected to an external source of power.

739. A 14-ohm resistor is to be installed in a series circuit carrying 0.05 A. The power to be dissipated by the resistor will be
- a. at least 0.70 milliwatt.
 - b. at least 35 milliwatts *
 - c. less than 0.035 watt
 - d. less than 0.70 milliwatt.

740. The maximum number of electrical wire terminals that can be installed on one stud is
- a. Four terminals per stud *
 - b. Three terminals per stud
 - c. Two terminals per stud
 - d. As many terminals as you can stack on and still have the required number of threads showing through the nut.

741. In figure 1.88, the measured voltage of the series circuit between terminals A and B will be
- a. 1.5V
 - b. 3.0V
 - c. 4.5V
 - d. 6.0V. *

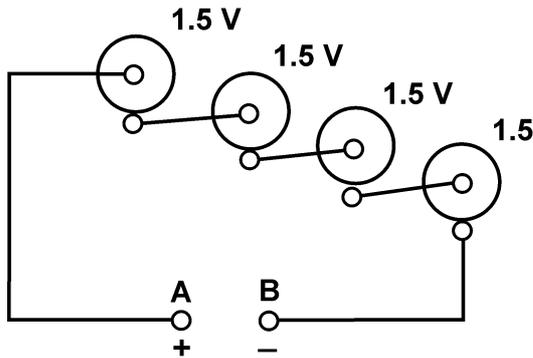


Fig. 1.88

742. The efficiency of power in an a.c. circuit is expressed by
- volt-amperes
 - true power
 - power factor *
 - apparent power.
743. The current in a 60 - W, 120 V electric light bulb is
- 0.5 A *
 - 2 A
 - 1/3 A
 - 1/4 A.
744. The device/system which will require the most electrical power is
- Four 30-W lamps arranged in 12 - V parallel circuit
 - A 12-V landing gear retraction motor which requires 8 A when operating the landing gear
 - A 1/10-horsepower, 24-V motor which is 75 percent efficient.
 - 24-V anticollision light circuit consisting of two light assemblies which require 3A each during operation*
745. The unit used to express electrical power is
- Colomb
 - Volt
 - Watt *
 - Ampere.
746. What is the operating resistance of a 30-W light bulb designed for a 28 -V system ?
- 30 ohms
 - 1.07 ohms
 - 26 ohms *
 - 0.93 ohm.
747. Which of the following statements is correct when made in reference to a parallel circuit ?
- The current is equal in all portions of the circuit.
 - The current in amperes in the product of the EMF in volts times the total resistance of the circuit in ohms.
 - The total current is equal to the sum of the currents through the individual branches of the circuit. *
 - The current in amperes can be found by dividing the EMF in volts by the sum of the resistors in ohms.
748. Diodes are used in electrical power circuits primarily as
- current eliminators
 - circuit cutout switches
 - rectifiers *
 - power transducer relays.

749. Three resistors of 3 ohms, 5 ohms, and 22 ohms are connected in series in a 28-V circuit. The current will flow through the 3-ohm resistor is
- 9.3 A
 - 1.05 A
 - 1.03 A
 - 0.93 A. *
750. A good conductor of electricity is a material
- through or along which electrons move freely *
 - whose protons are all on the outside
 - that contains few electrons
 - through or along which protons move freely.
751. A circuit has an applied voltage of 30 V and load consisting of a 10-ohm resistor in series with a 20-ohm resistor. The voltage drop across the 10-ohm resistor will be
- 15V
 - 10 V *
 - 20V
 - 30V.
752. In figure 1.89, the total current flowing in the wire between points C and D in will be

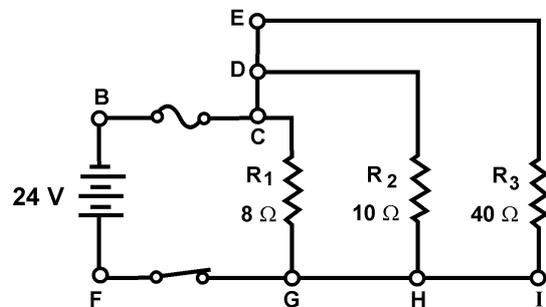


Fig. 1.89

- 6.0 A
 - 2.4 A
 - 3.0 A *
 - 0.6 A.
753. In above figure 1.89, the voltage across the 8-ohm resistor will be
- 2.4V
 - 12V
 - 20.4V
 - 25 V. *
754. In the following figure (Fig. 1.90), the total resistance of the circuit across battery will be

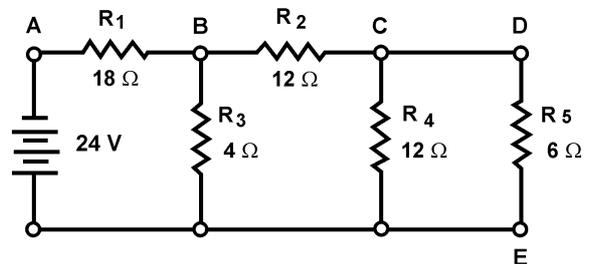


Fig. 1.90

- 16 ohms
 - 10.4 ohms.
 - 2.6 ohm
 - 21.1 ohms. *
755. Which of the following is correct in reference to electrical resistance ?
- Two electrical devices will have the same combined resistance if they are connected in series as they will have if connected in parallel.

- b. If one of three bulbs in a parallel lighting circuit is removed, the total resistance of the circuit will become greater. *
- c. An electrical device that has a high resistance will use more power than one with a low resistance with the same applied voltage.
- d. A 5-ohm resistor in a 12-volt circuit will use less current than a 10-ohm resistor in a 24-volt circuit.

756. An electric cabin heater draws 25 A at 110 V. The current will that flow if the voltage is reduced to 85 will be
- a. 19.3 A *
 - b. 44.0 A
 - c. 4.4 A
 - d. 1.93 A.

757. In figure 1.91, the total current I_T flow in the circuit

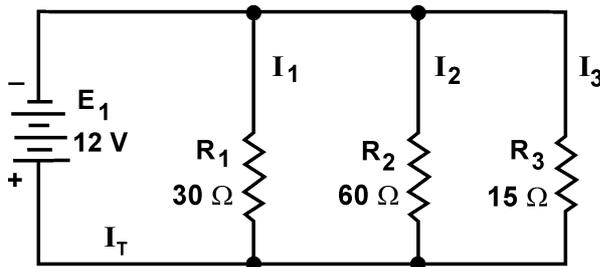


Fig. 1.91

- a. 0.2 A
- b. 1.4 A *
- c. 0.4 A
- d. 0.8 A.

758. In figure 1.92, the total resistance of the circuit is

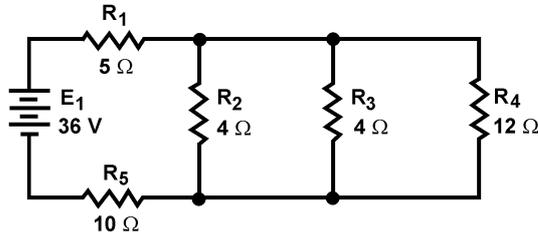


Fig. 1.92

- a. 25 ohms.
- b. 35 ohms
- c. 37 ohms
- d. 17 ohms. *

759. Through which of the following will magnetic lines of force pass the most readily ?
- a. Copper
 - b. Iron *
 - c. Aluminium
 - d. Titanium.

760. A 48 V source is required to furnish 192 W to a parallel circuit consisting of three resistors of equal value. The value of each resistor will be
- a. 36 ohms *
 - b. 4 ohms
 - c. 8 ohms
 - d. 12 ohms.

761. Which is correct statement concerning a parallel circuit?
- a. Total resistance will be smaller than the smallest resistor *
 - b. Total resistance will decrease when one of the resistances is removed
 - c. Total voltage drop is the same as the total resistance
 - d. Total amperage remains the same, regardless of the resistance. *

762. The voltage drop in a conductor of known resistance is dependent on
- a. the voltage of the circuit.
 - b. the amount and thickness of wire insulation
 - c. only the resistance of the conductor and does not change with a change in either voltage or amperage
 - d. the amperage of the circuit.
763. An electric motor malfunctions causing it to over heat, which will cause an incorporated thermal switch to
- a. prevent an open circuit
 - b. break the circuit *
 - c. close the circuit
 - d. break the circuit when cooled.

TRUE/FALSE

1. The direction of flow of conventional current is taken opposite to that of electrons. (T)
2. Electrons have negative charge. (T)
3. The hot resistance of the bulb's filament is higher than its cold resistance. (T)
4. The resistivity of bulb's filament is high. (T)
5. Two wires of same length with different x-sectional areas are connected in series. The heat produced by the currents is more in the thicker wire. (F)
6. The thicker wire has low resistance. (T)
7. Leclanche cell is an example of secondary cell. (F)
8. Leclanche cell has high internal resistance. (T)
9. During charging of a lead acid cell the electrolyte becomes stronger. (T)
10. During discharging of a lead acid cell sulphuric acid is formed. (F)
11. Lead acid battery container is made up of glass, lead lined wood, ebonite, hard rubber or bituminous compound ceramic materials or moulded plastics. (T)
12. Containers of lead acid batteries should be acid resistant. (T)
13. For preparing electrolyte for lead acid battery, acid is poured into water (T)
14. Pouring of water into the acid battery will preparing electrolyte for lead acid battery will result in explosion. (T)
15. In a lead acid battery, the level of electrolyte must be maintained at least 10 or 15 mm above the plates. (T)
16. If the plates of a lead-acid battery are exposed to air, its capacity and life will reduce and exposed portion of plates will be converted into lead sulphate. (T)

17. Nickel-cadmium accumulators are superior to nickel-iron accumulators. (T)
18. Nickel cadmium accumulators have higher voltage per cell, less weight and low cost in comparison to those of nickel-iron accumulators. (T)
19. Nickel-iron accumulators are particularly suitable for severe services such as propulsion of industrial trucks and mine locomotives. (T)
20. Nickel iron accumulators have low running cost and need very less maintenance. (T)
21. A capacitor can store charge. (T)
22. The plates of the condenser are conductive. (T)
23. Storing of electrical energy in dielectric materials is analogous to stretching of a spring. (T)
24. Iron, cobalt and nickel are ferromagnetic. (T)
25. Alnico (aluminium-nickel-iron-cobalt) alloys are the most important of hard magnetic materials. (T)
26. Soft magnetic materials cannot be used for the construction of cores for the electrical machines. (T)
27. Soft magnetic materials have relatively small and narrow hysteresis loop. (T)
28. Hard magnetic materials are used for making permanent magnets. (T)
29. Hard magnetic materials after magnetization store a considerable amount of magnetic energy, and retain it for a long time. (T)
30. A. Magnetic leakage is considered undesirable in electric machines. (T)
31. It is usually difficult to magnetise steel. (T)
32. Wrought iron and steel are most suitable for permanent magnets. (T)
33. Hard steel is most suitable for transformer core and armatures. (F)
34. Hard steel has high retentivity power and large coercive force. (T)
35. Silicon alloys and permalloy are most suitable for core of electro-magnets. (F)
36. The B-H product is a measure of the energy required for demagnetization. (T)
37. A laminated iron core has reduced iron losses. (T)
38. The lamination are insulated from each other and result in high resistance to eddy current. (T)
39. A ferrite core has less eddy current loss than iron core. (T)
40. Ferrites have high resistance. (T)
41. When we touch electric appliances with wet hands, the transition resistance to the body reduces considerably. (T)
42. Switching operation produces arc across separating contacts. (T)
43. One ampere means the flow of one coulomb each second. (T)
44. Voltage applied across a circuit, acts as a force. (T)
45. The lower the resistivity, greater the resistance. (F)
46. Specific resistance is measured in Ω/m^3 . (T)
47. The reciprocal of resistivity of a material is called its conductivity. (T)
48. At very low temperature, some metals acquire zero electrical resistance and zero magnetic induction; this property is called the superconductivity. (T)
49. The specific resistance of copper increases with the increase in temperature. (T)
50. Power rating of a resistor largely depends on the physical size of the resistor. (T)
51. The heating effect of electric current is always desirable. (F)
52. Two heater coils of same material are connected in parallel across the supply. Coil A has diameter and length double that of coil B. Coil B will produce more heat. (F)
53. Resistance of a tungsten filament lamp decreases with the increase in supply voltage. (F)
54. If two lamps 100 W and 40 W are connected in series across 230 V ac supply, 100 W lamp will glow brighter. (F)
55. The central terminal of a dry cell is always negative. (F)
56. In reciprocity theorem voltage and current remain same in all parts of the networks. (F)
57. In substitution theorem, compensating voltage is a dependent source. (T)
58. There is no relation between Thevenin's theorem and Norton's theorem. (F)
59. Superposition theorem is applicable to linear as well as non-linear networks. (F)

60. Superposition theorem is not applicable to a network containing time varying resistors. (T) electrolyte is exposed to air. (T)
61. Thevenin's theorem is quite useful when the current in one branch of a network is to be determined or when the current in an added branch is to be determined. (T) 80. Edison cells cannot be kept in discharged condition for a long period. (F)
62. Maximum power transfer theorem is particularly useful for analysing communication networks. (T) 81. Short-circuits in alkaline cells do not reduce the life. (T)
63. Any practical voltage source can be converted into a practical current source and vice-versa. (T) 82. Dielectric constant and permittivity are same. (T)
64. The internal resistance of a cell is assumed to remain constant irrespective of the load current delivered by the cell. (T) 83. Potential of every point inside a hollow charged sphere is same. (T)
65. For all substances the ratio of electrochemical equivalent to chemical equivalent is the same and is equal to 0.01036. (T) 84. In electrostatic field $\Delta \times E = 0$. (T)
66. During charging of a lead acid cell the specific gravity of a cell decreases. (F) 85. The charge in a capacitor is stored in dielectric field. (T)
67. Faure or pasted plates are lighter in weight and cheaper in cost than formed or plate plates. (T) 86. A capacitor is sort of open circuit to dc. (T)
68. The grids of positive plates are lighter than those of negative plates. (F) 87. The current through a capacitor is zero if the voltage across it is not changing with time. (T)
69. There is always one more positive plate than the negative plates in lead-acid batteries. (F) 88. The capacitor never dissipates energy but only stores it. (T)
70. In a lead acid battery the positive terminal is of comparatively larger diameter than that of negative terminal. (T) 89. A magnetic pole is a terminal where a magnetic material meets a non-magnetic material. (T)
71. To prevent local action in a battery, only distilled water is used in electrolytes. (T) 90. The net magnetic flux emerging through a closed surface is zero. (T)
72. Charging of sulphated battery produces very little heat. (F) 91. A torodial magnet has no air gap. (T)
73. A sulphated battery should be charged always for a longer period at low rate. (T) 92. The torodial type of construction is employed where there must be a minimum of external magnetic field. (F)
74. Undercharging of a lead acid battery causes increase in specific gravity of the electrolyte. (F) 93. With the insertion of an iron core to a coil, magnetic field is strengthened. (F)
75. In constant current charging method voltage is reduced as the battery gets charged. (F) 94. With the insertion of an iron core into a coil the reluctance of the iron path increases. (F)
76. In constant voltage charging, current increases as the battery gets charged. (F) 95. Ferromagnetism arises out of the electron structure. (T)
77. The emf of a storage battery depends upon the size of the electrodes. (F) 96. When a ferromagnetic material is magnetized its magnetic poles get oriented in the direction of coercive force. (F)
78. The plates of alkaline cells do not buckle or swell. (T) 97. During the process of magnetization when all the magnetic dipoles of a magnetic material get oriented in one direction, the core is said to be grain oriented. (F)
79. The capacity of Edison cell decreases when its (T) 98. Static magnetic fields induce currents in closed conducting loops. (F)
100. Eddy current losses are reduced by using thin plates of low resistivity material. (T)
101. Loop-in-system is universally used for connections of various lamps and other appliances in parallel. (T)

102. Conduit wiring provides protection against fire and mechanical damage. (T)
103. Fuse is provided only in phase wire, never on neutral wire. (T)
104. In motor wiring installations looping of conductors and use of tee-joints is not permitted. (T)
105. The total weight of a nucleus (i.e. protons plus neutrons) is called atomic number (z). (F)
106. The centripetal force necessary to keep electrons rotating in elliptical orbits round the nucleus is supplied by the force of attraction between their charges. (T)
107. Those substances whose atoms have their outermost orbits incomplete act as bad conductor of electricity. (F)
108. Substances whose electrons are rigidly held to their atoms are termed as bad conductors. (T)
109. The resistance of a conductor is varies directly as the cross - section of the conductor. (F)
110. The resistance between the opposite faces of a meter cube of that material is known as resistivity. (T)
111. The resistance of insulator is increasing with the rise in temperature. (F)
112. The resistivity of commercial materials may differ by several percent due to impurities etc. (T)
113. According to Ohm's law when the resistance is kept constant, the current is inversely proportional to the potential difference across the ends of a conductor. (F)
114. By electrical power we mean the product of voltage and current. (T)
115. In an electrical circuit resistance $R = (W/V)$. (F)
116. In an electrical circuit current $I = (W/V)$. (T)
117. In an electrical circuit voltage $V = \sqrt{(W/R)}$. (F)
118. When two resistance are connected in series same current will pass through them. (T)
119. When resistance are connected in series the potential difference across all resistance are same. (F)
120. When three resistance are connected in series then the sum of the three voltage drop is equal to the voltage applied across the three conductors. (T)
121. When resistance are connected in parallel then the current passes through each resistor is same (F)
122. In parallel combination of resistors, the equivalent resistance is less than the least among the resistors. (T)
123. When resistance are connected in parallel then the potential difference across all resistance is different. (F)
124. Resistivity of a given material is not the same at all temperatures. (T)

FILL IN THE BLANKS

- The rate of movement of charge in a conductor is known as _____.(**electric current**)
- _____ is the force that causes a current to flow(**EMF**)
- Voltage across a resistance is called the _____.(**voltage drop**)
- For the same dimensions of conductor its resistance depends upon the _____ of the materials (**resistivity**)
- The resistivity of elements of electric heaters are normally _____ (**high**)
- The property of a conductor due to which it induces the flow of current through the conductor is called the _____(**Conductance**)
- An iron takes 5 A to 250 V. Its power rating is _____ kw. (**1.25**)
- Resistance of carbon filament lamp _____ with the increase in supply voltage.(**decreases**)
- The operating cost of ten 100 W lamps at their rated voltage for 20 hours at the rate of Rs. 2.50 per unit is _____. (**50.00**)
- For the two port network shown in the figure 1.57 the admittance matrix is _____.

$$\begin{pmatrix} 0.2 & -0.1 \\ -0.1 & 0.2 \end{pmatrix}$$

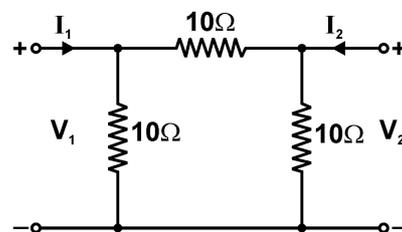


Fig. 1.93

- For the circuit shown in the figure 1.58 the Norton equivalent source current value is _____ A and its resistance is _____ ohms. (**2, 4.5**)

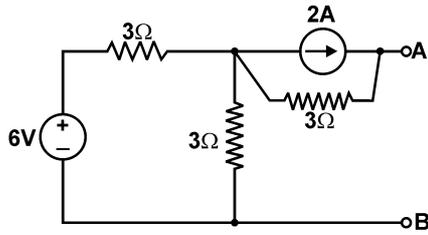


Fig. 1.94

12. A 10 V battery with an internal resistance of 1Ω is connected across a non-linear load whose V-I characteristics is given by $7I = V^2 + 2V$. The current delivered by the battery is _____ A. **(5)**
13. The value of E and I for the circuit shown in the figure 1.59 are _____ V and _____ A. **(31, 13)**

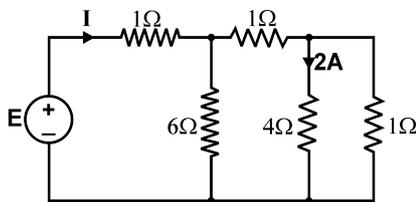


Fig. 1.95

14. The electrode for a battery must be a _____ conductor. **(good)**
15. A battery of 6 V and internal resistance 0.02 Ω will carry a current of _____ when short-circuited. **(300A)**
16. A 12 V battery has internal resistance of 0.5 Ω. Maximum power will be dissipated in the resistor when load connected to it is of _____ ohm. **(0.5)**
17. If a current of 25 A deposits 33.55 g of silver nitrate in 20 minutes from a solution of silver nitrate, then the ECE of silver is _____ gm/coulomb. **(0.001118)**
18. In a lead acid cell hydrogen is liberated at _____ plate. **(negative)**
19. During charging of a battery the terminal voltage decreases with the _____ in temperature. **(increase)**
20. In a lead acid battery porous rigid plastic sheets are inserted between plates to prevent _____ between plates. **(Short Circuiting)**
21. The _____ of plates reduces the internal resistance and increases the capacity of the cell. **(interlacing)**
22. Battery charging rate of battery in amperes is around _____ of its ampere hour capacity. **(one-eighth)**

23. Battery charging room is to be kept well ventilated so as to reduce the hydrogen concentration below _____ percent. **(three)**
24. The best indication about the state of charging of a lead-acid battery is given by _____ of electrolyte. **(specific gravity)**
25. To avoid freezing in cold weather, specific gravity of the electrolyte of the lead-acid cell should be kept above _____. **(1.225)**
26. The expected life of a lead-acid battery is _____ years. **(2 to 5)**
27. Lead acid battery should not remain discharged normally for more than _____ hours. **(24)**
28. The internal resistance of an Edison cell is about _____ times that of lead acid cell. **(five)**
29. For a given ampere-hour capacity, weight of lead acid cell is _____ of that Edison cell. **(twice)**
30. A hollow conductor is at a potential V. The potential at any point inside the hollow conductor is _____. **(V)**
31. The _____ is the rate of change of potential measured in the direction of electric force. **(potential gradient)**
32. The concept of displacement current was introduced by _____. **(Maxwell)**
33. _____ is a measure of the ability of a capacitor to store an electric charge. **(capacitance)**
34. There are two concentric conducting spherical surfaces of radii a, b ($a < b$). The inner spherical surface carries a charge Q and the outer surface is grounded. What is the potential of the inner spherical surface ?

$$\left[\frac{Q}{4\pi \epsilon_0 \epsilon_r} \left(\frac{1}{a} - \frac{1}{b} \right) \text{volts} \right]$$
36. The capacitance of an isolated sphere of radius 10cm in air is equal to _____ pF. **(11.11)**
37. The capacitance of the arrangement shown in the figure 1.60 is _____ pF. **(4.72)**

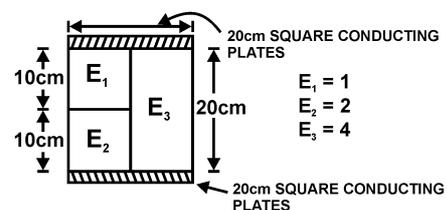


Fig. 1.96

38. When a capacitor is charged from a constant current source for a time t , the voltage across it will grow _____ . (**linearly**)
39. Absolute permeability of vacuum is _____ H/m. ($4\pi \times 10^{-7}$)
40. In right hand rule when thumb points in the direction of flow of current then finger tips will point the direction of _____ of force. (**magnetic lines**)
41. The shape between the poles of a magnet is called the _____. (**airgap**)
42. The transfer of magnetism from one magnetic material to another is called the magnetic _____. (**induction**)
43. _____ force drives or tends to drive flux through a magnetic circuit. (**magneto motive**)
44. The product of the number of turns and flux linking with the coil is known as _____. (**flux linkage**)
45. The inductance of a coil is proportional to the _____ number of turns, all other parameters remain the same. (**Square**)
46. Two identical coils of negligible resistance when connected in series across a 200 V, 50 Hz source draw a current of 10 A. When the terminals of one of the coil are reversed, the current drawn is 8 A. The coefficient of coupling between the two coils is _____. (**1/9**)
47. The voltage and current waveforms for an element are shown in the figures 1.61. The circuit element is _____ and its value is _____. (**inductor, 2H**)

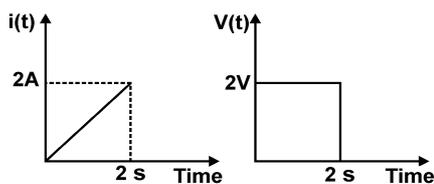


Fig. 1.97

48. The power of retaining some magnetism after removing the magnetising force is called the _____. (**retentivity**)
49. The magnetising force required to neutralise the magnetism is called the _____ force. (**coercive**)
50. The lagging of magnetic flux density B behind the magnetic field intensity is known as magnetic. (**hysteresis**)
51. The _____ currents produce a magnetic field of their own which opposes the main magnetic field. (**eddy**)
52. The combination of two dissimilar metals is known as _____. (**thermocouple**)
53. The rate of change of thermo-emf with temperature is known as _____. (**thermo electric power**)
54. According to I.E. Rule no. 48 the insulation resistance between the wiring of an installation and earth should be of such a value that the leakage current may not exceed _____ per cent of the full-load current. (**0.02**)
55. The number of protons in the nucleus of an atom gives the _____ of the substance whose atom it is. (**atomic number**)
56. The total weight of a nucleus (i.e. protons plus neutrons) is called _____. (**atomic mass number**)
57. One coulomb is equal to the charge of _____ electrons. (6.242×10^{18})
58. The maximum number of electron in any orbit of an atom will not exceed _____. (**32**)
59. Substances whose atoms have their outermost orbits incomplete act as _____ conductors of electricity. (**good, bad**)
60. Substances whose electrons are rigidly held to their atoms act as _____ conductors of electricity. (**bad, good**)
61. The resistance of a conductor varies directly as its _____. (**length, cross-section**)
62. The resistance of a conductor varies inversely as the _____ of the conductor. (**cross-section, length**)
63. The resistance between the opposite faces of a metre cube of that material is known as _____. (**specific resistance, conductivity**)
64. Conductance is reciprocal of _____. (**resistance, potential difference**)
65. When temperature increases, the resistance of pure metal will _____. (**increase, decrease**)
66. When temperature increases, the resistance of insulator will _____. (**decrease, increase**)
67. According to ohm's law the current in an electrical circuit is equal to _____. (**potential difference / resistance, resistance / potential difference**)
68. According to ohm's law the potential difference of an electrical circuit is equal to _____. (**current \times resistance, current / resistance**)
69. According to ohm's law the resistance of an electrical circuit is equal to _____. (**potential difference / current, current / potential difference**)

70. When resistance are connected in series, then the current passes through each of them is _____. (same, **different**)
71. When resistance are connected in series, then the voltage drop across each is _____. (**different**, same)
72. When resistance are connected in series, the total resistance will be _____. (**sum of the all resistance**, less than the least resistance)
73. When resistance are connected in parallel, then the voltage drop across each is _____. (**same**, more, less)
74. When resistance are connected in parallel, then the total resistance will be _____ than the least among the resistance. (**less**, more, same)
75. Kirchoff's law, which states, 'in any network of conductors, the algebraic sum of the currents meeting at a point is zero', is known as _____. (**current law**, voltage law, mesh law)
76. Kirchoff's law, which states, 'the algebraic sum of the product of current and resistance in each of the conductors in any closed mesh in a network plus, the algebraic sum of the e.m.f.s in that path is zero', is known as _____. (current law, point law, **voltage law**)
77. According to Kirchoff's second law, 'all the sources of emf met on the way must necessarily be _____ the voltage drops in the resistances'. (half, double, **equal**)
78. According to Kirchoff's law, 'in any network of conductors, the algebraic sum of the currents meeting at a point is _____'. (one, **zero**, infinitive)
79. While applying Kirchoff's laws to specific problems, a rise in voltage should be given _____ sign. (+ve, -ve, no)
80. While applying Kirchoff's laws to specific problems, a -ve sign is given for _____ voltage. (rise in, **fall in**, same)
81. In applying Kirchoff's laws to specific problems, as we go from the +ve terminal of a battery to its -ve terminal, there is a _____ potential. (rise in, **fall in**, same)
82. In applying Kirchoff's laws to specific problems, if we go through a resistor in the opposite direction as the current, then there is a _____ potential. (**rise in**, fall in, same)
83. In applying Kirchoff's laws to specific problems the sign of battery e.m.f. is _____ the direction of current through that branch. (**independent of**, dependent on)
84. In applying Kirchoff's laws to specific problems, the sign of voltage drop across a resistor _____ the direction of current through that register. (independent of, **dependent on**)
85. The magnetic flux passing per unit cross-section at that point is known as _____. (field intensity, magnetic potential, **flux density**)
86. Field intensity or field strength is a _____ quantity. (**vector**, scalar)
87. Magnetic potential is a _____ quantity. (vector, **scalar**)
88. The temperature in which a magnetic material loses all its magnetism is known as _____. (magnetic temperature, absolute temperature, **curie point**)
89. The value of curie point is about _____ °C. (850, 650, **750**)
90. The relative permeability of ferromagnetic substance is _____. (**very high**, slightly greater than unity, slightly less than unity)
91. Nickel is an example of _____ material. (**ferromagnetic**, paramagnetic, diamagnetic)
92. The relative permeability of paramagnetic substance is _____. (very high, **slightly greater than unity**, slightly lesser than unity)
93. Aluminium is an example of _____ material. (ferromagnetic, **paramagnetic**, diamagnetic)
94. Silver is an example of _____ material. (ferromagnetic, paramagnetic, **diamagnetic**)
95. The relative permeability of diamagnetic substance is _____. (very high, **slightly less than unity**)
96. The unit of magnetomotive force (mmf) is _____. (Ampere-meter, Ampere-hour, **Ampere turns**)
97. Permeability of a magnetic circuit is analogous to _____ of an electrical circuit. (resistivity, current density, **conductivity**)
98. Whenever a magnetic flux linked with a circuit changes, an _____ is always induced in it. (current, **e.m.f.**, flux)
99. According to Lenz's law, the current induced in a coil always _____ the cause producer it. (assist, **oppose**)
100. Dynamically induced e.m.f. can be found in _____. (battery, transformer, **generator**)
101. The direction of induced e.m.f. in a coil may be found with the help of _____. (Flemings left hand rule, Faraday's laws, **Flemings right hand rule**)
102. Whenever an e.m.f. is induced in one coil by the influence of other coil, it is called _____. (**mutually**)

induced e.m.f., self induced e.m.f., dynamically induced e.m.f.)

103. When the e.m.f. induced in a coil due to the change of its own flux linked with it, is called _____. (mutually induced e.m.f., **self induced e.m.f.**, dynamically induced e.m.f.)
104. The property of the coil due to which it oppose any increase or decrease of current is known as _____. (mutual inductance, **self inductance**, impedance)
105. In a coil having large self induction, it is initially _____ to establish a current through it. (easy, **difficult**)
106. Self induction is sometimes analogously called _____. (electrical friction, electrical pressure, **electrical inertia**)
107. The weber-turns per ampere in a coil is known as _____. (coefficient of mutual induction, **coefficient of self induction**, coefficient of dynamic induction)
108. The ability of one coil to produce an e.m.f. in a nearby coil by induction when the current in first coil changes is known as _____. (self induction, dynamic induction, **mutual induction**)

Question/Answer

1. One kilowatt is equal to how many watts ?

Ans. 1,000 watts.

2. What law describes the most fundamental or basic relationships in an electrical circuit ?

Ans. Ohm's law.

3. What are the three elements of Ohm's law ?

Ans. Voltage, current and resistance.

4. How would you write Ohm's law as an equation?

Ans. $E = I \times R$, $R = E / I$, $I = E / R$.

5. If the resistance in a DC circuit remains the same but the voltage doubles, what happens to the amount of current flowing in the circuit ?

Ans. It also doubles.

6. In DC circuits, what unit measures power ?

Ans. Watts.

7. What three elements are required to form an electrical circuit ?

Ans. A source of electrical energy, a load or resistance to use the electricity, and wires or conductors to connect the source to the load.

8. DC circuits can take one of three forms or types. What are they ?

Ans. Series, parallel and complex (or series parallel).

9. A 24-volt lead-acid battery has how many cells ?

Ans. Twelve.

10. A fully charged lead-acid battery has a specific gravity that varies between what two values ?

Ans. 1.275 and 1.300.

11. You must apply a correction to the specific gravity reading of the electrolyte of a lead-acid battery when the temperature is outside of what two values ?

Ans. Whenever the temperature is less than 70° F or more than 90° F.

12. What is the reason for having separate facilities for storing and servicing nickel-cadmium and lead-acid batteries ?

Ans. The electrolyte in the two types of batteries is chemically opposite and the fumes from one type can contaminate the electrolyte of the other type.

13. The state of charge of a nickel-cadmium battery cannot be determined by measuring the specific gravity of the electrolyte for what reason ?

Ans. There is no significant change in the specific gravity of the electrolyte as the battery is charged or discharged.

14. What is the principal advantage of AC current over DC current ?

Ans. Power can be transmitted over long distance more efficiently and with smaller wires because the voltage can be easily increased or decreased by a transformer.

15. What are the three causes of opposition to current flow in an AC circuit ?

Ans. Resistance, inductive reactance and capacitive reactance.

16. Define inductance.

Ans. An induced voltage which is opposite in direction to the applied voltage.

17. What component creates capacitance in AC circuits ?

Ans. A capacitor.

18. How does a capacitor store electricity ?

Ans. The energy is stored in the form of an electrostatic charge or field that exists between two conductors separated by an insulator.

19. What property of an AC circuit is defined by the term "impedance" ?

Ans. The total opposition to current flow.

20. What are two reasons that might cause a nickel-cadmium battery to fail to deliver its rated capacity?

Ans. Faulty cells or cell imbalance.

21. What electrical values are measured by a typical multimeter ?

Ans. Voltage, current and resistance.



CHAPTER : 4

DETAILED KNOWLEDGE OF ALTERNATING CURRENT AND CALCULATION OF INSTANTANEOUS VALUE, RMS VALUE, FREQUENCY AND AMPLITUDE FROM THE GIVEN DATA, STAR AND DELTA CONNECTIONS AND CALCULATION OF POWER IN THREE PHASE SYSTEM

1. Alternating voltage may be generated
 - a. only by rotating a magnetic field within a stationary coil
 - b. only by rotating a coil in a magnetic field
 - c. By keeping both coil and magnetic field stationary
 - d. Both a) and b) are correct *
2. While generating alternating voltage, the value of the voltage generated is depends upon
 - a. the number of turns in the coil
 - b. strength of the field
 - c. speed at which the coil or magnetic field rotates
 - d. all the above *
3. One complete set of positive and negative values of an alternating quantity is known as
 - a. frequency
 - b. amplitude
 - c. cycle *
 - d. Time period
4. The time taken by an alternating quantity to complete one cycle is called its
 - a. frequency
 - b. amplitude
 - c. cycle
 - d. time period *
5. The frequency of the alternating voltage is depends upon
 - a. only on the speed of alternator
 - b. only on the number of poles of the alternator
 - c. Both a) and b) *
 - d. None of the above
6. The maximum value, positive or negative, of an alternating quantity is known as its
 - a. frequency
 - b. amplitude *
 - c. cycle
 - d. time period
7. If a 60 Hz engine driven alternator has a speed of 1200 rpm, the number of poles of that alternator is :
 - a. 4
 - b. 6 *
 - c. 8
 - d. 10
8. For finding r.m.s. value of a symmetrical sinusoidal alternating current, we can use
 - a. only mid - ordinate method
 - b. only analytical method
 - c. both a. and b. are correct *
 - d. none of the above
9. For a symmetrical sinusoidal current, the r.m.s. value of current is equal to
 - a. 0.637 x maximum value of current
 - b. 0.707 x maximum value of current *
 - c. 0.637 x average value of current
 - d. 0.707 x average value of current
10. The value of alternating current recorded by an ammeter is of
 - a. maximum value
 - b. average value
 - c. r.m.s. value *
 - d. all the above
11. The steady current which transfers across any circuit the same charge as is transferred by that alternating current is known as
 - a. maximum value
 - b. average value *
 - c. r.m.s. value
 - d. form factor
12. For a symmetrical sinusoidal current, the average value of current is equal to
 - a. 0.637 x maximum value of current *
 - b. 0.707 x maximum value of current
 - c. 0.637 x average value of current
 - d. 0.707 x average value of current
13. The ratio of r. m. s. value and average value is known as
 - a. amplitude
 - b. form factor *
 - c. time period
 - d. amplitude factor
14. The ratio of maximum value and R. M. S. value is known as
 - a. amplitude
 - b. form factor
 - c. time period
 - d. amplitude factor *
15. Knowledge of amplitude factor is necessary in dielectric insulation testing because the dielectric stress to which the insulation is subjected, it proportional to the
 - a. Average value of applied voltage
 - b. R. M. S. value of applied voltage
 - c. Instantaneous value of applied voltage
 - d. Maximum value of applied voltage *
16. In a purely resistive circuit, power will never become
 - a. more than unity
 - b. zero *
 - c. unity
 - d. more than hundred

17. Whenever an alternating voltage is applied to a pure inductive coil, a back e.m.f. is produced due to the
- Mutual inductance of the coil
 - Self inductance of the coil *
 - Impedance of the coil
 - Resistance of the coil
18. A sinusoidal alternating voltage which undergoes 100 reversals of polarity per second has a frequency of
- 100Hz
 - 200Hz
 - 50 Hz *
 - 25Hz
19. The time period of a sine wave of frequency 50 Hz is
- 50 seconds
 - .05 seconds
 - .5 seconds
 - .02 seconds *
20. The average value of a symmetrical sinusoidal alternating current is
- 1
 - 0 *
 - 10
 - 100
21. Net power consumed by a pure inductive coil or pure capacitor is
- 1 watt
 - 5 watt
 - 0 watt *
 - 10 watt
22. The direction of an alternating current
- keeps changing
 - cannot be found
 - keeps reversing *
 - is fixed
23. The r.m.s. value of a sinusoidal alternating current is equal to its value at an angle of
- 60 degrees
 - 45 degrees *
 - 30 degrees
 - 90 degrees
24. Two sinusoidal currents are given by the equations; $i_1 = 10 \sin [wt + (\pi/3)]$ and $i_2 = 15 \sin [wt - (\pi/4)]$. The phase difference between them is
- 105 *
 - 75
 - 15
 - 60
25. A sine wave has a frequency of 50 Hz. Its angular velocity is
- $(50/\pi)$ radian / second
 - $(50/2\pi)$ radian / second
 - 50 π
 - 100 π *
26. An alternating current is given by $i = 100 \sin 100 \pi t$. It will achieve a value of 50 A after :
- 1/600 Seconds *
 - 1/300 Seconds
 - 1/1800 Seconds
 - 1/900 Seconds
27. A coil has $X_L = 1000 \Omega$. If both its inductance and frequency are doubled its reactance will become
- 2000 Ohm
 - 500 Ohm
 - 200 Ohm
 - 4000 Ohm *
28. If a moving coil ammeter is used to measure the value of an alternating sinusoidal current having a peak value of 100 A, it will read :
- 50 A
 - 15.7 A
 - 63.7 A *
 - 70.7 A
29. If frequency of the applied alternating voltage is doubled, the inductive reactance offered by a pure coil will become
- Half
 - Doubled *
 - One fourth
 - One third
30. The combination of resistance, capacitive reactance and inductive reactance is called
- amplitude factor
 - form factor
 - impedance *
 - time period
31. In a three phase alternator, the number of armature winding is equal to
- one
 - two
 - three *
 - four
32. A three phase alternator produces as many independent voltage wave as the number of
- poles
 - armature winding *
 - brushes
 - sliprings
33. In a two phase alternator, the armature windings are displaced
- 90 electrical degree apart *
 - 120 electrical degree apart
 - 180 electrical degree apart
 - 360 electrical apart
34. In a three phase alternator, the armature windings are displaced
- 90 electrical degree apart
 - 120 electrical degree apart *
 - 180 electrical degree apart
 - 360 electrical apart
35. The reasons for the immense popularity of three phase apparatus are that
- it uses less material for a given capacity and costs more than single phase apparatus
 - It uses more material for a given capacity and costs more than single phase apparatus
 - it uses more material for a given capacity and costs less than single phase apparatus
 - it uses less material for a given capacity and costs less than single phase apparatus *
36. In case of an induction motor, reversal of phase sequence results in
- Unusual noise during motor rotation
 - Stopping of motor rotation
 - Reversed direction of motor rotation *
 - No change in motor rotation
37. The colours used commercially for numbering the phases to indicate phase sequence are
- Red, Yellow, Blue *
 - Red, Black, Blue
 - Green, Yellow, Red
 - Green, yellow, Blue

38. If the three armature coils of the 3 - phase alternator are not interconnected but are kept separate, then each phase or circuit would need minimum
- 1 conductor
 - 2 conductors *
 - 3 conductors
 - 4 conductors
39. In case of a star connection, the phase voltage is equal to
- $\sqrt{3}$ of line voltage
 - line voltage
 - $1/\sqrt{3}$ of line voltage *
 - 3 times of line voltage
40. In case of a star connection, the line current is equal to
- $\sqrt{3}$ of phase current
 - Phase current *
 - $1/\sqrt{3}$ of phase current
 - 3 times of phase current
41. We know $P = \sqrt{3} V_L I_L \cos \phi$ in case of star connection, where ϕ is the angle between
- Phase voltage and phase current *
 - Line voltage and line current
 - Phase voltage and line voltage
 - Phase current and line current
42. In case of a delta connection, the phase voltage is equal to
- 3 times of line voltage
 - $\sqrt{3}$ of line voltage
 - $1/\sqrt{3}$ of line voltage
 - line voltage *
43. In case of a delta connection the line current is equal to
- $\sqrt{3}$ of phase current *
 - phase current
 - $1/\sqrt{3}$ of phase current
 - 3 times of phase current
44. The number of conductors per phase in the windings of an alternator or motor, for a given frequency and flux, is directly proportional to the
- Phase voltage *
 - Phase current
 - Line voltage
 - Line current
45. In a star connected alternator whose neutral point is earthed, and if through fault, line conductor earthed, the insulator will have to bear
- full line voltage
 - $\sqrt{3}$ of line voltage
 - 1/3 of line voltage
 - $1/\sqrt{3}$ of line voltage*
46. The connection which is much used for comparatively small low voltage three phase motors is
- star connection
 - delta connection *
 - combination of star and delta connection
 - none of the above
47. With large motors, pulsating power supply causes
- excessive power loss
 - excessive vibration *
 - smooth running
 - none of the above
48. To transmit a given amount of power at a given voltage at a given distance, 3 phase transmission requires
- $1/2$ the weight of copper of a single phase system
 - Same the weight of copper of a single phase system
 - $1/2$ the weight of copper of a single phase system
 - $3/4$ th the weight of copper of a single phase system*
49. In a 3 ϕ , 4 wire system supplying a balanced load, current in the neutral is
- maximum
 - zero *
 - half of phase current
 - $1/4$ th of phase current
50. Sum of two wattmeter readings gives the
- minimum power consumption in the load
 - apparent power consumption in the load
 - total power consumption in the load *
 - non of the above
51. Three phase power is generally measured by
- one watt meter method
 - two wattmeter method *
 - four wattmeter method
 - six wattmeter method
52. Three equal impedances are first connected in star across a balanced 3 phase supply. If they are now connected in delta across the same supply :
- Phase current will be tripled
 - Phase current will be doubled
 - Line current will become one - third
 - Power factor will be improved *
53. A 3 phase, 4 wire, 230 / 440 V system is supplying lamp load at 230 V. If a 3 phase motor is now switched on across the same supply, then :
- Neutral current will increase
 - All line currents will decrease
 - Neutral current will remain unchanged *
 - Power factor will be improved
54. In the two - wattmeter method of measuring 3 phase power, the two wattmeter indicate equal and opposite readings when load power factor angle is
- 60° lagging
 - 0° lagging
 - 30° lagging
 - 90° lagging *
55. When phase sequence at the 3 phase load is reversed
- Phase powers are changed
 - Phase currents are changed

75. In a multipolar (P-pole) machine running at a speed of N rpm, the frequency of generated emf is given as
 a. $f = PN/60$ b. $f = PN/120^*$
 c. $f = N/P$ d. $f = PN$
76. An ac generator running at 1,000 rpm produces emf of 50 Hz. The number of poles on the generator is
 a. 2 b. 4
 c. 6* d. 8

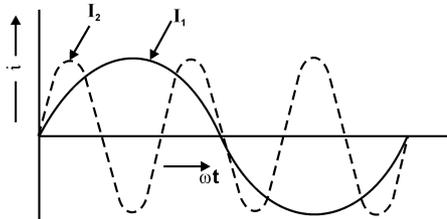


Fig . 2.2

77. Which of the following statements about the two alternating current shown in figure 2.2 is correct?
 a. The peak values of I_1 and I_2 are different.
 b. The rms values of I_1 and I_2 is more than that of current I_1 .
 c. The frequency of current I_1 is more than that of current I_2 . *
78. An insulation is subjected to value of applied alternating voltage to it.
 a. average b. peak *
 c. rms d. double of the peak
79. The average value of an unsymmetrical alternating quantity is calculating over the
 a. whole cycle.*
 b. half cycle.
 c. unsymmetrical part of the waveform.
80. The mean value of the current $i = 20 \sin t$ from $t=0$, to $t = p/2$ is
 a. $40/p$ b. $40/p^*$
 c. $1/40$ d. $p/40$
81. A constant current of 2.8 A exists in a resistor. The rms value of current is

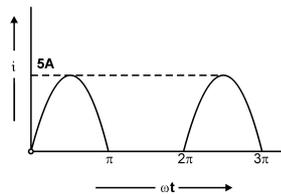


Fig. 2.3

- a. 2.8 A* b. about 2 A
 c. 1.4 A d. undefined
82. The current through a resistor has a waveform as shown in fig.2.3 The reading shown by a moving coil ammeter will be amperes.

- a. $5/\sqrt{2}$ b. $2.5/\sqrt{2}$
 c. $5/p^*$ d. 0
83. An alternating voltage $e = 200 \sin 314 t$ is applied to a device which offers an ohmic resistance of 20 W to the flow of current in one direction while entirely preventing the flow in the opposite direction. The average value of current will be
 a. 5 A. b. 3.18 A.*
 c. 1.57 A. d. 1.10 A.
84. A 50 Hz ac voltage is measured with a moving iron voltmeter and a rectifier type ac voltmeter connected in parallel. If the meter readings are V_1 and V_2 respectively and the meters are free from calibration errors, then the form factor of the ac voltage may be estimated as
 a. V_1/V_2 b. $1.11 V_1/V_2^*$
 c. $2 V_1/V_2$ d. $p V_1/2 V_2$
85. An ac current is given as $i = 10 + 10 \sin 314 t$
 The average and rms value of the current are
 a. 16.36 A, 17.07 A. b. 10 A, 17.07 A.
 c. 10 A, 12.25 A.* d. 16.36 A, 12.2 A.
86. An alternating current is represented as $i = 70.7 \sin (520 t + p/6)$. The frequency and rms value of the current are
 a. 82.76 Hz, 50 A.* b. 41.38 Hz, 25 A
 c. 41.38 Hz, 50 A. d. 82.76 Hz, 25 A
87. The rms value of a half wave rectified current is 50 A. Its rms value for full wave rectification would be
 a. 100 A. b. 70.7 A.*
 c. $\frac{50}{\pi}$ A. d. $\frac{100}{\pi}$ A.
88. Power dissipated in 10 W resistance when a voltage of $100 + 100 \sin 314 t$ is applied across it will be
 a. 2,914 watts. b. 1,500 watts.*
 c. 2,488 watts. d. 2,976 watts.
89. An electric iron is rated as 230 V, 500 W, ac. The value of 230 V refers to
 a. rms value.* b. average value.
 c. peak-value. d. peak to peak value.
90. The rms value of sinusoidal ac voltage is equal to its value at an angle of
 a. $p/6$ radians. b. $p/4$ radians.*
 c. $p/3$ radians. d. $p/2$ radians.
91. The size (cross-sectional area) of a conductor, with regard to the heating effect, is determined on the basis of value of current to be carried by it.
 a. average b. peak
 c. rms* d. peak-to-peak

92. The length of a phasor in a phasor diagram normally represents the value of the alternating quantity.
 a. rms or effective* b. average
 c. peak d. none of these
93. The form factor is the ratio of
 a. average value to rms value.
 b. rms value to average value.*
 c. peak value to rms value.
 d. peak value to average value.
94. The peak factor is the ratio of
 a. average value to rms value.
 b. rms value to average value.
 c. peak value to rms value.*
 d. peak value to average value.
95. The ratio of effective value to average value is called the factor.
 a. form* b. peak
 c. average d. Q-factor
96. The form factor for dc supply voltage is always
 a. zero.
 b. unity.*
 c. infinity.
 d. any value between 0 and 1.
97. The two quantities are said to be in phase with each other when
 a. the phase difference between two quantities is zero degree or radian.
 b. each of them pass through zero values at the same instant and rise in the same direction.
 c. each of them pass through zero values at the same instant but rises in the opposite directions.
 d. each of the them attains maximum values at the same instant.
 e. either (a) or (b).*
98. When the two quantities are in quadrature the phase angle between them will be
 a. 45° or $\pi/4$ radians. b. 90° or $\pi/2$ radians.*
 c. 135° or $3\pi/4$ radians. d. 60° or $\pi/3$ radians.
99. The phase difference between the two wave forms can be compared only when they
 a. have the same frequency.*
 b. have the same peak value.
 c. have the same effective value.
 d. are sinusoidal.
100. If $e_1 = A \sin(\omega t + \phi_1)$ and $e_2 = B \sin(\omega t + \phi_2)$ then
 a. e_2 is leading e_1 by an angle $(\phi_1 - \phi_2)$.
 b. e_1 is lagging e_2 by an angle $(\phi_1 - \phi_2)$.
 c. e_2 is leading e_1 by an angle $(\phi_2 - \phi_1)$.*
 d. e_2 is lagging e_1 by an angle $(\phi_2 - \phi_1)$.
101. Two sinusoidal emfs are given as
 $e_1 = A \sin(\omega t + \pi/4)$ and $e_2 = B \sin(\omega t - \pi/6)$.
 The phase difference between the two quantities indegrees is
 a. 75° * b. 105°
 c. 60° d. 15°
102. A phasor is a line which represents the
 a. rms value and phase of an alternating quantity.*
 b. average value and phase of an alternating quantity.
 c. magnitude and direction of an alternating quantity.
 d. none of the above.
103. The phasor diagram for alternating quantities can be drawn if they have waves.
 a. rectangular b. sinusoidal*
 c. triangular d. any of these
104. Two alternating quantities are added
 a. arithmetically. b. graphically.
 c. vectorial.* d. geometrically
105. If two sinusoids of the same frequency but of different amplitudes and phase difference are added, the resultant is a
 a. sinusoid of the same frequency.*
 b. sinusoid of double the original frequency.
 c. sinusoid of half the original frequency.
 d. non-sinusoid.
106. Two alternating currents represented as $i_1 = 4 \sin \omega t$ and $i_2 = 10 \sin(\omega t + \pi/3)$ are fed into a common conductor. The rms value of resultant current is
 a. 9.62 A. b. 8.83 A.*
 c. 12.48 A. d. 13.60 A.
107. All the rules and laws which apply to dc networks also apply to ac networks consisting of
 a. resistance only.* b. inductance only.
 c. capacitance only. d. all of these.
108. In ac circuits the power curve is a sine wave having
 a. same frequency as that of voltage.
 b. double the frequency of the voltage.*
 c. half of the frequency of the voltage.
 d. none of the above.
109. Ohmic resistance is termed as resistance.
 a. apparent b. inductive
 c. effective* d. capacitive
110. Which of the following statements associated with purely resistive circuits is correct ?
 a. PF is unity.*
 b. Power consumed is zero.
 c. Heat produced is zero.
 d. PF is zero.
111. Electrical power converted into heat due to flow of an alternating current through an ohmic resistance is called the power.
 a. heating b. true*
 c. reactive d. apparent

112. Which of the following statements pertains to resistor only ?
 a. They oppose sudden changes in voltages.
 b. they can act as energy storage devices.
 c. They can dissipate desirable amount of power.*
 d. None of the above.
113. Average power in a pure resistive circuit is equal to
 a. zero.
 b. product of average values of current and voltage.
 c. product of peak values of current and voltage.
 d. product of rms or effective values of current and voltage.*
114. If an alternating triangular voltage is applied to a resistor, the shape of the current waveform will be waveform.
 a. triangular* b. sawtooth
 c. sinusoidal d. square.
115. In a purely resistive circuit, the average power P_{av} is the peak power P_{max} .
 a. double b. one-half of *
 c. one-fourth d. equal to
116. A boiler at home is switched on to the ac mains supplying power at 230 V, 50 Hz. The frequency of instantaneous power consumed is
 a. 0 Hz. b. 50 Hz.
 c. 100 Hz.* d. 150 Hz.
117. The current waveform in a pure resistor of 10 W is shown in the figure:2.4 Power dissipated in the resistor is
-
- Fig:-2.4**
- a. 7.29 W. b. 52.4 W.
 c. 135 W. d. 270 W.*
118. The magnetic field energy in an inductor changes from max. value to min. value in 5m sec when connected to an ac source. The frequency of the source is
 a. 20 Hz. b. 50 Hz.*
 c. 200 Hz. d. 500 Hz.
119. The inductive reactance of a circuit with the increase in supply frequency
 a. increases* b. decreases
 c. remain unchanged d. unpredictable
120. Which of the following statements associated with pure inductive circuit is not true ?
 a. zero pf. b. zero power consumed.
 c. zero heat produced. d. zero current drawn.*
121. In a pure inductive circuit, the current will
 a. lag behind the voltage by 90° *
 b. lead the voltage by 90°
 c. remain in phase with the voltage.
 d. lag or lead the applied voltage.
122. In a purely inductive circuit power is zero.
 a. apparent b. reactive
 c. true* d. inductive
123. If the supply frequency of a purely inductive circuits is doubled, the circuit current will be
 a. halved* b. doubled
 c. same d. one-fourth
124. Purely inductive circuit takes power from the ac mains when
 a. both applied voltage and current increase.
 b. both applied voltage and current decrease.
 c. applied voltage decreases but current increases.*
 d. applied voltage increases but current decreases.
125. Which of the following quantities is not expressed in ohms ?
 a. Resistance. b. Capacitance.
 c. Inductance. d. Inductive reactance.
 e. Capacitive reactance. f. both (b) and (c).*
126. A pure capacitance connected across 50 Hz, 230 V supply consumes 0.04 W. This consumption is attributed to
 a. ohmic loss due to ohmic resistance of plates.
 b. loss of energy in dielectric.
 c. capacitive reactance in ohms.
 d. both (a) and (b).*
 e. The statement is **FALSE**.
127. With the decrease in supply frequency the capacitive reactance of the circuit will
 a. decrease. b. increase.*
 c. remain the same. d. unpredictable.
128. A circuit component that opposes the change in circuit voltage is
 a. resistance. b. capacitance.*
 c. inductance. d. all of the above.
129. An instantaneous change in voltage is not possible in
 a. a resistor. b. an inductor.
 c. a capacitor.* d. a current source.
130. If the supply frequency of a pure capacitive circuit is tripped, the current will be
 a. tripped.* b. one-third.
 c. nine times. d. one-ninth.
131. Capacitive reactance increases with the increase in
 a. capacitance. b. frequency.
 c. voltage. d. none of these.*
132. Which of the following statements associated with a

- pure capacitive circuit is not true ?
- Power consumed is zero.
 - Heat produced is zero.
 - Power factor is unity.*
 - Work done is zero.
 - Power factor is zero.
133. In a pure capacitive circuit, the current will
- lag behind the voltage by 90° .
 - lead the voltage by 90° .*
 - remain in phase with voltage.
 - none of the above.
134. What capacitance will give the same reactance as an inductor of 1H at 50 Hz ?
- 1mF
 - 10 mF *
 - 1 F
 - 10 F
135. A two-terminal black box contains a series combination of a resistor and unknown two-terminals linear device. As soon as the battery is connected to the black box the current is found to be zero. The device is
- an inductor *
 - a capacitor
 - a resistor
 - an unknown
136. The pf of a practical inductor is
- unity
 - zero
 - lagging*
 - leading
137. A circuit zero lagging power factor behaves as
- an inductive circuit.*
 - a capacitive circuit.
 - R-L circuit.
 - R-O circuit.
138. Power loss in an electrical circuit can take place in
- inductance only.
 - capacitance only.
 - inductance and resistance.
 - resistance only.*
139. In an R-L series circuit the power factor is
- leading.
 - lagging.*
 - zero.
 - unity.
140. The power factor of an ordinary electric bulb is
- zero.
 - unity.*
 - slightly more than unity.
 - slightly less than unity.
141. The power factor of an ac circuit is equal to
- cosine of the phase angle.*
 - sine of the phase angle.
 - unity for a resistive circuit.
 - unity for a reactive circuit.
142. While drawing phasor diagram for a series circuit, the reference phasor is
- voltage.
 - current.*
 - resistance.
 - power.
143. In a series R-L circuit
- voltage drops across R and L are in phase.
 - voltage drop across L leads the voltage drop across R by 90° .*
 - voltage drop across L lags behind the voltage drop across R by 90° .
 - voltage drop across R and L are in phase opposition.
144. The voltage applied across an R-L series circuit is equal to the sum of voltage drops across R and L (V_R and V_L).
- arithmetic
 - algebraic
 - phasor*
 - none of these.
145. A resistance is connected in series with an inductive coil. The phase difference between the current I and applied voltage V
- remains the same.
 - increases.
 - decreases.*
146. Skin effect occurs when a conductor carries current at frequencies.
- very low
 - low
 - high*
147. A 100 W, 100 V bulb is to be supplied from 220V, 50 Hz supply. The pure inductance to be connected in series with the bulb, so that it may carry the same current, will be
- 0.625 H*
 - 120 H
 - 0.382 H
 - 0.764 H
148. The power consumed in an ac circuit will be minimum when phase difference between current I and applied voltage V is
- 0°
 - 90° *
 - 180°
 - 30°
149. The power in a single phase ac circuit is given but
- VI.
 - $V I \sin F$.
 - $V I \cos F$ *
 - $I^2 Z$.
 - $I^2 X_L$
 - none of above.
150. An average power in an ac circuit is given by the expression
- $V_{rms} I_{rms} \cos F$ *
 - $V_{av} \times I_{av}$
 - $V_{max} I_{max} / 2$
 - $V_{max} I_{max} \cos F$
151. Power factor of an ac circuit is defined as the ratio of
- resistance and reactance.
 - resistance and impedance.*
 - reactance and impedance.
 - reactance and resistance.
152. In an ac circuit the applied voltage and current drawn are represented as $v = V_{max} \sin \omega t$ and $i = I_{max} \sin (\omega t + F)$ The pf of the circuit is
- $\sin F$.
 - $\cos F$ (lagging).
 - $\cos F$ (leading) *
 - none of these.
153. The power factor of an circuit lies between
- 0 and 1.*
 - 1 and 1.
 - 0 and -1.
 - none of these.

154. The pf of an ac circuit is given as
 a. sin of the phase angle.
 b. cosine of the phase angle.*
 c. tangent of the phase angle.
 d. Q-factor of circuit.
155. The pf of an ac circuit is equal to ratio of
 a. resistance and impedance (R/Z).
 b. true power and apparent power (kw/kva).
 c. useful (wattful) current to the total current.
 d. any of the above.*
156. In an ac circuit $I \cos F$ is called the
 a. watt less or reactive component of current.
 b. quadrature component of current.
 c. active or useful or wattful component of current.*
 d. none of the above.
157. In an ac circuit $I \sin F$ is called the component of current.
 a. watt less. b. reactive.
 c. quadrature. d. any of these*
158. An ac source having voltage $E = 110 \sin (wt + p/3)$ is connected in an ac circuit. If the current drawn from the circuit varies as $i = 5 \sin (wt - p/3)$ the impedance of the circuit will be
 a. 22 W* b. 16 W
 c. 30.8 W d. none of these
159. A series circuit containing passive elements has the following current and applied voltage $v = 200 \sin (2,000 + 50^\circ)$, $i = 4 \cos (2,000 t + 13.2^\circ)$. The circuit elements
 a. must be resistance and capacitance.
 b. must be resistance and inductance.
 c. must be inductance, capacitance and resistance.
 d. could be either resistance and capacitance or resistance, inductance and capacitance.*
160. Which are the following true of the circuit shown in the fig-2.5
 1. $V_R = 100\sqrt{2}$ V
 2. $I = 2$ A
 3. $L = 0.25$ H
 Select the correct answer using the codes given below:

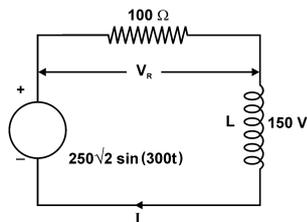


Fig. 2.5

Codes.

- a. 2 and 3* b. 1 and 2
 c. 1 and 3 d. 1, 2 and 3
161. A leading power factor implies that
 a. current leads that voltage.*
 b. current lags behind the voltage.
 c. voltage leads the current.
 d. none of the above.
162. In an ac circuit the ratio of active power to apparent power is called the factor.
 a. form b. load
 c. power* d. Q-
163. The product of apparent power and sin of the phase angle between circuit voltage and current is called the power.
 a. true b. reactive
 c. watt less d. any of (b) and (c)*
164. In an ac circuit, low reactive power in comparison to true power indicates
 a. low power factor. b. low efficiency.
 c. high power factor.* d. high efficiency.
165. Which of the following relations between apparent power (kva), true power (kw) and reactive power kvar is true ?
 a. $kva = \sqrt{(kw)^2 + (kvar)^2}$ *
 b. $kva = kw + kva r$
 c. $kva = \sqrt{(kw)^2 - (kvar)^2}$
 d. $kva = kw - kva r$
166. Which of the following devices draws inductive reactive power also ?
 a. Filament lamp b. Electric heater.
 c. Induction motor.* d. All of these.
167. The rating given on the name plate of a transformer indicates the
 a. true power which it can supply.
 b. apparent power which it can supply.*
 c. apparent power which it draws from the supply mains.
 d. true power which it draws from the supply mains.
168. The heat developed in an electric iron is attributed to power.
 a. apparent b. reactive
 c. true* d. true and reactive
169. Q-factor of a coil is measure of its
 a. selectivity.* b. retentivity.
 c. resistivity. d. self inductance.
170. Effective resistance of an iron-cored choke coil is its ohmic resistance.
 a. equal to b. more than*
 c. less than
171. In a highly capacitive circuit the actual power will be
 a. lesser than reactive power.*
 b. larger than reactive power.
 c. equal to apparent power.

- d. equal to reactive power.
172. A square wave is fed to an R-C circuit. Then
- voltage across R is square and across C is not square.
 - voltage across C is square and across R is not square.
 - voltage across both R and C is square.
 - voltage across both R and C is not square.*
173. For a series R-C circuit V_R is measured to be 4 V and V_C is measured as 3 V. The ac source voltage will be
- 7V
 - 4V
 - 5 V*
 - 1 V
174. In a series R-C circuit current _____ with the increase in frequency.
- increases*
 - decrease
 - remains unaltered
175. At very high frequencies a series R-C circuit behaves as almost purely _____ circuit.
- capacitive
 - resistive*
 - inductive
176. At very low frequencies a series R-C circuit behaves as almost purely _____ circuit.
- inductive
 - resistive
 - capacitive.*
177. A 100 W, 100 V bulb is to be supplied from 220 V, 50 Hz supply. Which of the following arrangements is preferable ?
- Additional pure inductance in series with lamp.*
 - Additional resistance in series with the lamp.
 - Additional inductance and capacitance in series with the lamp.
178. Ohm's law, in general form, also valid for ac is
- $I = V/R + X$
 - $I = V/\sqrt{R^2 + X^2}$
 - $I = V/Z^*$
 - $I = V/\sqrt{R^2 - X^2}$
179. When an inductor and capacitor are in series in an ac circuit, the phase angle between voltage drops across them will be
- 0° .
 - $\pi/2$ radians.
 - π radians.*
 - $\pi/4$ radians
180. The phasors for which of the following pairs are in phase opposition ?
- V_L and V_R .
 - V_C and V_R
 - V_L and V_C .*
 - none of these.
181. A series R-L-C circuit with $R = 5\Omega$, $L = 1$ henry and $C = 1$ farad is connected to voltage source $e(t) = 10 \sin t$. For such a circuit
- the supply voltage leads the current by 90° .
 - The supply voltage and current are in phase.*
 - the supply voltage and current are out of phase of 180° .
 - nothing can be said about phase relation.

182. A two terminal black box contains one of the R-L-C elements. The black box is connected to a 220 V ac supply. The current through the source is 1. When a capacitance of 0.1 F is inserted in series between the source is 2 I. The element is
- a resistance
 - an inductance*
 - a capacitance.
 - it is not possible to determine the element.
183. In the following circuit $i(t)$ under steady state is (Ref.fig-2.6)
- zero
 - 5
 - $7.07 \sin t$
 - $7.07 \sin(t-45^\circ)$ *

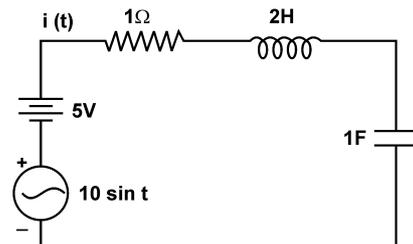


Fig-2.6

184. The source in the circuit shown is a sinusoidal source (Ref.fig-2.7). The supply voltage across various elements are marked in the figure. The input voltage is
- 10V
 - 5 V*
 - 27V
 - 24V

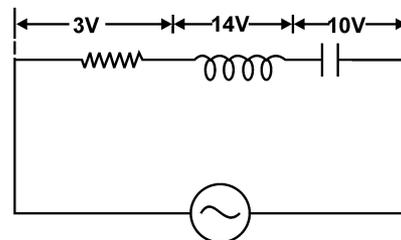


Fig-2.7

185. In the circuit shown in the given figure, if the power consumed by the 5 W resistor is 10 W, then the pf of the circuit is
- 0.8
 - 0.6*
 - 0.5
 - zero

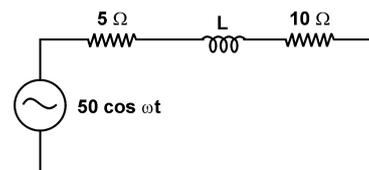


Fig -2.8

186. In an RLC circuit, supplied from an ac source, the reactive power is proportional to the
- average energy stored in the electric field.
 - average energy stored in the magnetic field.
 - sum of the average energy stored in the electric

field and that stored in the magnetic field.

- d. difference between the average energy stored in the electric field and that stored in the magnetic field.*

187. If a series RLC circuit excited by a voltage $e = E \sin \omega t$ where $LC < 1/\omega^2$
- a. current lags behind the applied voltage.
 - b. current leads the applied voltage.*
 - c. current is in phase with the applied voltage.
 - d. voltage across L and C are equal.

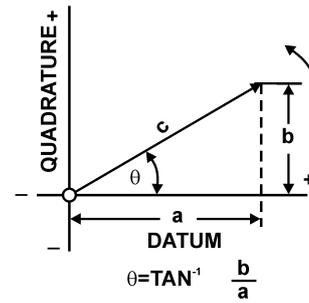


Fig. 2.9

188. If in an R-L-C series circuit the supply current lags behind the applied voltage by 60° then
- a. $X_L - X_C = R/\sqrt{3}$
 - b. $X_L - X_C = \sqrt{3} R^*$
 - c. $R = X_L - X_C$
 - d. $X_L = X_C$

189. A small capacitance is added to a highly inductive circuit,
- a. the angle between voltage and current will increase.
 - b. the p f will increase.*
 - c. the p f will decrease.
 - d. the power drawn will decrease.

190. In an R-L-C circuit
- a. power is consumed in resistance only and is equal to $I^2 R$.
 - b. exchange of power does not take place between resistance and supply mains.
 - c. exchange of power takes place between capacitor and supply mains.
 - d. all of the above.*

191. The symbol j represents rotation of a phasor degrees.
- a. clockwise, 90°
 - b. clockwise, 180°
 - c. counter-clockwise, 90° *.
 - d. counter-clockwise, 90°

192. The operator j has a numerical value of
- a. $\sqrt{-1}$ *
 - b. $\sqrt{+1}$
 - c. -1
 - d. 1

193. The numerical value of operator j^2 is equal to
- a. +1
 - b. -1*
 - c. zero
 - d. j^5

194. The phasor C can be represented in symbolic or rectangular form as
- a. a + b
 - b. ab
 - c. a + jb*
 - d. $\sqrt{a^2 + b^2}$

195. The phasor C can be represented in polar form as
- a. $ab \angle \phi$
 - b. $\sqrt{a^2 + b^2} \angle \phi$ *
 - c. $(a^2 + b^2) \angle \phi$
 - d. $(a + b) \angle \phi$

196. The phasor C can be represented in trigonometrical form as
- a. $(a \cos \phi + j b \sin \phi)$
 - b. $(a + b) (\cos \phi + j \sin \phi)$
 - c. $\sqrt{a^2 + b^2} (\cos \phi + j \sin \phi)$ *
 - d. $ab (\cos \phi + j \sin \phi)$

197. The phasor C can be represented in exponential form as
- a. $\sqrt{a^2 + b^2} e^{j\phi}$ *
 - b. $(a + b)e^{j\phi}$
 - c. $(a^2 + b^2) e^{j\phi}$
 - d. $e^{(a + jb)}$.

198. The conjugate of $(-a - jb)$ is
- a. $(-a + jb)$ *
 - b. $(a + jb)$
 - c. $a - jb$
 - d. $(-jb - a)$

199. $a e^{j\phi}$ is equal to
- a. $a e^{j(p n + q)}$
 - b. $a e^{j(2pn + q)}$ *
 - c. $a e^{j(2pnq)}$
 - d. $a e^{j(q/2pn)}$
- where n is a positive integer.

200. The product of $(a + jb)$ and $(c - jd)$ is equal to
- a. $ac - bd$
 - b. $(ac - bd) + j(bc + ad)$
 - c. $(ac + bd) + j(bc - ad)$ *
 - d. $ac - jbd$

201. The product of $a \angle \phi$ and $b \angle \phi$ is equal to
- a. $a b \angle \phi - b^*$
 - b. $a b \angle \phi + b$
 - c. $(a + b) \angle \phi - b$
 - d. $(a - b) \angle \phi + b$

202. In above question a/b will be equal to
- a. $a b \angle \phi - b$
 - b. $a/b \angle \phi + b^*$
 - c. $(a - b) \angle \phi - b$
 - d. $(a + b) \angle \phi + b$

203. Real part of admittance is and the imaginary part is
- a. impedance, resistance.
 - b. resistance, impedance.
 - c. susceptance, inductance.
 - d. conductance, susceptance.*

204. In an ac circuit if voltage $V = (a + jb)$ and current $I = (c + jd)$, then the power is given by
 a. $ac + ad$ b. $ac + bd^*$
 c. $bc - ad$ d. $bc + ad$
205. In a parallel R-L circuit if I_R is the current in resistor and I_L is the current in the inductor, then
 a. I_R lags I_L by 90°
 b. I_R leads I_L by 270°
 c. I_L leads I_R by 270°
 d. I_L lags I_R by 90° *
206. In a parallel R-C circuit, the current always the applied voltage
 a. remains in phase with
 b. lags behind
 c. leads*
 d. none of the above.
207. Parallel R-C circuit behaves as purely capacitive circuit at frequencies.
 a. very low b. low
 c. high d. very high*
208. In an R-L-C parallel circuit, admittance is defined as the reciprocal of
 a. resistance b. reactance
 c. impedance* d. susceptance.
209. While drawing a phasor diagram for a parallel circuit is taken as reference phasor.
 a. current b. voltage*
 c. power d. none of these
210. For connecting two voltage sources in parallel, which of the parameters should be equal ?
 a. Phase and magnitude.
 b. Frequency and magnitude.
 c. Phase and frequency.
 d. Frequency, phase and magnitude.*
211. In an R-L-C circuit susceptance is equal to
 a. $1/X$ b. $1/R$
 c. X/Z^2 * d. R/Z^2
212. The unit of susceptance is
 a. farad. b. ohm.
 c. henry. d. mho.*
213. Capacitive susceptance is a measure of
 a. a purely capacitive circuit's ability to pass current.*
 b. a purely capacitive circuit's ability to resist the flow of current.
 c. the extent of neutralization of reactive power in a circuit.
 d. reactive power in a circuit.
214. In the circuit shown in the figure-2.10, the voltmeter indicates 30 V. The reading of the ammeter will be

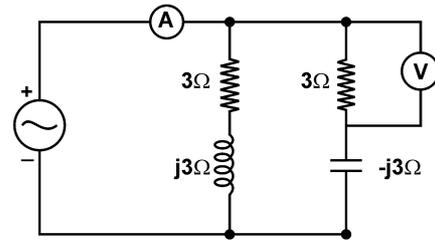


Fig:-2.10

- a. 20 A. b. $10\sqrt{2}$ A.*
 c. 10 A. d. zero.
215. Power factor of an inductive circuit is usually improved by adding a capacitor to it in
 a. series
 b. parallel*
 c. either in series or in parallel.
216. The current read by the ammeter A in the ac circuit shown in the fig-2.11 is

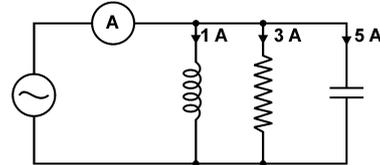


Fig-2.11

- a. 9 A b. 5 A*
 c. 3 A d. 1 A
217. In the circuit shown in the fig-2.12 $V_s = V_m \sin 2t$ and $Z_2 = 1 + j1$ the value of C is chosen such that the current I is in phase with V_s . The value of C (in farads) is
 a. $1/4$ * b. $1/2\sqrt{2}$
 c. 2 d. 4
218. Consider the following statements with respect to a series R-L-C circuit under resonance condition:
 1. All the applied voltage appears across R.
 2. There is no voltage across either L or C.
 3. The voltage across L and C equal and equal to their maximum values. Of these statements.
 a. 1 alone is correct.* b. 2 alone is correct.
 c. 1 and 3 are correct. d. 1 and 2 are correct.
219. A series R-L-C circuit will have unity power factor if operated at a frequency of
 a. $1/LC$ b. $1/\omega\sqrt{LC}$
 c. $1/\omega^2 LC$ d. $1/2\pi\sqrt{LC}$ *
220. The resonant frequency of the series circuit shown in the fig-2.12 is

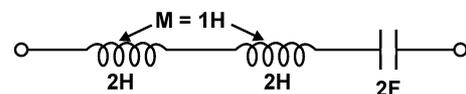


Fig:-2.12

- a. $\frac{1}{4\pi}$ Hz b. $\frac{1}{4\pi\sqrt{2}}$ Hz
- c. $\frac{1}{2\pi\sqrt{2}}$ Hz d. $\frac{1}{4\pi\sqrt{3}}$ Hz *
221. In a series R-L-C circuit, magnitude of resonance frequency can be changed by changing the value of
- a. R only. b. L only.
c. C only. d. L or C*
e. R, L or C
222. In a series R-L-C circuit at resonance
- a. impedance is maximum.
b. admittance is maximum.*
c. impedance is purely reactive.
d. current is minimum.
223. A series-resonant circuit implies
- a. zero pf and maximum current.
b. unity pf and maximum current.*
c. unity pf and minimum current.
d. zero pf and minimum current.
224. Consider the following statements:
In a network of resonance
- the admittance is maximum.
 - the power factor is unity irrespective of the network.
 - the Q of a series RLC resonant circuit is independent of R. Of these statements
- a. 1 and 3 are correct.
b. 1 and 2 are correct.*
c. 2 and 3 are correct.
d. 1 alone is correct.
225. A coil having a resistance of 5 W and inductance of 0.1 H is connected in series with a condenser of capacitance 50 Wm. A constant alternating voltage of 200 V is applied to the circuit. The voltage across the coil at resonance is
- a. 200 volts. b. 1,788 volts.
c. 1,800 volts.* d. 2,000 volts.
226. A circuit with a resistor, inductor and capacitor in series is resonant of f_0 Hz. If all the component values are now doubled, the new resonant frequency is
- a. $2f_0$ b. still f_0
c. $f_0/4$ d. $f_0/2$ *
227. In a series resonant circuit the impedance below resonant frequency is
- a. capacitive.*
b. inductive
c. resistive.
d. depends upon the values of circuit components.
228. In a series resonant circuit the impedance above resonant frequency is
- a. capacitive b. resistive
- c. inductive* d. none of these.
229. When frequency is must higher than resonance (i.e. $f \gg f_0$), the angle of impedance Z approaches
- a. 0° b. $+90^\circ$ *
c. -90° d. 180°
230. In a series resonant circuit, the magnification of current is
- a. unity.* b. zero.
c. L/R. d. wL/R.
231. A series R-L-C circuit, consisting of R = 10 ohms, $X_L = 20$ ohms and $X_C = 20$ ohms is connected across an ac supply of 100 V(rms). The magnitude and phase angle with reference to supply voltage. of the voltage across the inductive coil are respectively
- a. 100 V; 90° b. 100 V; -90°
c. 200 V; -90° d. 200 V; 90° *
232. In a series R-L-C circuit, the voltage across inductance will be maximum
- a. at resonant frequency.
b. just after resonant frequency.*
c. just before resonant frequency.
d. just before and after resonant frequency.
233. In a series resonant circuit, the voltage across the circuit is the same as the voltage across the
- a. resistance* b. inductance
c. capacitance d. none of these
234. Which of the following coils will have large resonant frequency ?
- a. A coil with low resistance.
b. A coil with large resistance.
c. A coil with large distributed capacitance.
d. A coil with low distributed capacitance.*
235. The point to be kept in mind with series resonance is
- a. the current is practically zero.
b. the current can increase infinitely.
c. the voltage across resistance can be come must larger than applied voltage.
d. the voltage across the coil and across the capacitor becomes must larger than the voltage applied.*
236. A series circuit having a resonant frequency of 60 KHz is connected in series with a signal generator which produces signals of frequency 20, 30, 40 and 60 KHz. The signals experiencing minimum and maximum impedances will be
- a. 60 KHz and 20 KHz respectively.*
b. 20 KHz and 60 KHz respectively.
c. 30 KHz and 60 KHz respectively.
d. 20 KHz and 40 KHz respectively.
237. The frequency at which maximum voltage occurs across the inductance in an R-L-C circuit is
- a. $1/2\pi\sqrt{LC}$

- b. $1/2\pi\sqrt{LC - C^2R^2/2}$ *
- c. $\frac{1}{2\pi}\sqrt{\frac{1}{LC} - \frac{R^2}{2L^2}}$
- d. $1/2\pi\sqrt{LC - R^2}$
238. The frequency at which maximum voltage occurs across the capacitor in an R-L-C circuit is
- a. $1/2\pi\sqrt{LC}$
- b. $1/2\pi\sqrt{LC - C^2R^2/2}$
- c. $\frac{1}{2\pi}\sqrt{\frac{1}{LC} - \frac{R^2}{2L^2}}$ *
- d. $1/2\pi\sqrt{LC - R^2}$
239. A resonance curve for a series circuit is plot of frequency against
- a. current.* b. voltage.
- c. impedance. d. resistance.
240. For sharp rise in current, in case of R-L-C series resonant circuit, R should be
- a. high. b. medium.
- c. low.* d. equal to \sqrt{LC} .
241. The quality factor R-L-C circuit will increase if
- a. R decreases.* b. R increases.
- c. voltage increases.
242. A high Q coil has
- a. large bandwidth. b. high losses.
- c. low losses.* d. flat response.
243. When Q-factor of a circuit is high, then
- a. power factor of the circuit is high.
- b. impedance of the circuit is high.
- c. bandwidth is large.
- d. none of these.*
244. Consider the following statements regarding the frequency response curve of a series R-L-C circuit.
- At half power frequencies, the current in the circuit is one-half of the current at resonant frequencies.
 - At half-power frequencies, the power factor angle of the circuit is 45°
 - At resonant frequency, the power factor angle of the circuit is 90° .
 - Maximum power occurs at resonant frequency.
- Of these statements
- a. 1, 2 and 4 are correct
- b. 1, 2 and 3 are correct
- c. 2 and 4 are correct *
- d. 1 and 4 are correct
245. The band width of a resonant circuit is given by
- a. $\frac{R}{2\pi L}$ Hz b. $\frac{f_r}{Q}$ Hz.
- c. $\frac{2\pi R}{L}$ Hz. d. $2p f_r/Q$ Hz.
- e. both (a) and (b).*
246. In a series resonant circuit, with the increase in L
- a. resonant frequency will decrease.
- b. band width will decrease.
- c. Q will increase.
- d. all of the above.*
247. In a series resonant circuit with the increase in the value of C
- a. resonant frequency will decrease.
- b. Q will decrease
- c. band width will increase.
- d. both (a) and (b).*
248. Which of the following will not be affected due to change in R ?
- a. Bandwidth b. Q.
- c. Resonant frequency.* d. None.
249. Change in circuit voltage will affect
- a. resonant frequency. b. Q.
- c. current.* d. bandwidth.
250. Higher the Q of a series circuit, narrower its
- a. passband. b. resonance curve.
- c. bandwidth. d. all of these.*
251. An R-L-C series circuit has f_1 and f_2 as the half power frequencies and f_0 as the resonant frequency. The Q-factor of the circuit is given by
- a. $f_1 + f_2/2f_0$ b. $f_1 - f_0/f_2 - f_0$
- c. $f_0/f_1 - f_2$ * d. $f_1 - f_2/f_0$
252. An R-L-C circuit has a resonant frequency of 500 KHz and Q of 50. The bandwidth between half power points will be
- a. 10 KHz between 500 and 510 KHz.
- b. 10 KHz between 495 and 505 KHz.*
- c. 10 KHz between 495 and 500 KHz.
- d. 20 KHz between 490 and 510 KHz.
253. At half power points of an R-L-C series circuit
- a. $R = X_L - X_C$ * b. $X_L = X_C$
- c. $R = 0$ d. $X_L = 2 X_C$
254. Resonant frequency f_r of a series R-L-C circuit is related to half power frequencies f_1 and f_2 as
- a. $f_r = f_1 + f_2/2$ * b. $f_r = \sqrt{f_1 f_2}$.
- c. $f_r = f_2 - f_1$ d. $f_r = \sqrt{f_1} + \sqrt{f_2}$
255. The power factor of an R-L-C series circuit at its half power points is

- a. zero
- b. unity.
- c. leading.
- d. lagging.
- e. either leading or lagging.*

256. At half-power points of a resonance curve, the current is current at resonance.

- a. the same as
- b. half of
- c. $1/\sqrt{2}$ times of*
- d. $\sqrt{2}$ times of

257. The power dissipated at the half power points is power dissipated at resonance.

- a. the same as
- b. half of*
- c. $1/\sqrt{2}$ time of
- d. $\sqrt{2}$ time of

258. The frequency range between two half power frequencies is called the

- a. bandwidth.*
- b. selectivity.
- c. damping coefficient.
- d. none of these.

259. The ability of a resonant circuit to discriminate between one particular frequency and all of others is known as the

- a. bandwidth.
- b. selectivity.*
- c. Q-factor.
- d. none of these.

260. An R-L-C series circuit has f_1 and f_2 as the half power frequencies and f_r as the resonant frequency. The selectivity of the circuit is given by

- a. $f_1 + f_2/f_r$
- b. $f_2 - f_1/2f_r$
- c. $f_2 - f_1/f_r$ *
- d. none of these.

261. In an R-L-C series resonant circuit, if inductance of the circuit is made double and the capacitance is made half, which of the following will be affected ?

- a. Resonant frequency.
- b. Selectivity of the circuit.*
- c. Current at resonant frequency.
- d. Impedance at resonant frequency.

262. As the Q-factor of an R-L-C series resonant circuit increases, its selectivity becomes

- a. better.*
- b. worse.
- c. narrower.
- d. none of these.

263. At resonance, the parallel circuit of fig-2.13 constituted by an iron-cored coil and a capacitor behaves like:

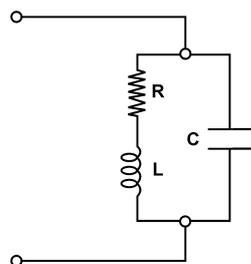


Fig-2.13

- a. an open-circuit
- b. a short-circuit
- c. a pure resistor of value R.

d. a pure resistor of value much higher than R.*

264. The following circuit resonates at (Ref. fir-2.14)

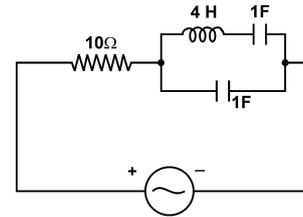


Fig-2.14

- a. all frequencies
- b. 0.5 rad/s*
- c. 5 rad/s
- d. 1 rad/s

265. In an R-L-C parallel circuit, the line current at resonance is

- a. minimum at unity power factor.*
- b. minimum at lagging pf.
- c. maximum at leading pf.
- d. maximum at lagging pf.

266. The currents flowing in L and C branches of an R-L-C parallel circuit at resonance are

- a. zero.
- b. infinite.
- c. equal*
- d. different

267. When resonant frequency for an R-L-C parallel circuit is given by $1/2\pi\sqrt{LC}$, the essential condition is that

- a. inductance must be non-resistive.
- b. capacitance must be non-leaky.
- c. current is minimum at resonance.
- d. all of the above.*

268. In a parallel resonant circuit, the current through capacitor is

- a. zero
- b. less than line current.
- c. equal to line current.
- d. more than line current.*

269. The dynamic resistance of a parallel resonant circuit is given by

- a. LC/R_L
- b. LCR_L
- c. C/LR_L
- d. L/CR_L *

270. A choke coil of inductance L and series resistance R is shunted by a capacitor C. The dynamic impedance of the resonant circuit would be

- a. R/LC
- b. C/RL
- c. L/RC *
- d. $1/RLC$

271. An R-L-C parallel circuit in resonance will

- a. have a high impedance.*
- b. act like a resistor of low value.
- c. have current in each branch equal to that of line current.
- d. produce lot of noise and heat.

272. A parallel resonant circuit can be employed

- a. as a high impedance.

- b. to reject a small band of frequencies.*
 - c. to amplify certain frequencies.
 - d. to amplify voltage.
 - e. both (a) and (b).
273. The point to be kept in mind with parallel resonance is
- a. a very high voltage appears across the capacitor.
 - b. a very high voltage appears across the inductive coil.
 - c. although the line current is small but the current passing through inductive and capacitance branches is very high.
 - d. all of the above.*
274. Q-factor of a parallel resonant circuit is
- a. $2pf_r / \text{band width}$
 - b. $2 p \times \text{maximum stored energy/energy dissipated per cycle.}$
 - c. maximum stored energy/energy dissipated per cycle.*
 - d. none of the above.
275. Like a series R-L-C resonant circuit, a parallel resonant circuit also
- a. magnifies current.
 - b. offers minimum impedance.
 - c. draws maximum current.
 - d. has unity power factor.*
276. In series as well as parallel resonant circuit, increase in resistance would cause
- a. increase in bandwidth of both the circuits.
 - b. decrease in bandwidth of both the circuits.*
 - c. decrease in bandwidth in series circuit and increase in bandwidth in parallel circuit.
 - d. increase in bandwidth in series circuit and decrease in bandwidth in parallel circuit.
277. At a frequency more than resonant frequency
- a. both of the series and parallel circuits are capacitive.
 - b. both of the series and parallel circuits are inductive.
 - c. series circuit is inductive and parallel circuit is capacitive.*
 - d. series circuit is capacitive and parallel circuit is inductive.
278. Which of the following parameters has minimum value in series resonant circuit and maximum in parallel resonant circuit ?
- | | |
|-----------------|--------------------------|
| a. Impedance* | b. Current |
| c. Power factor | d. Voltage magnification |
279. A sinusoidal source of voltage V and frequency, f is connected to a series circuit of variable resistance, R, and a fixed reactance, X. The locus of the tip of the current phasor, I, as R is varied from 0 to ∞ is
- a. a semi-circle with a diameter of V/X .*
 - b. a straight line with a slope of R/X .
 - c. an ellipse with V/R as major axis.
 - d. a circle of radius R/X and origin at $(0, V/2)$.

280. The figure-2.15 indicates the locus for the total current I taken by a two-branch parallel circuit fed from a constant voltage ac source V, when one element of the circuit is varied. Each branch contains two element (R, L or C) in series. Consider the following combinations
1. Fixed R and C
 2. Fixed R and variable L.
 3. Variable R and Fixed R.
 4. Fixed R and variable C.

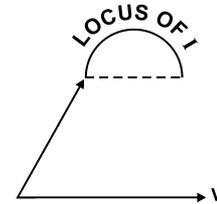


Fig-2.15

- The arrangements at the two branches are respectively.
- a. 1 and 2
 - b. 2 and 3
 - c. 1 and 4*
 - d. 2 and 4

281. The admittance locus of the circuit shown in figure-(2.16) is

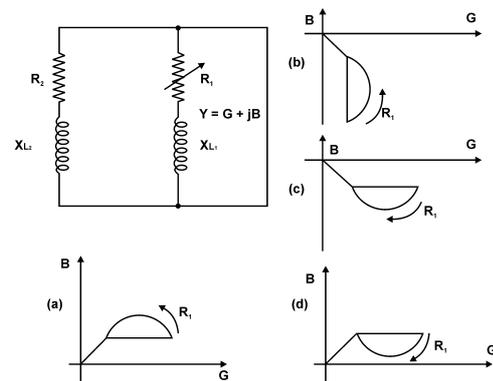


Fig-2.16

282. If all the element in a particular network are linear, then the superposition theorem would hold when the excitation is
- a. dc only
 - b. ac only
 - c. either ac or dc*
 - d. an impulse
283. The V-I relation for the network shown in (Fig-2.17)the given box is $V = 41-9I$. If now a resistor $R = 2 \Omega$ is connected across it, then the value of I will be

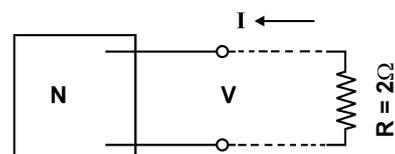


Fig-2.17

- a. -4.5 A
- b. -1.5 A
- c. 1.5 A
- d. 4.5 A*

284. For the circuit shown in figure-2.18, the Thevenin equivalent impedance across terminals CD is given by

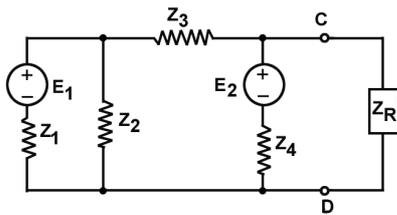


Fig-2.18

- a. $Z_{TH} = \frac{Z_4 \left[\frac{Z_1 Z_2}{Z_1 Z_2} + Z_3 \right]}{Z_4 + Z_3 + \frac{Z_1 Z_2}{Z_1 + Z_2}} *$
- b. $Z_{TH} = \frac{Z_4 \left[\frac{Z_3 Z_2}{Z_3 Z_2} + Z_1 \right]}{Z_1 + Z_4 + \frac{Z_3 Z_2}{Z_3 + Z_2}}$
- c. $Z_{TH} = \frac{Z_1 + Z_2 + Z_2 Z_3}{Z_1 + Z_2 + Z_4}$
- d. $Z_{TH} = \frac{Z_3 + (Z_1 + Z_2 Z_4)}{Z_1 + Z_2 + Z_3 + Z_4}$

285. Consider the following statements: The transfer impedance and admittance of a network remain constant when the position of excitation and response are interchanged if the network

1. is linear.
 2. consist of bilateral elements.
 3. has high impedance or admittance as the case may be.
 4. is resonant.
- Of these statements
- a. 1 and 2 are correct.*
 - b. 1, 3 and 4 are correct.
 - c. 2 and 4 are correct.
 - d. 1, 2, and 4 are correct.

286. In a linear network, the ratio of voltage excitation to current response is unaltered when the position to excitation and response are interchanged. The assertions stems from the

- a. principle of duality.
- b. reciprocity theorem.*
- c. principle of superposition.
- d. equivalence theorem.

287. An ac source of voltage E_s and an internal impedance of $Z_s = (R_s + j X_s)$ is connected to a load of impedance $Z_L = (R_L + j X_L)$. Consider the following conditions in this regard.

1. $X_L = X_s$ if only X_L is varied.
2. $X_L = X_s$ if only X_L is varied.

3. $R_L = \sqrt{R_s^2 + (X_s + X_L)^2}$ if only R_L is varied.
4. if the magnitude of Z_L is varies, keeping the phase angle fixed. Among these conditions, those which are to be satisfied for maximum power transfer from the source to the load would include.
 - a. 2 and 3
 - b. 1 and 3
 - c. 1, 2 and 4
 - d. 2, 3 and 4*

288. Under the conditions of maximum power transfer from an ac source to a variable load

- a. the load impedance must also be inductive, if the generator impedance is inductive.
- b. the sum of the source and the load impedance is zero.
- c. the sum of the source reactance and load reactance is zero.*
- d. the load impedance has the same phase angle as the generator impedance.

289. The generator with internal impedance of $5 + j10$ has a voltage $230 \angle 0^\circ$ across its terminals a b as shown in the figure given below. A load is connected across terminals a b. For maximum power to be transmitted by the generator to the load, the impedance of the load to be connected across a b should be

- a. $+j10$
- b. $5 - j10*$
- c. $-5 - j10$
- d. 15

290. Power delivered to load resistance R_L shown in figure given below will be maximum when R_L is

- a. very high
- b. 5 W
- c. 2.5 W
- d. zero.*

291. Consider the circuit shown in the given figure. For maximum power transfer to the load, the primary to secondary turn ratio must be

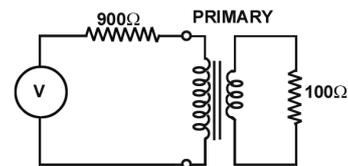


Fig-2.19

- a. 9:1
- b. 3:1*
- c. 1:3
- d. 1:9

292. In two phase system phase voltage differ by

- a. 60°
- b. $90^\circ*$
- c. 120°
- d. 180°

293. In a 3-phase system the emf are

- a. 30° apart
- b. 40° apart
- c. 90° apart
- d. 120° apart*

294. The instantaneous values of currents in phases R and Y of a 3-phase system are 25 A each. For a phase sequence of BRY, the instantaneous value of current in phase B is

- a. 25 A b. 50 A*
- c. 12.5 A d. 43.3 A
295. When phase sequence at the 3-phase load is reversed
- phase currents are changed in phase angle but not in magnitude.
 - phase currents change in phase angle but not in magnitude.*
 - total power consumed is changed.
 - phase powers are changed.
296. Which of the following are the necessary conditions for an entire 3-F system to be balanced ?
- The line voltage are equal in magnitude.
 - The phase differences between successive line voltages are equal.
 - The impedance in each of the phase are identical.
- Select the correct answer using the codes given below:
Codes :
- 1, 2 and 3*
 - 1 and 3
 - 1 and 2
 - 2 and 3
297. In a balanced 3-phase star-connected system E_{RY} lags behind E_B by..... electrical degrees.
- 60°
 - 90° *
 - 120°
 - 150°
298. In a 3-phase, 4-wire load circuit shown (in Fig-2.20), line voltage is indicated by arrow

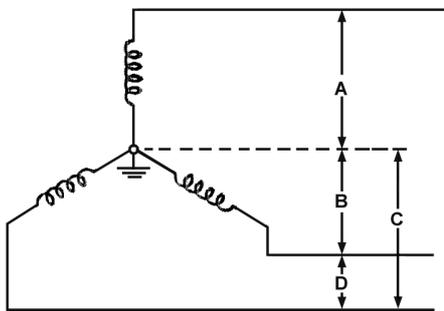


Fig-2.20

- A
 - B.
 - C.
 - D.*
299. If the R-phase of a 3-phase star connected alternator becomes reversely connected by mistake, it will affect
- E_{RY}
 - E_{YB} and E_{BR}
 - E_{RY} and E_{BR} *
 - E_{RY} , E_{YB} and E_{BR}
300. In a 3-phase balanced star-connected load, neutral current is equal to
- zero*
 - I_p
 - I_L
 - unpredictable
301. Which of the following equations is valid for a 3-phase 4-wire balanced star-connected load ?
- $I_R + I_Y + I_B = I_N = 0$ *
 - $I_R + I_Y - I_B = I_N$
 - $I_R - I_Y + I_B = I_N$
 - $V_B + V_R + V_Y / Z = I_N$
302. Lamp load is being supplied from a 3-phase, 4-wire, 230/400 V ac supply system. If a 3-phase motor is now switched on across the same supply, then neutral current will
- increase
 - decrease.
 - remain unchanged.*
 - unpredictable.
303. Which of the following statements associated with 3-phase delta connected circuits is TRUE ?
- line voltage is equal to phase voltage.*
 - line current is equal to phase current.
 - line voltage is $\sqrt{3}$ time of phase voltage.
 - line currents are 60° apart.
304. The relationship between the line and phase voltage of a delta-connected circuit is given by
- $V_L = V_p$ *
 - $V_L = \sqrt{3} V_p$
 - $V_L = V_p / \sqrt{2}$
 - $V_L = 2/p V_p$
305. In case of a delta connected load, if one resistor is removed, the power will become
- zero.
 - one-third
 - two-third*
306. Three identical impedance are connected in delta to a 3-phase supply of 400 V. The line-current is 34.65 A and the total power taken is 14.4 kw. The resistance of the load in each phase (in ohm) is
- 20
 - 16
 - 12*
 - 10
307. The power in a 3-phase system is given by $\sqrt{3} V_L I_L \cos F$ where F is the phase angle between
- line voltage and line current.
 - phase voltage and phase current. *
 - line voltage and phase current.
 - phase voltage and line current.
308. Three equal impedance are first connected in delta across a 3-F balanced supply. If the same impedance are connected in star across the same supply
- phase currents will be one-third.
 - line currents will be one-third.
 - power consumed will be one-third.*
 - none of the above.
309. Which of the following is a four wire system ?
- Delta.
 - Star.*
 - Both delta and star.
 - Neither delta nor star.
310. A 3-phase 6.6/0.4 kv transformer is to supply a load at 230 V. Its secondary should be connected in
- star.*
 - delta.
 - open-delta.
 - series.
 - parallel.
311. A 3-phase star connected symmetrical load consumes P watts of power from a balanced supply. If the same

load is connected in delta to the same supply, the power consumption will be

- a. P
- b. $\sqrt{3} P$
- c. $3 P^*$
- d. not determined from the given data.

312. A set of 3 equal resistors, each of value R_x connected in star across R_{YB} in place of load as shown in the figure-2.21 consumes the same power as the unbalanced delta connected load. The value of R_x is
- a. 33.33 W
 - b. 100 W*
 - c. 173.2 W
 - d. 300 W

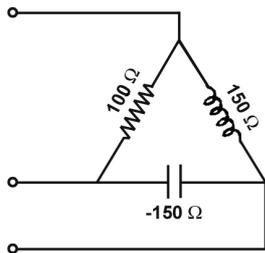


Fig-2.21

313. In the delta equivalent of the given star-connected circuit Z_{QR} is equal to (Ref.fig-2.22)
- a. 40 W
 - b. $(20 + j 10) W$
 - c. $(10 + j 10/3) W$
 - d. $(10 + j 30) W^*$

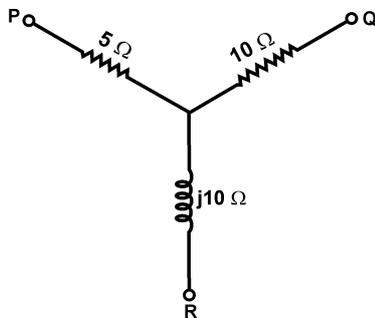


Fig-2.22

314. The power is measured in terms of decibels in case of
- a. transformers.
 - b. motors.
 - c. electronic equipment.*
 - d. none of the above.
315. The minimum number of wattmeters to measure power in a 3-phase unbalanced star-connected load is
- a. one.
 - b. two.*
 - c. three.
 - d. four.
316. The power measurement in balanced 3-f circuit can be done by
- a. one wattmeter method only.
 - b. two wattmeter method only.
 - c. three wattmeter method only.
 - d. any one of the above.*
317. The power delivered to a 3-phase load can be measured

by the use of 2 wattmeters only when the

- a. load in balanced.
 - b. load is unbalanced.
 - c. 3-phase load is connected to the source through 3-wires.*
 - d. 3-phase load is connected to the source through 4-wires.
318. In the measurement of 3-phase power by two-wattmeter method, if the two wattmeter readings are equal the power factor of the circuit is
- a. 0.8 lagging.
 - b. 0.8 leading.
 - c. zero.
 - d. unity.*
319. In a two wattmeter method of measuring power in 3-phase system one of the wattmeters reads negative implying
- a. wattmeter connected in faulty.
 - b. load is unbalanced.
 - c. power flow is in the reverse direction.
 - d. power factor is less than 0.5*
320. In two wattmeters method of power measurement, one of the wattmeters will shown negative reading when the load power factor angle is strictly
- a. less than 30°
 - b. less than 60°
 - c. greater than 30°
 - d. greater than 60° *
321. While measuring power in a three phase load by two-wattmeter method, the readings of the two wattmeters will be equal and opposite when
- a. pf is unity.
 - b. load is balanced.
 - c. phase angle is between 60° and 90°
 - d. the load is purely inductive.*
322. Which of the following statements is true about two-wattmeters method for power measurement in 3-phase circuit ?
- a. Power can be measured using two wattmeter method only for star-connected 3-phase circuits.
 - b. When two wattmeters show identical readings, the power factor is 0.5.
 - c. When power factor is unity, one of the wattmeter reads zero.
 - d. When the readings of the two wattmeters are equal but of opposite sign, the power factor is zero.*
323. Two-meters method is employed to measure power in a 3-phase balanced system with the current coils connected in the A and C lines. The phase sequence is ABC. If the wattmeter with its current coil in A-phase line reads zero, then the power factor fo the 3-phase load will be
- a. zero lagging.
 - b. zero leading.
 - c. 0.5 lagging*
 - d. 0.5 leading.
324. The ratio of the readings of two wattmeters connected to measure power in a balanced 3-phase load is 5:3 and the load is inductive. The power factor of the load is
- a. 0.917 lead.
 - b. 0.917 lag.*

- c. 0.6 lead. d. 0.6 lag.

325. A wattmeter is installed in a balanced 3-f system and is connected as shown in given circuit diagram (Fig-2.23). The wattmeter will measure _____ power.

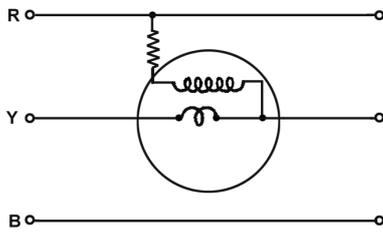


Fig-2.23

- a. true b. reactive*
c. apparent d. total
326. W_1 and W_2 are the readings of two wattmeters used to measure power of a 3-phase balanced load. The reactive power drawn by the load is
a. $W_1 + W_2$ b. $W_1 - W_2$
c. $\sqrt{3} (W_1 + W_2)$ d. $\sqrt{3} (W_1 - W_2)$.*
327. V_{RN} , V_{YN} and V_{BN} are the instantaneous line to neutral voltages and I_R , I_Y and I_B are instantaneous line currents in a balanced three phase circuit, the computation $V_{RN} (i_Y - i_B) - (V_{YN} - V_{BN})i_R$ will yield a quantity propotional to the
a. active power b. power factor
c. reactive power* d. complex power
328. Readings of 1,154 and 577 watts are obtained when two wattmeter method was used on a balanced load. The delta connected load impedance for a system of 100 V will be
a. $15 \angle \pm 30^\circ$ b. $15 \angle + 30^\circ$ *
c. $15 \angle - 30^\circ$ d. $15 \angle + 90^\circ$
329. In a 3-phase supply, floating neutral is undesirable because it may result in _____ across the load.
a. unequal line voltages* b. high voltage
c. low voltage.
330. Phase reversal in a 4-wire unbalanced load supplied from a balanced 3-phase supply causes change in
a. the power consumed.
b. magnitude of phase currents.
c. only the magnitude of the neutral current.
d. magnitude as well as phase angle of the neutral current.*
331. Lamps of 40 W, 100 W and 200 W rating are connected in different phases of a 3-phase, 4-wire supply. If the neutral wire breaks, then the lamp likely to fuse first will be
a. 200 W. b. 100 W.
c. 40 W.* d. all lamps.
332. Three unequal impedances are connected in star to a 3-phase system. The sum of three line currents will be
a. equal to the each line current.
b. zero.*
c. none of these.
333. Three unequal impedance are connected in delta to a 3-phase, 3-wire system.
a. The voltage across the three phases will be different.
b. Both of the phase currents and line currents will be unbalanced.*
c. Phase currents will be unbalanced but the line currents will be balanced.
d. None of the above.
334. Non-sinusoidal waveforms are made up of
a. different sinusoidal waveforms.*
b. fundamental and odd harmonics.
c. fundamental and even harmonics.
d. even and odd harmonics only.
335. In a 3-phase system _____ the harmonics have negative phase sequence.
a. 5 b. 11
c. 17 d. all of these*
336. If a capacitor is energised by a symmetrical square wave current, then the steady-state voltage across the capacitor will
a. square wave. b. triangular wave.*
c. step function. d. impulse function.
337. A coil is tuned to a certain frequency by a 220 mmF capacitor. A capacitor of 20 mmF is required to tune the same coil to the third harmonic of this frequency. The self capacitance of this coil is
a. 10 mmF b. 2.5 mmF
c. 5 mmF* d. 20 mmF
338. A voltage wave containing 25% third harmonic is applied to a capacitor. The percentage of third harmonic in the current wave will be
a. much less than 25%.
b. much more than 25%.*
c. 25%.
d. zero.
339. A voltage wave containing 20% third harmonic is applied to an inductor. The percentage of third harmonic in the current wave will be
a. much less than 20%.* b. much more than 20%.
c. 20% d. 10%

340. An ac circuit has an impedance of $(10 + j12) \Omega$ for the fundamental frequency. For the 3rd harmonic the impedance will be
- $(30 + j12) \Omega$
 - $(30 + j4) \Omega$
 - $(10 + j36) \Omega$ *
 - $(10 + j4) \Omega$

341. A inductive circuit has a pf of 0.75 for the fundamental frequency. if the applied voltage contains 25% third harmonic, the overall pf will be
- 0.75*
 - less than 0.75
 - more than 0.75
 - 0.6

342. A capacitance circuit has a pf of 0.8 for the fundamental frequency. If the applied voltage contains 20% third harmonic, the overall pf will be
- 0.8
 - less than 0.8*
 - more than 0.8
 - 1.0

343. A pure resistance of 10Ω has an applied voltage $V(t)$ given as

$$V(t) = 230 \left[1 - \frac{(\omega t)^2}{2} + \frac{(\omega t)^4}{4} - \frac{(\omega t)^6}{6} \dots \right] \text{volts}$$

The instantaneous current in the resistor is given by

- $23 \cos \omega t$.
 - $23 \sin \omega t$.
 - $230 \sin \omega t$ *
 - $230 \cos \omega t$
344. In the above question, the power dissipated is given as
- $2,645 \cos^2 \omega t$ *
 - $5,290 \cos^2 \omega t$.
 - $5,290 \sin^2 \omega t$.
 - $529 \cos^2 \omega t$.

345. The rms value of the periodic waveform $e(t)$, shown in fig 2.24 is

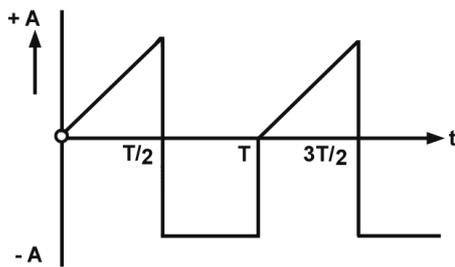


Fig:-2.24

- $\sqrt{3/2} A$
 - $\sqrt{2/3} A$ *
 - $\sqrt{3} A$
 - $\sqrt{2} A$
346. A periodic rectangular signal, $x(t)$ has the waveform shown in the figure-2.25. Emergency of the fifth harmonic of its spectrum is

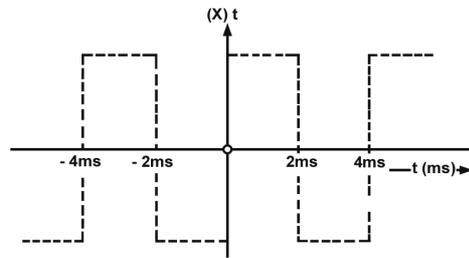


Fig-2.25

- 40Hz
 - 200Hz*
 - 250Hz
 - 1,250Hz
347. Any waveform can be expressed in Fourier series if
- sampling conditions are satisfied.
 - dirchiet conditions are satisfied.
 - maxwell's conditions are satisfied.
 - none of the above conditions is required to be satisfied.*

348. The Fourier series is expressed by

a. $f(t) = a_0 + \sum_{n=1}^{\infty} (a_n \cos n\omega t + b_n \sin n\omega t)$

b. $f(t) = a_0 + \sum_{n=1}^{\infty} (a_n \cos n\omega t + b_n \sin \omega t)$ *

c. $f(t) = a_0 + \sum_{n=1}^{\infty} (\cos n\omega t + \sin \omega t)$

d. $f(t) = a_0 + \sum_{n=1}^{\infty} (a_n \cos n\omega t + b_n \sin \omega t)$

349. C_n coefficient while expressing waveform in exponential Fourier series is given by

a. $\frac{2}{T} \int_0^T f(t) e^{-jn\omega t} d(\omega t)$ *

b. $\frac{2}{T} \int_{-T/2}^{T/2} f(t) e^{-jn\omega t} d(\omega t)$

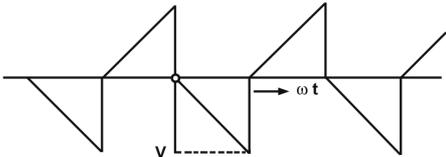
c. $\frac{1}{2\pi} \int_0^{2\pi} f(t) e^{-jn\omega t} d(\omega t)$

d. $\frac{1}{2\pi} \int_{-\pi}^{\pi} f(t) e^{-jn\omega t} d(\omega t)$

350. The complex wave is symmetrical when,

- it contains only even harmonics.
- it contains only odd harmonics.
- it contains both odd and even harmonics.*
- phase difference between even harmonics and fundamental is either $\pi/2$ or $3\pi/2$.

351. Two complex waves will have the same waveform if
- they contain the same harmonics.
 - harmonics are similarly spaced with respect to the fundamental.*

- c. the ratio of corresponding harmonics to their respective fundamentals is the same.
d. all of the above.
352. The trigonometric Fourier series for a complex wave will contain positive cosine terms only when
a. it contains even harmonics.
b. its two half cycles are symmetrical.
c. its value is zero at $\theta = \pi, 2\pi$ etc.
d. its value is zero at $\theta = \pi/2, 3\pi/2$ etc.*
353. A function $f(\theta)$ satisfies the relation $f(-\theta) = -f(\theta)$ when this function contains
a. only cosine terms.
b. only sine terms.
c. both sine and cosine terms.
d. none of the above.*
354. For the expansion of $f(\omega t)$ in Fourier series $a_0 + a_1 \cos \omega t + \dots + a_n \cos n\omega t + \dots + b_1 \sin \omega t + \dots + b_n \sin n\omega t$ if $f(\omega t) = f(-\omega t)$ then
a. $a_n = 0$.
b. $b_n = 0$ for all n . *
c. $a_0 = 0$.
d. $a_n = 0$ for all n except $n = 0$.
355. The Fourier series expansion of an odd periodic function contains
a. cosine terms.
b. constant terms only. *
c. sine terms.
356. Which of the following conditions is true for even function
a. $f(t) = -f(n \pm T/2)$. b. $f(t) = -f(t)$.
c. $fc(t) = f(-t)$. * d. $f(t) = f(T)$.
357. The waveform shown in the figure 2.26 below contains

a. only odd cos terms.
b. only even sine terms.
c. both sine and cos odd terms.*
d. both sine and cos even terms.
358. An even waveform when expressed in exponential Fourier series will contain
a. only imaginary coefficient.
b. only real coefficient.
c. both of (a) and (b). *
d. none of these.
359. An exponential Fourier series coefficient is $j10/2\pi n$, trigonometric series cosine term coefficient will be
a. $10/\pi n$. b. $10j/\pi n$ *
- c. zero d. indeterminate.
360. Even higher harmonics will be of significant value in
a. discontinuous waveform.
b. continuous waveform.
c. both *
d. neither.
361. Spectrum analyzer is used across the frequency spectrum, of a given signal to study the
a. current distribution.*
b. voltage distribution.
c. energy distribution.
d. power distribution.
362. An inductor at $t = 0^+$ with initial current I_0 acts as
a. voltage source. b. current source.*
c. open-circuit. d. short-circuit.
363. A capacitor with initial charge Q_0 at $t = 0^+$ acts as
a. open-circuit. b. short-circuit.*
c. voltage source. d. current source.
364. Which of the following will act as short-circuit at $t = 0^+$ with zero initial conditions ?
a. Capacitor. b. Inductor.
c. Resistor.* d. None of these.
365. A capacitor with zero initial conditions at $t = 0^+$ acts as
a. open-circuit.*
b. short-circuit.
c. current source.
d. voltage source.
366. An inductor at $t = \infty$ with zero initial conditions acts as
a. current source.
b. voltage source.*
c. short-circuit.
d. open-circuit.
367. An inductor at $t = 0^+$ with zero initial conditions acts as
a. open-circuit.
b. short-circuit.
c. current source.*
d. voltage source.
368. A capacitor with no initial charge at $t = \infty$ acts as
a. short-circuit.* b. open-circuit.
c. voltage source. d. current source.
369. Which of the following will act as open-circuit at $t = 0^+$ with zero initial conditions ?
a. Resistor. b. Capacitor.*
c. Inductor. d. None of these.
370. In inductor with initial conditions I_0 has the equivalent circuit at $t = \infty$, (Ref.fig-2.27)

381. In transient circuit analysis, complementary function gives _____ response.
 a. transient * b. steady state
 c. both d. neither
382. In transient circuit analysis the particular solution gives _____ response.
 a. transient* b. steady state
 c. neither d. both
383. Inductance affects the flow of direct current at the time of
 a. turning off. b. turning on.*
 c. turning on and off d. none of the above.
384. The current through an inductor follows
 a. a linear growth.
 b. a linear decay.
 c. an exponential growth.*
 d. an exponential decay.
385. When an R-L circuit is switched on across a dc source of supply of V volts, the expression for current is given as
 a. $i(t) = \frac{V}{R}(1 - e^{-\frac{R}{L}t})$
 b. $i(t) = \frac{V}{R}(1 + e^{-\frac{R}{L}t})$
 c. $i(t) = \frac{V}{R}(1 + e^{\frac{R}{L}t})$ *
 d. $i(t) = \frac{V}{R}(1 - e^{\frac{R}{L}t})$
386. In the above expression for current, the steady state component is
 a. $-e^{-\frac{Rt}{L}} \frac{V}{R}$ * b. $\frac{V}{R}$
 c. $\frac{V}{R} - e^{-\frac{Rt}{L}}$ c. none of these.
387. In the above expression for current, the currents at $t = 0$ and $t = \infty$ will be _____ respectively.
 a. $\frac{V}{R}$ and 0 b. $\frac{V}{R}$ and $\frac{V}{R}$ *
 c. 0 and $\frac{V}{R}$ d. none of these
388. In an R-L series circuit excited by a dc voltage V, the initial rate of rise of current is
 a. $\frac{V}{L}$ A/s b. $\frac{V}{R}$ A/s
 c. $\frac{V}{RL}$ A/s * d. $\frac{V.R}{L}$ A/s
389. In an R-L series circuit excited by a dc source the final value of the current is independent of
 a. resistance R* b. inductance L
 c. source voltage d. none of the above
390. The current in an R-L circuit at the instant at connecting it (suddenly) to a dc source of V volts will be
 a. V/R b. V/L*
 c. zero d. V/LR
391. In a discharging of R-L circuit, the voltage across the resistor exhibits _____ decay.
 a. linear b. exponential
 c. constant* d. no
392. In an R-L circuit connected to an alternating sinusoidal voltage, the magnitude of transient current primarily depends on the
 a. instant in the voltage cycle at which circuit is closed.
 b. impedance of the circuit.*
 c. frequency of the voltage.
 d. peak value of steady state current.
393. In the circuit given in Fig-2.31, the initial current $I_0 = 25$ A. The current response is given as
 a. $12.5 e^{-3t}$ A b. $25 e^{-3t}$ A
 c. $25 e^{3t}$ A d. $25 e^{-t/3}$ A

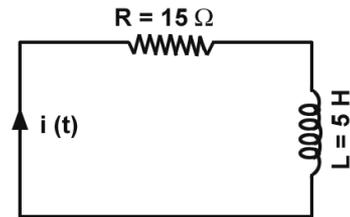


Fig-2.31

394. An R-L circuit is fed from an ac source of voltage $V_{\max}(\sin \omega t + \alpha)$. The transient component of the current, when the circuit is switched on, will be zero if
 a. $\alpha = 0$
 b. $\alpha = 90^\circ$ *
 c. $\alpha = \tan^{-1} \frac{\omega L}{R}$
 d. $\alpha = 135^\circ$
395. In an R-L circuit having impedance angle ϕ is switched on when the applied sinusoidal voltage wave is passing through an angle θ , there will be no switching transient if
 a. $\theta - \phi = 0$ b. $\theta + \phi = 0$
 c. $\theta - \phi = 90^\circ$ * d. $\theta + \phi = 90^\circ$
396. The transient response of the initially released network shown in fig-2.32 is

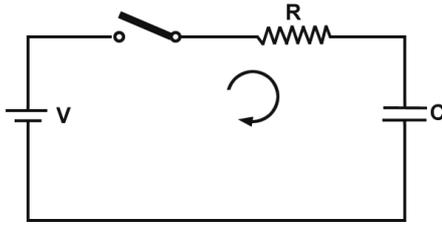


Fig-2.32

- a. $i = \frac{V}{R} e^{-t/CR}$ * b. $i = \frac{V}{R} e^{t/RC}$
 c. $i = \frac{V}{R} (1 - e^{-t/RC})$ d. $i = \frac{V}{R} (1 + e^{-t/RC})$

397. In an R-C series circuit excited by a dc voltage of V volts, the initial current is

- a. 0 * b. $\frac{V}{R}$
 c. $\frac{V}{C}$ d. $\frac{V}{R} \cdot C$

398. In an R-C series circuit excited by a dc source, the circuit current is maximum at

- a. $t = 0^-$ b. $t = 0^+$
 c. $t = \infty$ d. $t = CR$

399. A series R-C circuit is suddenly connected to dc voltage of V volts. The current in the series circuit, just after the switch is closed, is equal to

- a. zero b. V/RC *
 c. VC/R d. V/R

400. An R-C series circuit is excited by a dc source. After its switching on

- a. the voltages across resistance R and capacitance are equal.
 b. the voltage across resistance is zero.
 c. the voltage across capacitance is zero.
 d. the sum of the voltage across R and C is always equal to the supply voltage.*

401. A capacitor is charged through a resistance R, the time constant of the circuit is

- a. R/C . b. $1/RC$
 c. RC * d. R/C

402. The time constant of an R-C circuit is defined as the time take by the voltage across the capacitor to become _____ if its final value.

- a. 63.2 %* b. 36.8 %
 c. 50 % d. 100 %

403. In the network shown in the figure -2.33 below $C = 5 \mu F$ and $R = 2 M \Omega$.

- The potential at P, at the instant of closing the switch S and 10 seconds after closing S will respectively be
 a. 0 V and 63.2 V.* b. 100 V and 63.2 V.
 c. 0 V and 36.8 V. d. 100 V and 36.8 V.

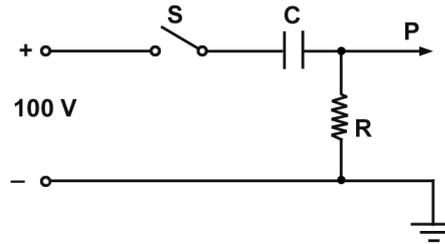


Fig-2.33

404. In the circuit shown in the figure-2.34, the switch S is closed at $t = 0$. The value of current at $t = 0^+$ will be

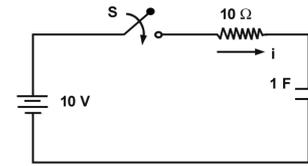


Fig-2.34

- a. zero. b. -1A.
 c. +1A. d. indeterminate.*

405. In the network shown in fig-2.35, the capacitor C_1 is initially charged to a voltage V_0 before the switch S is closed. In the steady state

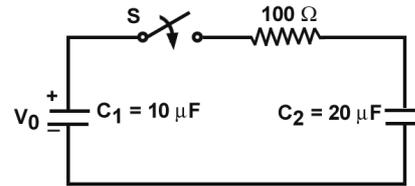


Fig-2.35

- a. C_1 and C_2 are charged to equal coulombs.
 b. C_1 and C_2 are charged to equal voltage.
 c. C_1 and C_2 are discharged fully.*
 d. C_2 alone is charged to voltage V_0 .

406. The steady-state current in the R-C series circuit, on the application of step voltage of magnitude E will be

- a. zero b. E/R *
 c. $\frac{E}{R} e^{-\frac{1}{CR}}$ d. $\frac{E}{RC} e^{-1}$

407. A series L-C circuit is suddenly connected to a dc voltage source of V volts. The current in the series circuit, just after the switch is closed is equal to

- a. V/L * b. V/C
 c. zero d. V/LC

408. The transient current in loss free L-C circuit, when excited from an ac source is _____ sine wave.

- a. an under damped b. an undamped
 c. an over damped* d. critically damped

409. In a loss free R-L-C circuit the transient current will be

- a. square wave.
- b. oscillating.*
- c. sinusoidal.
- d. non-oscillating.
- e. non-sinusoidal.

410. In an R-L circuit connected to an alternating sinusoidal voltage, the magnitude of transient current primary depends on the
- a. instant in the voltage cycle at which circuit is closed.
 - b. impedance of the circuit.
 - c. frequency of the voltage.*
 - d. peak value of steady state current.

411. In the circuit given in Fig-2.36, the switch is closed at $t = 0$. The capacitor initially has value of $V_{AB}(0^-) = -30$ V. The current response will be

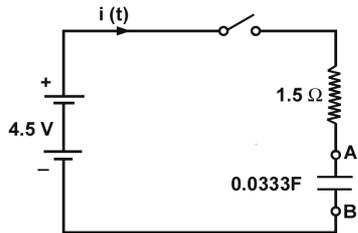


Fig-2.36

- a. $3 e^{-2t}$ *
- b. $5 e^{-2t}$
- c. $1 e^{-2t}$
- d. $5 e^{0.5t}$ A.

412. An R-C circuit ($R = 20 \Omega$ and $C = 1$ F) is connected across an ac supply of voltage $V = 100 \cos(t/20)$. The switch is closed at $t = 0$ and the initial charge on the capacitor is zero. The steady state current response for the given input will be
- a. $10 \cos(t/20)$
 - b. $7.07 \cos t/10$ *
 - c. $10 \cos(t/20+45^\circ)$
 - d. $7.07 \cos(t/10+45^\circ)$

413. The double energy transient occur in the ____ circuit.
- a. R-L.
 - b. R-C.
 - c. L-C.
 - d. R-L-C.*

414. Transient current in an R-L-C circuit is oscillatory when

- a. $R = 0$
- b. $R > 2 \sqrt{\frac{L}{C}}$
- c. $R < 2 \sqrt{\frac{L}{C}}$
- d. $R = 2 \sqrt{\frac{L}{C}}$ *

415. The exact natural frequency of free oscillations in an oscillatory circuit with a capacitance of 0.05μ F, inductance 2μ H and resistance 1.25Ω will be
- a. 503 kHz.
 - b. 252 kHz.
 - c. 356 kHz.*
 - d. 160 kHz.

416. In the network shown in the figure-2.37, there is no initial current through L_2 and no initial voltage across the C. The switch 'S' is closed at $t = 0$. The current i_{L_1} in the

inductor L_1 and the voltage V_C across C at $t = 0^+$ and $t = \infty$ will be

$i_{L_1}(0^+)$	$i_{L_1}(\infty)$	$v_C(0^+)$	$v_C(\infty)$
a. 1/3 A	1/3A	2/3 V	2/3V
b. 0	1/3A	0	1V
c. 1/3A	0	2/3V	0
d. 0	1/3A	0	2/3V*

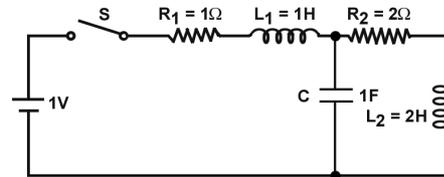


Fig-2.37

417. In the given circuit (Fig-2.38), the value of R that will give critical damping is

- a. 1Ω
- b. 2Ω
- c. 4Ω
- d. 10Ω *

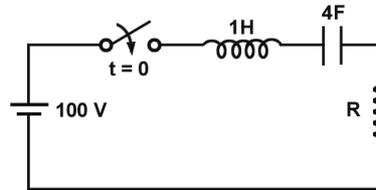


Fig-2.38

418. Unbalanced system of 3 phasors can be resolved into three balanced component system of phasor called _____ component system.

- a. unsymmetrical.*
- b. non-symmetrical.
- c. symmetrical.
- d. none of these.

419. The symmetrical component method is very useful in

- a. determination of currents resulting from unbalanced faults.
- b. solution of unbalanced polyphase circuits.
- c. analysis of performance of 3-phase electrical machinery.*
- d. all of the above.

420. The operator 'a' turns a phasor through

- a. 60°
- b. 120°
- c. 180°
- d. -60° *

421. An unbalanced 3-phase voltage system having RYB sequence actually consist of _____ sequence component(s).

- a. positive.
- b. negative.*
- c. zero.
- d. all of these.

422. In the case of an unbalanced star connected load supplied from an unbalanced 3-phase, 3-wire system, load currents will consist of _____ sequence components.

- a. positive.
- b. negative.
- c. zero.
- d. both (a) and (b).*

423. The zero-sequence component of the unbalanced 3-phase system of phasors V_A , V_B and V_C is one ____ of their phasor sum.
 a. fourth b. third
 c. half d. sixth*
424. Zero sequence currents always flow through
 a. earth wire. b. phase wires.*
 c. neutral wire. d. any of these.
425. Zero sequence currents may be found circulating in a transformer when the winding is connected in
 a. delta b. star
 c. either (a) or (b).* d. neither (a) nor (b).
426. In delta connected loads the zero sequence currents
 a. are absent.*
 b. circulate locally.
 c. flow through phase wires.
 d. flow through earth wire.
427. In 3-phase, 3-wire star connected system, the zero sequence currents
 a. flow through phase wires.*
 b. are absorbed in phase wires.
 c. are absent.
 d. none of the above.
428. Which of the following statements associated with zero sequence components of current and voltage are true ?
 a. Any circuit which allows the flow of positive sequence currents will also allow the flow of negative sequence currents.
 b. In a 3-phase, 4-wire system, the neutral wire carries only the zero sequence currents.
 c. The zero sequence components of line to line voltages are non-existent regardless of degree of imbalance in these voltages.*
 d. all of the above.
429. The circuit shown in the fig-2.39 is a
 a. low-pass filter. b. high-pass filter.
 c. band-pass filter. d. differentiator.*

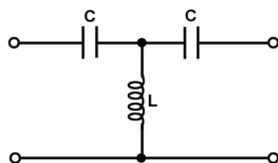


Fig-2.39

430. The series element of a band stop filter is
 a. inductive.
 b. capacitive.*
 c. parallel combination of L and C.
 d. series combination of L and C.
431. The shunt element of a band stop filter is
 a. inductive
 b. capacitive

- c. parallel combination of L and C.*
 d. series combination of L and C.
432. The series element of a bandpass filter is
 a. inductive.
 b. capacitance.
 c. parallel combination of L and C.
 d. series combination of L and C.*
433. The shunt element of a bandpass filter is
 a. inductive.
 b. capacitive.
 c. parallel combination of L and C.
 d. series combination of L and C.*
434. The condition for a network with Z_s series impedance and Z_p shunt impedance to have a passband is
 a. $0 > \frac{Z_s}{4Z_p} > -1$ b. $1 > \frac{Z_s}{4Z_p} > 0$
 c. $0 > \frac{Z_s}{4Z_p} > 1$ * d. $0 > \frac{Z_s}{4Z_p} > -1$
435. The Laplace transform of t^n is
 a. $\frac{n!}{s^{n+1}}$ * b. $\frac{1}{s^{2n}}$
 c. $\frac{n}{s-a}$ d. $\frac{n^2}{s+a}$
436. The Laplace transform of $t^n e^{-at}$ is
 a. $\frac{n!}{s^{n+1}}$ * b. $\frac{n!}{(s+a)^{n+1}}$
 c. $\frac{n!}{s^{n+1}}$ d. $\frac{n!}{(s-a)^{n-1}}$
437. The Laplace transform of $t \sin \omega t$ is
 a. $2 \omega s / (s^2 + \omega^2)^2$ b. $s^2 - \omega^2 / (s^2 - \omega^2)^2$ *
 c. $2 \omega s / (s^2 - \omega^2)^2$ d. $s^2 + \omega^2 / (s^2 - \omega^2)^2$
438. The Laplace transform of $\cos(\omega_0 t + \phi)$ is
 a. $\frac{s^2 + \omega^2}{s \sin \phi + \omega_0 \cos \phi}$ *
 b. $\frac{s^2 + \omega^2}{s \cos \phi - \omega_0 \sin \phi}$
 c. $\frac{s \cos \phi + \omega_0 \sin \phi}{s^2 + \omega^2}$
 d. $\frac{s \cos \phi - \omega_0 \sin \phi}{s^2 - \omega_0^2}$
439. For which of the following function the Laplace transform will be $2/s^3$?
 a. $f(t) = t$ b. $f(t) = 2t$ *
 c. $f(t) = t^2$

440. Laplace transform of $\frac{e^{-at} - e^{-bt}}{b - a}$ is

- a. $\frac{1}{(s + a)(s - a)}$
- b. $\frac{1}{(s - a)(s + b)}$
- c. $\frac{1}{(s - a)(s - b)}$ *
- d. $\frac{1}{(s + a)(s + b)}$

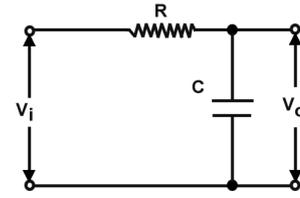


Fig-2.40

441. With symbols having the usual meanings, the Laplace transform of $u(t - a)$ is

- a. $\frac{1}{s}$
- b. $\frac{1}{s - a}$
- c. $e^{-as} \left(\frac{1}{s}\right)$
- d. $e^{as} \left(\frac{1}{s}\right)$ *

450. Fig-2.41 represents

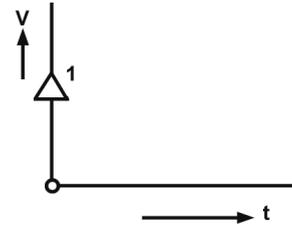


Fig-2.41

442. Which of the following functions represents parabolic characteristics ?

- a. $f(t) = t$
- b. $f(t) = t^2$
- c. $f(t) = e^{-at}$ *

450. Fig-2.41 represents

- a. unit ramp function. *
- b. unit impulse function.
- c. unit step function.
- d. unit doublet value.

443. The Laplace transform of unit impulse function is

- a. $1/s$
- b. s *
- c. 1
- d. $1/s^2$

444. The Laplace transform of a unit step function is

- a. $1/s$
- b. 1
- c. s *
- d. $1/s^2$

451. The Laplace transform of $v(t)$ shown in the figure-2.42 is

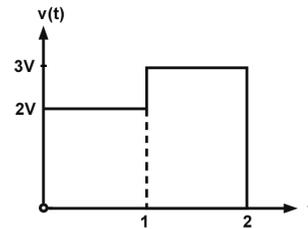


Fig-2.42

445. A unit ramp function when integrated gives unit _____ function.

- a. ramp *
- b. parabolic
- c. impulse
- d. step

446. The Laplace transform of a unit ramp function is

- a. 1
- b. s *
- c. $1/s$
- d. $1/s^2$

447. The Laplace transform of a unit parabolic function is

- a. $2/s^3$
- b. $1/s^2$
- c. $1/s$
- d. s^2 *

a. $\frac{V}{s} e^{-s} - \frac{3V}{s} e^{-2s}$

b. $\frac{2V}{s} + \frac{3V}{s} e^{-2s}$ *

c. $\frac{2V}{s} + \frac{V}{s} e^{-s}$

d. $\frac{2V}{s} + \frac{V}{s} e^{-s} - \frac{3V}{s} e^{-2s}$

448. Laplace transform of a delayed unit impulse function $\delta(t - 1)$ is

- a. unity *
- b. zero
- c. e^{-s}
- d. s

449. If $v_i = \delta(t)$, v_o will be (Ref. fig-2.40)

- a. $\frac{1}{RC} e^{-t/RC}$
- b. $\delta(t)$
- c. 0 *
- d. $\frac{R}{C} e^{-tC/R}$

452. A unit impulse input to linear network has a response $R(t)$ and a unit step input to the same network has response $S(t)$. The response $R(t)$

a. equals $\frac{ds}{dt}(t)$

b. equals the integral of $s(t)$

c. is the reciprocal of $s(t)$

d. has no relation with $s(t)$ *

453. Non-linear system cannot be analysed by Laplace transform because

- a. it has no zero initial conditions.*
- b. superposition law cannot be applied.
- c. non-linearity is generally not well defined.
- d. all of the above.

454. Which of the following conditions are necessary for the validity of initial value theorem

$$\lim_{s \rightarrow \infty} sF(s) = \lim_{t \rightarrow 0} f(t)$$

- a. $f(t)$ and its derivative $f'(t)$ must have Laplace transform.*
- b. If the Laplace transform of $f(t)$ is $F(s)$, the $\lim_{s \rightarrow \infty} sF(s)$ must exist.
- c. Only $f(t)$ must have Laplace transform.
- d. both (a) and (b).

455. According to final value theorem

- a. $f(t) = \lim_{t \rightarrow \infty} sF(s)$.
- b. $f(t) = \lim_{t \rightarrow \infty} F(s)$.
- c. $f(t) = \lim_{t \rightarrow \infty} sF(s)$.
- d. none of the above.*

456. Given $F(s) = \frac{(s+2)}{s(s+1)}$, the initial and final values of $f(t)$

will be respectively

- a. 1, 2*
- b. 2, 1
- c. 1, 1
- d. 2, 2

457. If $F(s) = \frac{1(s+1)}{s(s+k)}$ and $f(t) = 1/2$, then the value of k

is $t \rightarrow \infty$

- a. 1/2 b.*
- b. 1
- c. 2
- d. ∞

458. The Laplace transform of $f(t)$ is $F(s)$. Given

$$F(s) = \frac{\omega}{s^2 + \omega^2}$$

- a. ∞
- b. zero.
- c. one*
- d. none of the above.

459. Inverse Laplace transform of $\frac{1}{s-a}$ is

- a. $\sin at$
- b. $\cos at$ *
- c. e^{at}
- d. e^{-at}

460. is $\mathfrak{I}^{-1} \frac{s-1}{s^2+3s+2}$

- a. $3e^{-2t} + 2e^{-t}$
- b. $3e^{-2t} - 2e^{-t}$
- c. $2e^{-3t} - e^{-2t}$ *
- d. $2e^{-3t} + e^{-2t}$

461. $\mathfrak{I}^{-1} \frac{6}{(s+a)^4}$ is

- a. $t^2 e^{-at}$
- b. $t^3 e^{-at}$ *
- c. $t^4 e^{-at}$
- d. none of these.

462. $\mathfrak{I}^{-1} \frac{1}{s^2 7s+12}$ is

- a. $e^{-2t} - e^{-3t}$
- b. $e^{-3t} - e^{-4t} / 2$ *
- c. $e^{-3t} - e^{-4t}$
- d. $e^{-3t} - e^{-2t} / 2$

463. The response of an initially released linear circuit to a signal V_s is $e^{-2t} u(t)$. If the signal is changed to

$$\left(V_s + 2 \frac{dV_s}{dt} \right)$$

- a. $-4 e^{-2t} u(t)$
- b. $-3 e^{-2t} u(t)$
- c. $4 e^{-2t} u(t)$ *
- d. $5 e^{-2t} u(t)$

464. The open-circuit voltage ratio $\frac{V_2(s)}{V_1(s)}$ of the network shown in figure-2.43 is

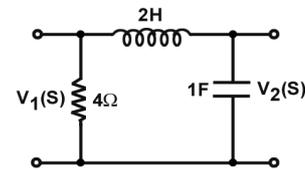


Fig-2.43

- a. $1 + 2s^2$
- b. $1/1 + 2s^2$
- c. $1 + 2s^*$
- d. $1/1 + 2s$

465. For the circuit given in the fig-2.44 $V_0 = 2V$ and the inductor is initially released. The switch S is closed at $t = 0$. The value of v at $t = 0^+$ is

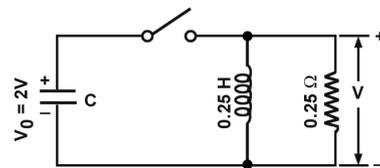


Fig-2.44

- a. 3V
- b. 2V
- c. 0.5V*
- d. 0.25V

466. $F(s) = \frac{(s+1)(s+3)}{s(s+2)}$ represents an

- a. RC impedance.
- b. RC admittance.*
- c. RC impedance and an RL admittance.
- d. RL admittance.

467. Consider the following statements

1. Transfer impedance is the reciprocal of transfer admittance.
2. One can derive transfer impedance of a network if its driving point impedance and admittance are known.
3. Driving point impedance is the ratio of the Laplace

transform of voltage and current time functions at the input.

Of these statements

- a. 1, 2 and 3 are correct.
- b. 1 and 2 are correct.
- c. 2 and 3 are correct.*
- d. 3 alone is correct.

468. The realization of the reactance function $Z(s)$

$$= \frac{4(s^2 + 1)(s^2 + 9)}{s(s^2 + 4)}$$

requires a minimum of

- a. 4 inductor and 4 capacitance.
- b. 3 inductance and 1 capacitor.
- c. 1 inductor, 1 capacitor, and 1 resistor.
- d. 2 inductors and 2 capacitors.*

469. The Fourier transform of a unit step function is given as

- a. $F(j\omega) = 1/j\omega$
- b. $F(j\omega) = j\omega$
- c. $F(j\omega) = j\omega$
- d. $F(j\omega) = \omega/j^*$

470. Fourier transform $\delta(t)$ is given as

- a. zero*
- b. 1
- c. $2\pi\delta(\omega)$
- d. $\pi\delta(\omega)$

471. The Fourier transform of a function $f(t)$ is given as

- a. $\int_{-\infty}^{+\infty} f(t)e^{-j\omega t} dt$
- b. $\int_0^{+\infty} f(t)e^{-j\omega t} dt *$
- c. $\int_0^{+\infty} f(t)e^{-\omega t} dt$
- d. none of these.

472. For the function shown in figure-2.45 Fourier transform is

- a. $2/j\omega^*$
- b. $j\omega/2$
- c. $2\pi\delta(\omega)$
- d. $\pi\delta(\omega) + 2/j\omega$

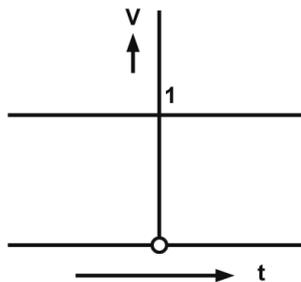


Fig-2.45

MATCHING TYPE QUESTIONS

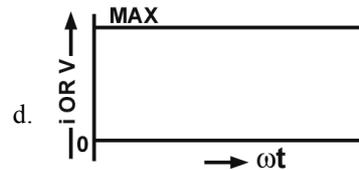
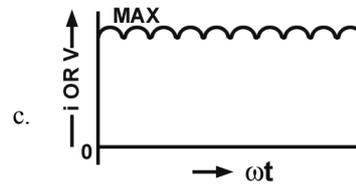
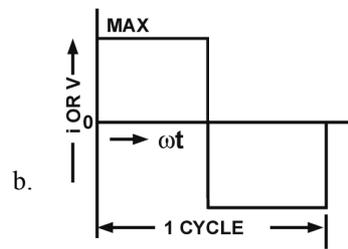
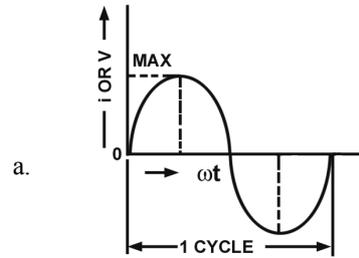
473. List 1

(Name of waveforms)

- A Dc
- B Pulsating
- C Rectangular
- D Sinusoidal

List 2

(Waveforms)



codes :

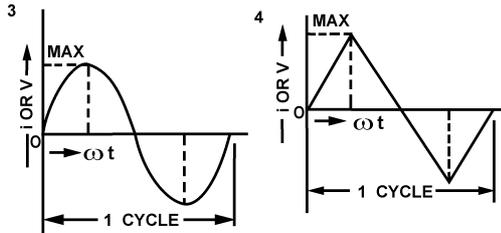
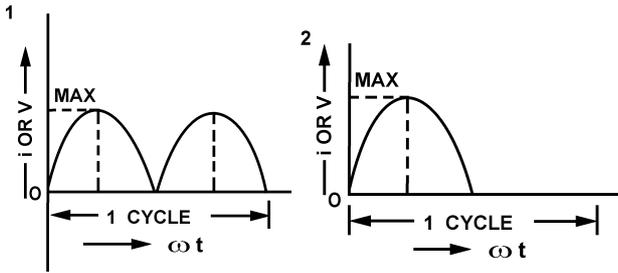
	A	B	C	D
a.	4	3	2	1*
b.	1	2	3	4
c.	2	3	1	4
d.	3	4	1	2

474. List 1

(Name of Wave form)

- A Sinusoidal
- B Full-wave rectified sinusoidal
- C Half-wave rectified sinusoidal
- D Triangular

List 2
(Waveform)



Codes : A B C D
 a. 1 2 3 4
 b. 3 1 2 4*
 c. 2 3 1 4
 d. 4 1 2 3

475. List 1
(Waveforms)
 A DC
 B Rectangular
 C Triangular
 D Sinusoidal
 E Full-wave rectified sinusoidal
 F Half-Wave rectified sinusoidal

List 2
(Average values)
 1. $0.636 I_{max}$
 2. $0.318 I_{max}$
 3. $1.01 I_{max}$
 4. $0.51 I_{max}$
 5. $0.707 I_{max}$
 6. $.578 I_{max}$

Codes : A B C D E F
 a. 3 5 6 4 2 1
 b. 5 3 4 2 6 1
 c. 5 3 4 1 1 2*
 d. 4 2 3 5 1 6

476. List 1
(Waveforms)
 A DC
 B Rectangular
 C Triangular
 D Sinusoidal
 E Full-Wave rectified sinusoidal
 F Half-wave rectified sinusoidal

List 2
(RMS values)
 1. $.707 I_{max}$
 2. $0.51 I_{max}$
 3. $1.01 I_{max}$
 4. $0.578 I_{max}$
 5. $0.636 I_{max}$
 6. $0.636 I_{max}$

Codes : A B C D E F
 a. 3 5 6 4 2 1
 b. 5 3 4 2 1 6
 c. 4 2 3 5 6 1
 d. 3 3 4 1 1 2*

477. List 1
(Waveforms)
 A DC
 B Rectangular
 C Triangular
 D Sinusoidal
 E Full-wave rectified sinusoidal
 F Half-wave rectified sinusoidal

List 2
(Peak factor)
 1. 1.414
 2. 2.0
 3. 2.0
 4. 1.732
 5. 1.57
 6. 1.16

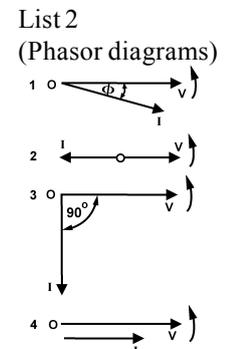
Codes : A B C D E F
 a. 3 3 4 1 1 2*
 b. 4 5 3 2 6 1
 c. 5 6 2 1 3 4
 d. 6 1 5 3 4 2

478. List 1
(Waveforms)
 A DC
 B Rectangular
 C Triangular
 D Sinusoidal
 E Full-wave rectified sinusoidal
 F Half-wave rectified sinusoidal

List 2
(Form factor)
 1. 1.16
 2. 1.0
 3. 1.11
 4. 1.57
 5. 1.414
 6. 2.0

Codes : A B C D E F
 a. 1 2 3 4 5 6
 b. 2 2 1 3 3 4*
 c. 2 3 4 5 6 1
 a. 4 5 6 1 2 3

479. List 1
(Statements)
 A Voltage and current in phasor
 B Voltage and current out of phase
 C Voltage and current in quadrature
 D Voltage and current in phase opposition



Codes : A B C D
 a. 1 2 3 4
 b. 2 4 1 3
 c. 4 1 3 2*
 d. 3 2 4 1

480. List 1
(Nature of circuit)
 A DC
 B Purely resistive
 C Purely inductive
 D Purely capacitive
 E Inductive
 F Capacitive

List 2
(Power factor)
 1. zero
 2. Unity
 3. Leading
 4. Lagging

Codes :	A	B	C	D	E	F
a.	2	2	1	1	4	3 *
b.	1	2	1	2	4	3
c.	2	2	1	1	3	4
d.	1	1	2	2	3	4

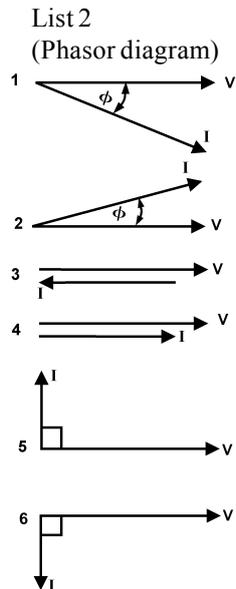
Codes :	A	B	C	D
a.	3	4	2	1
b.	1	2	3	4
c.	2	3	4	1
d.	4	3	2	1*

481. List 1
(Nature of circuit)
- A Purely resistive
 - B Purely inductive
 - C Purely capacitive
 - D Inductive
 - E Capacitive

- List 2
(Phase relation between V and I)
1. I will lag behind V
 2. I will lead V
 3. V and I in phase
 4. I lags behind V by 90°
 5. V lags behind I by 90°

Codes:	A	B	C	D	E
a.	3	4	5	2	1
b.	3	4	5	1	2*
c.	3	5	4	2	1
d.	3	5	4	1	2

482. List 1
(Natural of circuit)
- A Purely resistive
 - B Purely inductive
 - C Purely capacitive
 - D Inductive
 - E Capacitive



Codes :	A	B	C	D	E
a.	4	5	6	1	3
b.	3	6	5	2	1
c.	4	6	5	1	2 *
d.	3	5	6	2	1

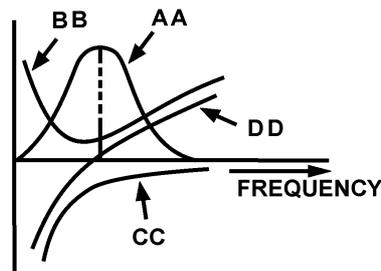
483. List 1
(Nature of circuit)
- A Purely resistive
 - B Purely inductive
 - C Purely capacitive
 - D Inductive
 - E capacitive

- List 2
(Expression for I taking voltages as $V_{max} \sin \omega t$)
1. $I_{max} \sin (\omega t + \phi)$
 2. $I_{max} \sin (\omega t - \phi)$
 3. $I_{max} \sin \omega t$
 4. $I_{max} \sin (\omega t + \pi/2)$
 5. $I_{max} \sin (\omega t - \pi/2)$
 6. $I_{max} \sin (\omega t - \pi)$

484. List 1
(Quantity)
- A Resistance
 - B Reactance
 - C Impedance
 - D Ohm
- List 2
(Reciprocal)
1. Seimen
 2. Admittance
 3. Conductance
 4. Susceptance

Codes:	A	B	C	D
a.	3	4	2	1*
b.	1	2	3	4
c.	2	3	4	1
d.	4	3	2	1

485. The response of a series R-L-C circuit fed from a fixed rms voltage and variable frequency source is represented graphically in the given figure. Match list 1 with list 2 and select the correct answer using the codes given below the lists :



- List 1
(Curve)
- A. AA
 - B. BB
 - C. CC
 - D. DD
- List 2
(Quality)
1. Current
 2. Impedance
 3. Capacitive reactance
 4. Net reactance
 5. inductive reactance

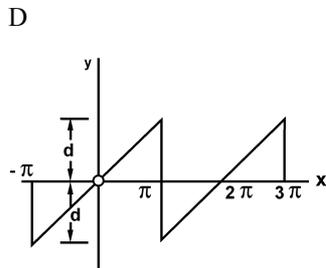
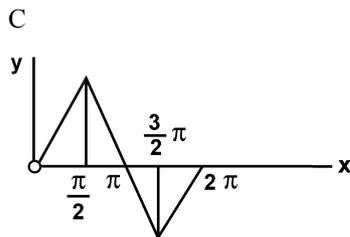
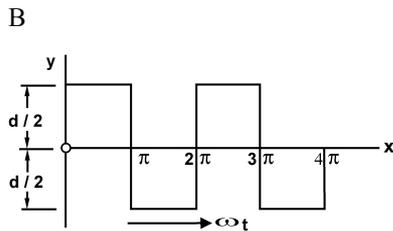
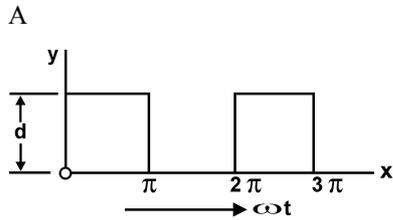
Codes :	A	B	C	D
a.	2	1	3	5
b.	1	2	3	5
c.	1	2	3	4 *
d.	1	2	4	3

486. A sinusoidal voltage source $50 \angle 0^\circ$ with an internal impedance $10 + j 20$ is connected to a load Z_L which is variable is both resistance and reactance. Match list I with list II for maximum power transfer and select the correct answer using the codes given below the lists

- List I
- A Load impedance
 - B Total impedance
 - C Current
 - D Maximum Power
- List II
1. 62.5
 2. $10 + j 20$
 3. 2.5
 4. 20
 5. $10 - j 20$
 6. $2.5 - j 2.5$

Codes :	A	B	C	D
a.	5	2	3	4
b.	5	4	3	1 *
c.	2	4	6	1
d.	2	5	6	4

487. List
(Waveforms)



List 2
(Expression)

- $Y = \frac{d}{2} + \frac{2d}{\pi} \left(\sin \omega t + \frac{1}{3} \sin 3\omega t + \frac{1}{5} \sin 5\omega t + \dots \right)$
- $Y = \frac{2d}{\pi} \left(\sin \omega t + \frac{1}{3} \sin 3\omega t + \frac{1}{5} \sin 5\omega t + \dots \right)$
- $Y = \frac{2d}{\pi} \left(\sin \omega t - \frac{1}{2} \sin 2\omega t + \frac{1}{3} \sin 3\omega t - \frac{1}{4} \sin 4\omega t + \dots \right)$
- $Y = \frac{8d}{\pi^2} \left(\sin \omega t - \frac{1}{9} \sin 3\omega t + \frac{1}{25} \sin 5\omega t - \frac{1}{49} \sin 7\omega t + \dots \right)$

Codes :	A	B	C	D
a.	1	2	3	4
b.	1	2	4	3 *
c.	2	1	3	4
d.	2	1	4	3

488. Fourier series representation of a periodic function, in general contains sine and cosine terms corresponding to the fundamental frequency and several harmonic components. However, some of these harmonic components will be absent for specific types of periodic functions. The periodic waveforms are shown in Table A; match the corresponding property listed in Table B.

Table A

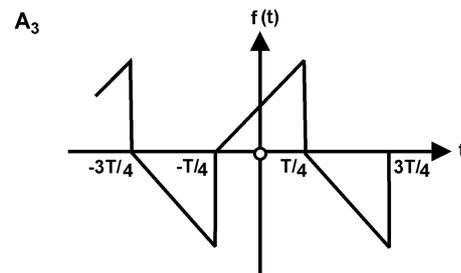
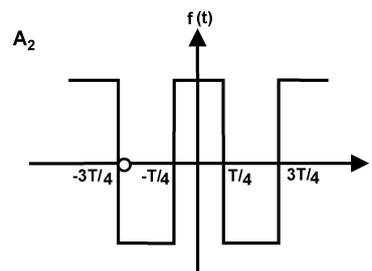
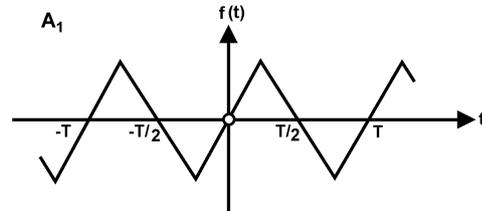


Table B

- Both sine and cosine terms are present in the Fourier series of $f(t)$
- Only sine terms are present in the Fourier series of $f(t)$
- Only cosine terms are present in the Fourier series of $f(t)$

Codes:	A ₁	A ₂	A ₃
a.	2	3	1 *
b.	1	2	3
c.	2	1	3
d.	1	3	2

489. List 1
(Time functions)

- 1
- t
- $\sin \omega t$
- $\cos \omega t$

List 2
(Laplace transforms)

- $1/s$
- $1/s^2$
- $s / (s^2 + \omega^2)$
- $\omega / (s^2 + \omega^2)$

Codes :	A	B	C	D
a.	1	2	3	4
b.	2	1	3	4
c.	1	2	4	3*
d.	2	1	4	3

490. List 1
(Time function)

A $t e^{at}$

B $1 - e^{-at}$

C $e^{-at} \sin \omega t$

D $1 - \cos \omega t$

Codes :	A	B	C	D
a.	1	2	3	4 *
b.	1	3	4	2
c.	1	2	4	3
d.	2	3	4	1

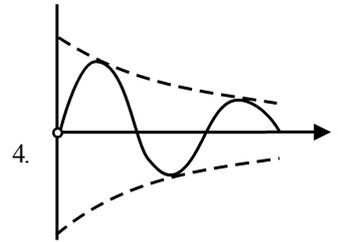
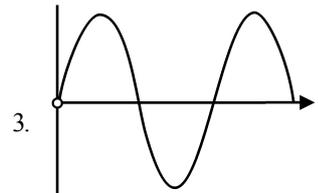
List 2
(Laplace transform)

1. $\frac{1}{(s - a)^2}$

2. $\frac{a}{s(s + a)}$

3. $\frac{\omega}{(s + a)^2 + \omega^2}$

4. $\frac{\omega^2}{s(s^2 + \omega^2)}$



Codes :	A	B	C	D
a.	2	1	4	3*
b.	1	2	4	3
c.	2	1	3	4
d.	1	2	3	4

491. List 1
(Time function)

A $\sin \omega t$

B $\cos \omega t$

C $\sin h \omega t$

D $\cos h \omega t$

Codes :	A	B	C	D
a.	1	2	3	4
b.	2	1	4	3
c.	3	1	4	2
d.	4	1	2	3

List 2
(Laplace Transform)

1. $\omega / (s^2 + \omega^2)$

2. $s / (s^2 + \omega^2)$

3. $\omega / (s^2 - \omega^2)$

4. $s / (s^2 - \omega^2)$

493. Transmission lines connect
- generating station to a switching station/stepdown transformer station. *
 - stepdown transformer station to service transformer banks.
 - distribution transformer to consumer premises.
 - service points to consumer premises.

494. A 3-phase, 4-wire system is commonly used for
- primary distribution.
 - secondary distribution.*
 - primary transmission.
 - secondary transmission.

495. Which of the following is usually not the generating voltage ?
- | | |
|-------------|------------|
| a. 6.6 KV | b. 11 KV |
| c. 12.5 KV* | d. 13.2 KV |

496. The highest transmission voltage in India is
- | | |
|-----------|------------|
| a. 750 KV | b. 400 KV* |
| c. 220 KV | d. 132 KV |

497. The voltage falling under the category of extra high voltage are
- | | |
|-----------------------|----------------------|
| a. 230 KV and above.* | b. 132 KV and above. |
| c. 66 KV and above. | d. 400 KV and above. |

498. 750 KV fall under the category of
- | | |
|------------------------|-------------------------|
| a. extra high voltage. | b. ultra high voltage.* |
| c. high voltage. | d. medium high voltage. |

499. Large industrial consumers are supplied power at
- | | |
|-----------|-----------|
| a. 400 KV | b. 11 KV* |
| c. 66 KV | d. 132 KV |

500. The domestic consumers are supplied power at
- | | |
|-----------|-----------|
| a. 230 V* | b. 400 V |
| c. 600 V | d. 440 KV |

492. List 1
(Transfer function)

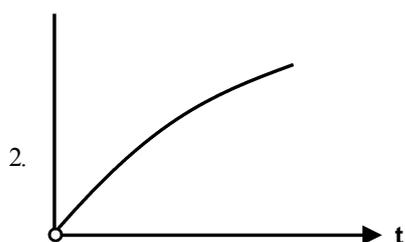
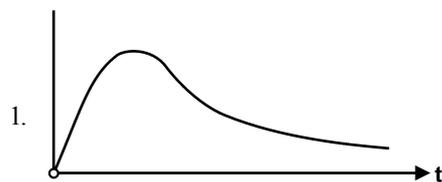
A $\frac{1}{s(s+1)}$

c. $\frac{1}{s(s+1)+1}$

List II
(Impulse response)

B. $\frac{1}{(s+1)^2}$

d. $\frac{1}{s^2+1}$



501. In a transmission system the feeder supplies power to
- transformer substations (step-up).
 - service mains.
 - distributors.*
 - all of the above.
502. The conductor connecting consumer's terminals to the distributor is called the
- feeder
 - distributor
 - service main*
 - none of the above
503. Feeder is designed mainly from the point of view of
- its current carrying capacity*
 - voltage drop in it.
 - operating voltage.
 - operating frequency.
504. Distributors are designed from the point of view of
- its current carrying capacity.
 - operating voltage.
 - voltage drop in it.*
 - operating frequency.
505. The most suitable way of providing electric supply to a multi storey building is by means of
- rising main.*
 - overhead line.
 - paper insulated cable.
 - PVC insulated armoured cable.
506. As per IE rules the maximum allowable variation between declared and actual voltage at consumer's premises should be
- $\pm 6\%$
 - $\pm 8\%$
 - $\pm 5\%$ *
507. Transmission of electric power by high voltage dc system is superior to that by ac system in respect of
- economy
 - inductance, capacitance, phase displacement and surge problem.
 - skin effect and charging current.
 - all of the above.*
508. The main advantage of ac transmission over dc transmission system is
- less insulation problems.
 - low losses in transmission over long distances.*
 - less instability problem.
 - low corona loss and reduced interference with communication circuits.
509. The electric power can be transmitted by
- overhead system.
 - underground system.
 - either a. or b.*
 - none of the above.
510. In India high voltage transmission is mostly by
- overhead system.*
 - underground system.
 - both a. and b.
 - none of the above.
511. Transmission and distribution of electric power by underground system is superior to overhead system in respect of
- appearance and public safety.
 - maintenance cost.
 - frequency of faults, power failure and accidents.
 - all of the above.*
512. The main drawback (s) of underground system over overhead system is/are
- exposure to lightning.
 - heavy initial cost.*
 - exposure to atmospheric hazards such as smoke, ice, wind etc.
 - inductive interference between power and communication circuits.
513. The main drawback (s) of overhead system over underground system is/are
- underground system is more flexible than overhead system.
 - higher charging current.
 - surge problem.*
 - high initial cost.
514. The underground system cannot be operated above
- 220KV
 - 66KV*
 - 33KV
 - 11KV
515. Overhead system can be designed for operation upto
- 400KV*
 - 220KV
 - 132KV
 - 66KV
516. By increasing the transmission voltage to double of its original value the same power can be despatched keeping the line loss
- equal to original value.
 - half the original value.
 - double the original value.
 - one-fourth of original value.*
517. For the same voltage drop, increasing the voltage of a distributor n-times.
- reduces the x-section of the conductor by n-times.*
 - increases the x-section of the conductor by n-times.
 - reduces the x-section of the conductor, by n^2 -times.
 - increases the x-section of the conductor by n^2 -times.
518. In a transmission system, the weight of copper used is proportional to
- E^2
 - E
 - $1/E^2$ *
 - $1/E$
 - None of the above.
519. The volume of copper required for an ac transmission line is inversely proportional to
- current
 - voltage
 - pf
 - both b. and c.*
520. Transmitting power remaining the same, if the supply

- voltage of a dc 2-wire distributor is doubled saving in copper will be
- 25%
 - 50%*
 - 75%
 - 100%
521. In a dc 2-wire feeder, voltage drop per wire is 2.5%, transmission efficiency of the feeder will be
- 97.5%
 - 95%*
 - 93.75%
 - 98.75%
522. For a given amount of power to be transmitted over a certain distance with fixed power loss, the volume of copper required is
- directly proportional to voltage.
 - inversely proportional to voltage.
 - inversely proportional to the square of voltage and pf of the load.*
 - directly proportional to the square of the voltage and pf of the load.
523. Which of the following distribution systems is the most economical ?
- DC system.*
 - Single phase ac system.
 - Three phase, 3-wire ac system.
 - Three phase, 4-wire ac system.
524. Which of the following distribution systems is not normally used ?
- 3 phase, 3-wire.
 - 3 phase, 4-wire.
 - Single phase, 3-wire.*
 - Single phase, 2-wire.
525. Which of the following distribution system is preferred for good efficiency and high economy ?
- Single phase, 2-wire system.
 - 2-phase, 3-wire system.
 - 3-phase, 3-wire system.
 - 3-phase, 4-wire system.*
526. With the same maximum voltage to earth, which of the following ac system with 0.8 pf will need more copper in comparison to dc 2-wire system ?
- Single phase, 2-wire (mid point earthed).
 - Single phase, 3-wire (neutral half of outer).
 - Three phase, 3-wire.
 - Three phase, 4-wire (neutral = outer).*
527. With same maximum voltage between conductors, the ratio of copper volumes needed in 3-phase, 3-wire system and 1-phase, 2-wire system is
- 4/3
 - 3/4*
 - 5/3
 - 3/5
528. The main reason for using high voltage for long distance power transmission is
- reduction in transmission losses.*
 - reduction in time of transmission.
 - increase in system reliability.
 - none of the above.
529. The most economical voltage for transmitting given power over a known distance by overhead transmission lines is about
- 0.3 kv/km
 - 0.6 kv/km*
 - 1.5 kv/km
 - 2.5 kv/km
530. For transmissions of power over a distance of 500 km, the transmission voltage should be in the range of
- 11-22 kv
 - 33-66 kv
 - 66-110 kv
 - 132-220 kv*
531. 66 kv is suitable for transmission of power over
- 30 km
 - 66 km*
 - 120 km
 - 220 km
532. If a power of 30 MW is to be transmitted over a distance of 160 km, the desirable transmission voltage will be
- 33 kv
 - 66 kv
 - 110 kv*
 - 220 kv
533. Which of the curve shown in the fig-2.49 represents the relation between capital cost and the transmission voltage ?
- Curve I*
 - Curve II
 - Curve III
 - Curve IV

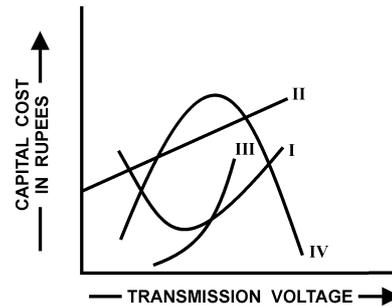


Fig-2.49

534. If variable part of annual cost on account of interest and depreciation on the capital out lay is equal to the annual cost of electrical energy wasted in the conductors, the total annual cost will be minimum and the corresponding size of conductor will be the most economical. This statement is known as
- Lenz's law
 - Kelvin's law*
 - Faraday's law
 - Ohm's law
535. For high voltage transmission lines, conductors are suspended from towers so as to
- increase clearance from ground.*
 - reduce clearance from ground.
 - take care of increase in length.
 - reduce wind and snow effects.
536. The supports used for transmission lines should have the characteristics (s) of
- high mechanical strength and longer life.
 - good looking, light in weight and easily accessible for painting and erection of line conductors.
 - cheap in initial as well in maintenance cost.
 - all of the above.*

560. Galvanised steel wire is usually used as
 a. stray wire b. earth wire
 c. structural components*
 d. all of the above
561. The material used for the manufacture of ground wire is
 a. aluminium b. galvanised steel*
 c. cast iron d. stainless steel
562. Guy wire is employed for
 a. providing protection against surges.
 b. providing emergency earth route.
 c. supporting the pole.*
 d. all of the above.
563. The material (s) used in overhead transmission line is/ are
 a. steel-cored aluminium. b. galvanised steel.
 c. cadmium copper. d. all of the above.*
564. Which of the following materials is not used for transmission and distribution of electrical power ?
 a. Tungsten* b. Copper
 c. Aluminium d. Cadmium copper
565. The sag of a transmission line is least affected owing to
 a. weight of the conductor.
 b. current through the conductor.*
 c. atmospheric temperature.
 d. ice deposited on the conductor.
566. Increase in temperature in overhead transmission lines causes
 a. increase in stress and length.
 b. decrease in stress and length.
 c. decrease in stress but increase in length.*
 d. none of the above.
567. In a transmission line sag depends upon
 a. span length.
 b. tension in conductors.
 c. weight of the conductor per unit length.
 d. all of the above.*
568. In a transmission line sag depends upon
 a. conductor material
 b. the tension in conductors
 c. length of span
 d. all of the above*
569. Between two supports, due to sag the conductor takes the form of
 a. semi-circle b. catenary*
 c. hyperbola d. none of the above
570. The effect of ice deposition on conductor is to increase the
 a. weight of the conductor.*
 b. transmission losses.
 c. resistance to flow of current.
 d. skin effect.
571. Which of the following statements is correct ?
 a. Ice on conductors increases skin effect.
 b. Wind pressure reduces corona effect.
 c. Wind pressure is taken to act at perpendicular to that for ice.*
 d. Ice on conductors reduces sag.
572. The sag of the conductors of a transmission line is 2.5 m when the span is 250 m. Now if the height of supporting tower is increased by 25%, the sag will
 a. reduce by 25% b. increase by 25%
 c. reduce by 12.5% d. remain unchanged.*

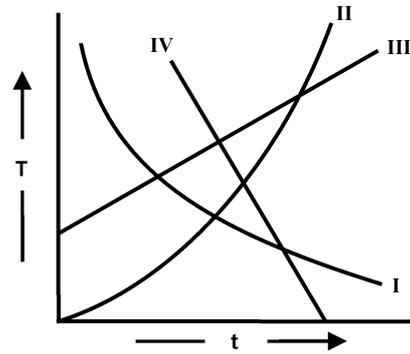


Fig-2.50

573. In an overhead transmission line with the conductors supported between two supports, the variation in tension T with atmospheric temperature t is represented by (Ref.fig-2.50)
 a. curve I* b. curve II
 c. curve III d. curve IV
574. Stringing chart is useful
 a. for finding the sag in the conductor*
 b. in the design of tower.
 c. in the design of insulator ring.
 d. finding the distance between towers.
575. Hot template curves are plots of
 a. temperature and humidity
 b. conductor sag and span lengths*
 c. conductor weight and sag
 d. none of the above.
576. The effect of wind pressure is more predominant on
 a. insulators b. transmission lines
 c. supporting towers* d. none of the above
577. The minimum clearance of high voltage lines from ground across streets is
 a. 3 m b. 5 m
 c. 6 m* d. 8 m
578. Minimum horizontal clearance of a low voltage line from residential buildings must be
 a. 0.6 m b. 1.2 m*
 c. 0.9 m d. 1.6 m

579. If a 132 kv line passes over a residential building, the minimum vertical clearance from the roof of the building shall be
 a. 4.57 m* b. 5 m
 c. 6 m d. 3 m
580. The minimum clearance between 132 kv transmission line and ground is about
 a. 6.4 m* b. 3.2 m
 c. 10.5 m d. 7.5 m
581. The horizontal spacing between phase conductors of a 132 kv transmission line is about
 a. 8 m b. 6 m*
 c. 4 m d. 2 m
582. Stranded conductors usually have a central wire around which there are successive layers of 6, 12, 18, 24 wire. For n-layers, the total number of individual wires is
 a. $3n(n+1)$ b. $2n(n+1)$
 c. $3n(n+1)+1$ * d. $2n(n+1)+1$
583. The diameter of each strand is d then the diameter of n-layer stranded conductor will be
 a. $(2n+1)d$ * b. $3(n+1)d$
 c. $(2n-1)d$ d. $3(n-1)d$
584. What will happen when a line conductor of an overhead supply line breakdown and touches the earth ?
 a. Current will flow to earth.*
 b. Supply voltage will increase.
 c. No current will flow in the conductor.
 d. None of the above.
585. The topmost conductor in hv transmission line is
 a. R-phase conductor. b. Y-base conductor.
 c. B-phase conductor. d. earth conductor.*
586. The colour of the neutral wire of 3-core flexible cable is
 a. blue* b. red
 c. black d. brown
587. Insulators used on EHT transmission lines are made of
 a. PVC b. porcelain*
 c. glass d. stellate
588. Which of the following materials is not a constituent of material used in making porcelain insulators ?
 a. Kaolin b. Quartz
 c. Silica* d. Felspar
589. HV transmission line uses
 a. pin type insulators. b. suspension insulators.
 c. both a. and b.* d. none of the above.
590. Pin type insulators are generally not used for voltages exceeding
 a. 66 kv b. 33 kv*
 c. 25 kv d. 11 kv
591. The insulators used on 220 kv transmission lines are of
 a. suspension type* b. pin type
 c. shackle type d. none of the above
592. Strain type insulators are used
 a. at dead ends.
 b. at intermediate anchor towers.
 c. on straight runs.
 d. any of a. or b.*
593. For a 66 kv transmission line the number of disc insulators used is
 a. 8 b. 6*
 c. 4 d. 2
594. The string efficiency of a string of suspension insulators is dependent on
 a. size of the insulators.
 b. number of discs in the string.*
 c. size of tower.
595. 100 per cent string efficiency means
 a. one of the insulator discs shorted.
 b. zero potential across each disc.
 c. equal potential across each insulator disc.*
 d. none of the above.
596. If the frequency of a transmission system is changed from 50 Hz to 100 Hz, the string efficiency
 a. will increase
 b. will decrease
 c. remain unchanged*
 d. may increase or decrease depending on the line parameters.
597. A 66 kv system has string insulator having five discs and the earth of disc capacitance ratio of 0.10. The string efficiency will be
 a. 89 % b. 75 %
 c. 67 %* d. 55 %
598. If the voltage across the units in a two string insulator of 22 kv system are 12 kv and 10 kv respectively, the ratio of capacitance of the insulator to that of its capacitance to earth will be
 a. 80 % b. 60 %
 c. 40 % d. 20 %*
599. The string efficiency of insulators can be increased by
 a. reducing the number of strings.
 b. increasing the number of strings.
 c. correct grading of insulators of various capacitances.*
 d. changing the orientation of strings.
600. String efficiency can be improved by
 a. using long cross-arms.
 b. using a guard ring.
 c. grading the insulators.
 d. any of the above.*

601. The ratio of puncture voltage to the flashover voltage of a line insulator is
- equal to 1
 - lower than 1
 - much greater than 1*
 - non-sinusoidal*
602. The insulators used in guy cables are
- egg or stay insulators.*
 - shackle insulators.
 - pin type insulators.
 - disc type insulators.
603. The insulators may fail due to
- flash over.
 - short-circuits.
 - deposition of dust.
 - any of the above.*
604. The purpose of guard ring in transmission lines is to
- reduce the earth capacitance of the lowest unit.*
 - increase the earth capacitance of the lowest unit.
 - reduce the transmission line losses.
 - none of the above.
605. Which of the following statements is true regarding corona ?
- Corona takes place at a voltage lower than breakdown voltage.*
 - Corona takes place at a voltage higher than breakdown voltage.
 - Corona is a current phenomenon.
 - Corona increases the transmission line efficiency.
606. Which of the following statements regarding corona are true ?
- It causes radio interference.
 - In attenuates lightning surges.
 - It amplifies switching surges.
 - It causes power loss.
 - It is more prevalent in the middle conductor of a transmission line employing a flat conductor configuration.
- Select the correct answer using the codes given below.
Codes:
- 1, 3, 5
 - 2, 3, 4
 - 1, 2, 4, 5*
 - 2, 3, 4, 5
607. Corona is accompanied by
- violet visible discharge in darkness.
 - hissing sound.
 - vibration.
 - power loss.
 - radio interference.
 - ozone
 - all of the above.*
608. Ozone effect can be detected by
- presence of ozone detected by odour.
 - hissing sound.
 - faint luminous glow of bluish colour.
 - all of the above*
609. The current drawn by the line owing to corona loss is
- non-sinusoidal*
 - sinusoidal
 - dc
 - square
610. In context of corona, with smooth and polished conductors
- there will be no corona glow.
 - corona glow will be uniform along the length of the conductor.*
 - there will be minimum power loss.
 - hissing sound will be more intense.
611. Corona loss can be reduced by the use of hollow conductors because
- the current density is reduced.
 - the eddy current in the conductor is eliminated.
 - for a given cross-section, the radius of the conductor is increased.*
 - of better ventilation in the conductor.
612. The reduce corona effect usually
- the distance between the conductors is reduced.
 - the conductor diameter is reduced.
 - bundled conductors are used.*
 - stranded conductors are used.
613. Corona loss in transmission line is dependent on
- diameter of the conductor*
 - material of the conductor
 - height of the conductor
614. Corona occurs between two transmission conductors when they
- have high potential difference.
 - are closely spaced.
 - carry d c power.
 - both a. and b.*
615. In context of corona which statement is not true ?
- Corona is voltage effect.
 - Corona takes place on short transmission lines.*
 - Corona is accompanied with power loss.
 - Corona attenuates lightning surges.
616. Corona can be reduced by
- increasing the operating voltage.
 - reducing the spacing between conductors.
 - increasing the effective conductor diameter.*
 - any of the above.
617. In humid weather the corona occurs at a voltage
- much less than that needed in fair weather.*
 - much higher than that needed in fair weather.
 - equal to that needed in fair weather.
 - none of the above.
618. Which of the following affects the corona least ?
- Mean free length.
 - Atmospheric temperature.*
 - Number of ions.
 - Size and charge per ion.

619. The effect of corona is
 a. increased inductance. b. increased reactance.
 c. increased power loss.* d. all of the above.
620. The chances of occurrence of corona are maximum during
 a. humid weather.* b. dry weather.
 c. winter d. hot summer.
621. Corona is likely to occur maximum in case of
 a. distribution lines. b. transmission lines.*
 c. domestic wiring. d. service mains.
622. Corona is affected by
 a. size of conductor.
 b. shape and surface condition of the conductor.
 c. operating voltage.
 d. all of the above.*
623. The only advantage of corona is that is
 a. produces a pleasing luminous glow.
 b. makes line current sinusoidal.
 c. works as a safety valve for surges.*
 d. ozone gas is produced.
624. Presence of ozone owing to corona
 a. improves the pf. b. reduces the pf.
 c. corrodes the material.* d. improves regulation.
625. Corona has the disadvantage(s) of
 a. power loss.
 b. interference with neighbouring communication circuits.
 c. introducing the harmonics, predominately third harmonics, into the transmission lines.
 d. all of the above.*
626. The dielectric strength of air under normal conditions is around
 a. 30 kv/cm* b. 100 kv/cm
 c. 150 kv/cm d. 200 kv/cm
627. Corona usually occurs when the electrostatic stress in the air around the conductor exceeds
 a. 40 kv/cm (maxm). b. 30 kv/cm (maxm).*
 c. 22 kv/cm (maxm). d. 6.6 kv/cm (maxm).
628. The dielectric strength of air is
 a. proportional to barometric pressure.*
 b. proportional to absolute temperature.
 c. inversely proportional to barometric pressure.
 d. none of the above.
629. Visual critical voltage is
 a. lower than disruptive critical voltage.
 b. higher than disruptive critical voltage.*
 c. equal to critical voltage.
 d. none of the above.
630. Power loss due to corona is directly proportional to
 a. spacing between conductors.
- b. radius of conductor.
 c. supply frequency.*
 d. none of the above.
631. Critical voltage limit of a transmission line is increased by
 a. increasing the radius of the conductors.*
 b. increasing the spacing between conductors.
 c. reducing the spacing between conductors.
 d. reducing the radius of the conductors.
632. Transmission line constant are
 a. resistance b. inductance
 c. capacitance d. all of these*
633. The inductance of line is minimum when
 a. G M D is high.
 b. G M R is high.
 c. both G M D and G M R are high.
 d. G M D is low but G M R is high.*
634. The inductance of single phase two wire power transmission line per km gets doubled when the
 a. distance between the wires is doubled.
 b. distance between the wires is increased four fold.
 c. distance between the wires is increased as square of the original distance.*
 d. radius of the wire is doubled.
635. Capacitance of a transmission line
 a. increases* b. decreases
 c. remains same with increase in its length.
636. Capacitance in equivalent circuit of a transmission line is due to
 a. current in the line.
 b. difference in potential of line.*
 c. leakage of current.
 d. presence of magnetic flux.
637. The ratio of line to line capacitance and line to neutral capacitance is
 a. 1/2* b. 1/4
 c. 2 d. 4
638. In a transmission line the distributed constants are
 a. resistance and shunt conductance only.
 b. resistance and inductance only.
 c. resistance, inductance and capacitance only.
 d. resistance, inductance, capacitance and shunt conductance.*
639. Skin effect depends upon
 a. x-section of conductor.
 b. supply frequency.
 c. permeability of conductor material.
 d. all of the above.*
640. Skin effect in transmission line is due to
 a. supply frequency.
 b. self inductance of conductor.

- c. high sensitivity of material in the centre.
d. both a and b.*
641. The effective resistance of a conductor will be the same as ohmic resistance when
a. voltage is low.
b. current is true sinusoidal.
c. current is uniformly distributed in the x-section of the conductor.*
642. When an alternating current flows through a conductor
a. entire current passes through the core of the conductor.
b. portion of conductor near the surface carries more current in comparison to the core.*
c. current remains uniformly distributed over the whole x-section of the conductor.
d. portion of conductor near the surface carries less current in comparison to the core.
643. The conductor carries more current on the surface in comparison to its core. This phenomenon is called the
a. skin effect* b. corona
c. Ferranti effect d. Lenz's effect.
644. Increase in frequency of transmission line causes
a. no change in line resistance.
b. increase in line resistance.*
c. decrease in line resistance.
d. decrease in line series reactance.
645. Skin effect exists in
a. cable carrying d c current.
b. d c transmission line only.
c. a c transmission line only.*
d. d c as well as a c transmission lines.
646. Skin effect is noticeable only at
a. high frequencies.* b. low frequencies.
c. audio frequencies. d. none of the above.
647. Which of the following parameters depend upon the supply frequency ?
a. R and C only b. L and C only
c. R and L only d. R, L, C and G*
648. Skin effect
a. increases the effective resistance and effective internal reactance.
b. reduces the effective resistance and effective internal reactance.
c. increases the effective resistance but reduces the effective internal reactance.*
d. reduces the effective resistance but increases the effective internal reactance.
649. The skin effect of a conductor reduces with the increase in
a. supply frequency.
b. resistivity of the conductor material.*
c. x-section of conductor.
- d. permeability of conductor material.
650. Skin effect in conductor is proportional to
a. (diameter of conductor)^{1/2}
b. diameter of conductor.
c. (diameter of conductor)²*
d. (diameter of conductor)⁴
651. In order to reduce the skin effect at U H F
a. copper tubes with silver plating are used.*
b. copper rods with silver plating are used.
c. anodised conductors are used.
d. painted conductor are used.
652. The presence of earth in case of overhead lines
a. increases the capacitance.*
b. increases the inductance.
c. decreases the capacitance.
d. decreases the inductance.
653. If the effect of earth is taken into account, then the capacitance of line to ground
a. decreases. b. increases.*
c. remains unaltered. d. becomes infinite.
654. The presence of earth in case of overhead lines
a. increases the capacitance.*
b. increases the inductance.
c. decrease the capacitance and increases the inductance.
d. does not effect any of the line constants.
655. If the height of transmission towers is changed, which of the following meters is likely to change ?
a. Resistance. b. Capacitance.
c. Inductance.* d. None of the above.
656. Transposition of the ----- reduce the
a. line losses.
b. capacitive effect.
c. disturbances to nearby communications circuits*
d. effect of surge voltages induced on the line.
657. Transposition of transmission line is done to
a. reduce line loss.
b. reduce skin effect.
c. balance line voltage drop. *
d. reduce corona.
658. High voltage transmission lines are transposed because then
a. corona losses can be minimized.
b. computation of inductance becomes easier.
c. voltage drop in the lines can be minimized.
d. phase voltage imbalances can be minimized.*
659. Compared with a solid conductor of the same radius, corona appears on a stranded conductor at a lower voltage, because stranding
a. assists ionisation.

- b. makes the current flow spirally about the axis of the conductor.
 c. Produces oblique sections to a plane perpendicular to the axis of the conductor.
 d. produces surfaces of smaller radius.*
660. Proximity effect
 a. is more pronounced for large conductors, high frequencies and close proximity.
 b. increases the resistance of the conductors and reduces the self reactance.
 c. is substantially eliminated with stranded conductors.
 d. all of the above.*
661. Following effect are associated with transmission lines
 1 Skin effect 2 Corona effect
 3 Proximity effect
 The effective resistance of a conductor is increased by
 a. 1 only b. 2 and 3 only
 c. 1 and 3 only* d. 1, 2 and 3
662. The transmission lines are said to be long if the length of the line exceeds
 a. 50 km b. 150 km*
 c. 250 km d. 500 km
663. Shunt capacitance is neglected in case of
 a. short transmission lines.*
 b. medium transmission lines.
 c. long transmission lines.
 d. medium and long transmission lines.
664. The effect of capacitance can be neglected when the length of overhead transmission line does not exceed
 a. 20 km b. 60 km*
 c. 120 km d. 300 km
665. 120 km long transmission line is considered as a
 a. short line b. medium line*
 c. long line d. either a. or b.
666. A 25 km 33 kv transmission line is considered to be'
 a. short transmission line.*
 b. medium transmission line.
 c. long transmission line.
 d. high power line.
667. A 160 km, 110 kv transmission line falls under the category of
 a. short transmission line.
 b. medium transmission line.
 c. long transmission line.*
 d. ultra high voltage line.
668. Which of the following is neglected while analysing a short transmission line ?
 a. Shunt admittances*. b. Power losses.
 c. Series impedance d. None of the above.
669. For 11 kv transmission line the inductance per km will be about
 a. 1 H b. 0.1 H
 c. 1 mH* d. 0.1 mH
670. For 11 kv transmission line the capacitance per km will be about
 a. 0.01 F* b. 0.1 F
 c. 0.01mF d. 0.1mF
671. Percentage regulation of a transmission line is given by the expression
 a. $\frac{V_R - V_S}{V_R} \times 100$ b. $\frac{V_R - V_S}{V_S} \times 100$
 c. $\frac{V_S - V_R}{V_R} \times 100$ * d. $\frac{V_S - V_R}{V_S} \times 100$
672. Which of the following regulation is considered best ?
 a. 21/2 %* b. 15 %
 c. 25 % d. 40 %
673. A single phase line is transmitting 1,100 kw power to a factory at 11 kv and at 0.8 pf lagging. It has a total resistance of 2W and a loop reactance of 3W. The voltage at sending end, percentage regulation and transmission efficiency will be respectively.
 a. 11854 V; 7.76% and 94.62 %.
 b. 11426 V; 3.73% and 97.24 %.
 c. 11426 V; 3.87% and 97.24%.*
 d. 11426 V; 3.87% and 94.62%.
674. For a short line if the receiving end voltage is equal to sending end voltage under loaded conditions
 a. the sending end power factor is unity.
 b. the receiving end power factor is unity.
 c. the sending end power factor is leading.
 d. the receiving end power factor is leading.*
675. Transmission efficiency of a transmission line increases with the
 a. decrease in power factor and voltage.
 b. increase in power factor and voltage.*
 c. increase in power factor but decrease in voltage.
 d. increase in voltage but decrease in power factor.
676. Constant power locus of a transmission line at a particular sending end and receiving end voltage is
 a. a straight line b. a circle*
 c. a parabola d. an ellipse
677. If L, C and Y are the inductance, capacitance and shunt admittance of a line per unit length, then for length l
 a. the shunt admittance is Y.l.*
 b. the inductance is L/l.
 c. the capacitance is C/l.
 d. the shunt admittance is Y/l.
678. In medium transmission lines the shunt capacitance is taken into account in

- a. end condenser method.
 b. p method.
 c. T-method.
 d. all of the above.*
679. For an ac transmission line of length not exceeding 80 km, it is usual to lump the line capacitance at
 a. the sending end. b. the receiving end.*
 c. the mid point. d. any convenient point.
680. Under no load conditions, the current in a transmission line is because of
 a. capacitance effect.* b. corona effect.
 c. proximity effect. d. back flow from earth.
681. Charging current in transmission line
 a. reduces the line losses.
 b. increases the line losses.*
 c. will not affect the line losses.
 d. unpredictable.
682. Which of the following statements are correct ?
 a. Flow of unduly heavy current is Ferranti effect.
 b. Ferranti effect occurs under unloaded conditions of line.
 c. The rise in receiving end voltage is Ferranti effect.
 d. Both b and c combined is Ferranti effect.*
683. The phenomenon of rise in lightly load voltage of the open circuit line is called the
 a. Proximity effect b. skin effect
 c. Ferranti effect* d. See beck effect
684. For a long distance h v transmission line the receiving end voltage under unloaded conditions is
 a. much lower than b. lower than
 c. equal to
 d. higher than the sending end voltage.*
685. In a long transmission line under no-load condition
 a. the receiving end voltage is less than the sending end voltage.
 b. the sending end voltage is less than the receiving end voltage.*
 c. the sending end voltage is equal to the receiving end voltage.
 d. none of these.
686. Ferranti effect on long over head line is experienced when it is
 a. lightly loaded.*
 b. on full load at unity pf.
 c. on full load at 0.8 pf lead.
 d. on any load.
687. The A B C D constants of a 3 phase transposed transmission line with linear and passive elements
 a. are always equal. b. never equal.
 c. A and D are equal.* d. B and C are equal.
688. In terms of constants A, B, C and D for short transmission lines, which of the following relation(s) is/are valid ?
 a. $A = D = 1$ b. $C = 0$
 c. $B = Z$ d. all of the above*
689. For a medium length transmission line, A is
 a. equal to B. b. equal to C.
 c. equal to D.*
 d. equal to any of the above.
690. The square root of the ratio of line impedance and shunt admittance is known as the
 a. line surge impedance.* b. line conductors.
 c. line susceptance. d. line regulation.
691. Which of the following statements is correct ?
 a. Surge impedance is the impedance at the time of breakdown of voltage.
 b. Surge impedance and characteristic impedance for a transmission line are the same.*
 c. Surge impedance is the impedance of transmission line when corona take place.
 d. None of the above.
692. The characteristics impedance of a transmission line depends upon
 a. shape of the conductor.
 b. conductivity of the conductor material.
 c. geometrical configuration of the conductors.*
 d. none of the above.
693. In case the characteristic impedance of a transmission line is equal to the load impedance
 a. the system will resonate badly.
 b. all the energy sent will be absorbed by the load.*
 c. all the energy sent will be pass to the earth.
 d. all the energy will be lost in transmission line as transmission losses.
694. In a transmission line of negligible resistance, the surge impedance will be
 a. $\sqrt{\frac{L}{C}}$ * b. $\sqrt{C/L}$
 c. $\frac{1}{\sqrt{LC}}$ d. \sqrt{LC}
695. Characteristic impedance of an overhead transmission line is usually in the range of
 a. 100 to 200 Wt b. 200 to 300 W
 c. 0 to 100 W d. 400 to 500 W*
696. Surge impedance of transmission line is
 a. independent of its length.*
 b. dependent on its length.
697. The critical value of surge impedance of a long transmission line is
 a. 1,000 W b. 400 W*
 c. 250 W d. 50 W

698. When the load on a transmission line is equal to the surge impedance loading
- the receiving end voltage is less than the sending end voltage.
 - the sending end voltage is less than the receiving end voltage.
 - the receiving end voltage is equal to the sending end voltage.*
 - none of these.
699. The propagation constant of a transmission line is given as
- $j\omega\sqrt{LC}$ *
 - $j\sqrt{LC}$
 - $j\sqrt{L/C}$
 - $j\sqrt{C/L}$
700. Use of additional shunt capacitor can be made for increasing the capability of line as it
- reduces surge impedance Z_0 .
 - increases phase shift b.*
 - increase in a.
 - all of the above.
701. To increase the transmission capability of a high voltage long line
- the resistance can be increased.
 - the resistance can be decreased.
 - the series reactance can be reduced.*
 - the shunt admittance can be reduced.
702. Series capacitor is used in a transmission line to
- compensate the voltage drop.*
 - reduce line loss.
 - limit short circuit current.
 - improve load power factor.
703. For a distortionless transmission line
- $RL=GC$
 - $RC=GL$ *
 - $RG=LC$
 - $RLGC=0$
- where G is the shunt conductance between two conductors.
704. Power despatch through a line can be increased by
- installing series capacitors.*
 - installing shunt capacitors.
 - installing series reactor.
 - installing shunt reactor.
705. The power transmitted will be maximum when
- line reactance is high.
 - corona losses are minimum.
 - sending end voltage is more.*
 - receiving end voltage is more.
706. The capacity of a transmission line can be increased by reducing
- line inductance*
 - line capacitance
 - sending end voltage.
 - any of the above.
707. For constant voltage transmission, the voltage drop along the line is maintained constant by installing
- capacitors.
 - inductors.
 - resistors.
 - synchronous phase modifiers at the receiving end*
708. Constant voltage transmission have the drawback(s. of
- increase of short-circuit current of the system.
 - lower reserve of lines in case of line trouble.
 - increased risk of interruption of supply due to falling of synchronous motors out of synchronism.
 - all of the above.*
709. Constant voltage transmission have the drawback(s. of
- requirement of large x-section conductor for transmission of same power.
 - increased risk of interruption of supply.*
 - reduced power factor at the time of moderate and heavy loads.
 - all of the above.
710. Constant voltage transmission have the drawback(s. of
- availability of steady voltage of all loads at the receiving end.
 - possibility of better protection for the line due to possible use of higher terminal reactances.
 - possibility of carrying increased power for a given conductor size in case of long distance heavy power transmission.
 - all of the above.*
711. Constant voltage transmission have the drawback(s. of
- increase of short-circuit current of the system.
 - large reserve of lines in case of line trouble.
 - improvement of power factor at the times of moderate and heavy loads.*
 - all of the above.
712. A synchronous phase modifier as compared to synchronous motor of the same rating has
- larger shaft diameter and higher speed.
 - smaller shaft diameter and higher speed.*
 - larger shaft diameter and smaller speed.
 - smaller shaft diameter and smaller speed.
713. Phase modifier is normally installed in case of
- short transmission lines.
 - medium length lines.
 - long lines.*
 - for any length of lines.
714. Which of the following statements is not true ?
- Synchronous phase modifiers are installed at sending end.*
 - Synchronous phase modifiers are installed at load end.
 - Synchronous phase modifiers are nothing but synchronous motors (specially designed).

- d. Synchronous phase modifiers do not carry load.
715. Over-excited synchronous phase modifier
- draws a lagging current.
 - draws a leading current.*
 - supplies a leading current.
 - supplies a lagging current.
718. Capacitors are used in power system to
- improve supply power factor.
 - improve voltage regulation.
 - change the load characteristics.
 - all of the above.*
719. Series capacitors on transmission lines are of little use when the required reactive volt-amperes are
- small*
 - large
 - fluctuating
 - any of the above

Fill in the blanks

- The voltages induced in the three windings of a three phase alternator are _____ electrical degree apart in time phase. (90, **120**, 360)
- With the exception of two phase windings, it can be stated that in general the electrical displacement between different is $360/n$, where n is the number of _____. (poles, brushes, **phases**)
- The order in which the e.m.f. of phases, a, b and c attain their maximum values is called _____. (phase difference, phase angle, **phase sequence**)
- The phase sequence can be reversed by _____any pairs of lines. (insulating, cutting, **interchanging**)
- During the interconnections of three phases, when similar ends are joined together at a point is known as _____connection. (**star**, delta, mesh)
- In case of a star connection, the point where similar ends are joined together is known as _____point. (line, phase, **neutral**)
- Star connection like inter connected system is known as 3 phase_____ wire system. (one, three, **four**)
- In case of a star connection, the potential difference between any terminal (or line. and neutral point gives the_____voltage. (**phase**, line, total)
- In case of a star connection, the potential difference between any two lines gives the _____voltage. (phase, star, **line**)
- In case of star connection, the line voltage is equal to _____ of phase voltage. (3 , $\sqrt{3}$, $1\sqrt{3}$)
- During the interconnection of three phases, when dissimilar ends are joined together is known as _____ connection. (star, Y, **delta**)
- In delta connections three windings are connected in _____. (parallel, **series**, series-parallel)
- Delta connection is also referred to as 3 phase _____ wire system. (single, **3**, 4)
- In case of a delta connection, the phase current is equal to _____ of line current. (3 , $\sqrt{3}$, $1/\sqrt{3}$)
- For a given line voltage_____ turns/phase are required with Y connection than with a delta connection. (more, equal, **fewer**).
- With _____ connection, the system of distribution mains can be arranged to suit both lightning and power circuits without using transformers. (delta, mesh, **star**)
- Transformers in general, work more satisfactorily with _____connections. (star, Y, **delta**)
- The _____connection is suitable for rotary converters. (star, **delta**)
- Power in a single phase system is _____. (steady, smooth, **pulsating**)
- Power factor of a single phase motor is _____than that of a 3 phase motor of the same output and speed. (greater, **lower**, same)
- For a given size of frame, the output of a 3 phase machine is _____than that of a single phase motor. (**greater**, lower, same)
- Two-wattmeter method can be used to find the _____ of a balanced 3 phase load. (current, impedance, **power factor**)
- The disadvantages of a low power factor is that current required for a given power is _____(very low, zero, **very high**)
- When one of the three equal Y connected load resistors fed by a balanced 3 phase supply is disconnected, power consumption is reduced by _____. (one third, one fourth, **half**)
- In a three phase system synchronous capacitors are used for improving _____. (amplitude factor, form factor, **power factor**)
- A 50 Hz alternating current has a time period of _____. (1 sec., .01 sec., **.02 sec.**)
- The number of cycles / second is called the _____ of the alternative quantity. (Time period, Amplitude, **Frequency**)

28. An alternative having 20 poles and running at 300 r.p.m. will generate alternating voltage and current whose frequency is _____ Hz. (100, 60, **50**)
29. Frequency is given by the reciprocal of the _____ of the alternative quantity. (Cycle, Amplitude, **Time period**)
30. A leading alternative quantity is one which reaches its maximum (or zero. value _____ as compared with the other quantity. (Later, In same time, **Earlier**)
31. A lagging alternating quantity is one which reaches its maximum (or zero. value _____ as compared with the other quantity. (Earlier, In same time, **Later**)
32. A plus (+) sign when used in connection with phase difference, it denotes _____. (In phase, Log, **Lead**)
33. A minus (-) sign when used in connection with phase difference, it denotes _____. (In phase, Lead, **Lag**)
34. Root-Mean-square value is also known as _____ value of an alternating current. (Maximum, Average, **Effective**)
35. The value of alternating voltage recorded by a voltmeter is _____ value. (Average, **r.m.s.**, Maximum)
36. In r.m.s. value of a sinusoidal alternating current is _____ times its maximum value. (0.637, 0.528, **0.707**)
37. In case of a symmetrical alternating current (i.e. one whose two half cycles are exactly similar, wheather sinusoidal or non-sinusoidal., the average value must always be taken over the _____. (**Half cycle only**, Whole cycle)
38. In case of a unsymmetrical alternating current (the average value must always be taken over the _____. (Half cycle only, **Whole cycle**)
39. The knowledge of form factor will enable the r.m.s. value to be found from _____. (Maximum value, Instantaneous value, **Arithmetic mean value**)
40. The knowledge of Aplitude factor is necessary when measuring _____. (Copper losses, Friction losses, **Iron losses**)
41. In a purely resistive circuit power is never zero, because the _____ values of voltage and current are always either both positive or negative and hence the product is always positive. (Average, Maximum, **Instantaneous**)
42. Higher the frequency of an alternating current _____ the reactance offered by a capacitor. (Higher, Double, **Lower**)
43. Average value of a sinusoidal alternating quantity is _____ than its r.m.s. value. (Greater, Same, **Lower**)
44. The crest factor of a sine wave is _____ than its form factor. (**Greater**, Same, Lower)
45. The form factor for half wave rectified current is _____. (**1.57**).
46. The emf induced in a coil rotating in a uniform magnetic field is maximum when the flux linkage by the coil is _____. (**zero**)
47. The opposition of to the flow of an alternating current is called the _____. (**impedance**)
48. In the circuit Fig-2.46 the voltage V_s has a phase angle of _____ with respect to V_L (**600**)

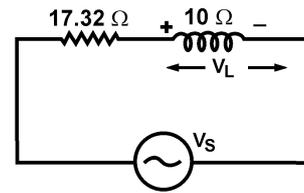


Fig-2.46

49. the increase in resistance due to non-uniform distribution of current in a conductor is known as _____ effect. (**skin**)
50. A series R-L-C circuit has the following parameter values $R = 10\Omega$, $L = 0.01$ H, $C = 100\mu\text{F}$. The-factor of the circuit at resonance is _____. (**1.0**)
51. A parallel a-c circuit draws _____ current when in resonance. (**minimum**)
52. The ability of a resonant circuit to discriminate between one particular frequency and all others is called its _____. (**selectivity**)
53. Selectivites of different resonance circuits are compared in terms of their _____. (**bandwidth**)
54. The ratio of bandwidth to the resonant frequency is called the _____ of the circuit. (**selectivity**)
55. A tuned circuit provides a voltage of known _____ across a known resistance. (**frequency**)
56. If the coil employed in a tuned circuit is of low resistance, its selectivity will be _____. (**high**)
57. In a parallel R-L circuit, the phase angle _____ with the decrease in frequency. (**increase**)
58. The frequency, at which an R-L-C network behaves as a purely resistive network, is called the _____ frequency. (**resonant**)
59. In case of a series circuit Q factor is _____ magnification while in case of parallel circuit it is _____ magnification. (**voltage, current**)

- 60. In a balanced 3-phase star-connected system line voltages are 30° _____ of the respective phase voltages. **(ahead)**
- 61. In a balanced delta-connected system line currents are 30° _____ of the respective phase currents. **(behind)**
- 62. In a 3 - Φ delta connection, line voltage is _____ phase voltage. **(equal to)**
- 63. A delta connected load with 10Ω each forming a starconnected load are connected across a 3 - Φ balanced supply line to line voltage of 400 V. The total power consumed by this load is _____ kW. **(16.0)**
- 64. Three resistors of 10Ω each forming a star connected load are connected across a 3 - Φ balanced supply line to line voltage of 400 V. The total power consumed by this load is _____ kW. **(16.0)**

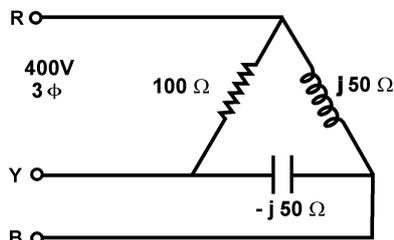


Fig-2.47

- 65. A set of 3 equal resistors, each of value R_x , connected in star across RYB of fig -2.47 consumes the same power as the unbalanced delta-connected load shown. The value of R_x is _____ Ω . **(100)**
- 66. Fourier series of even function do not have _____ terms. **(sine)**
- 67. The Fourier series expansion of a periodic function with half-wave symmetry contains only-harmonics _____. **(odd)**
- 68. A function $f(t)$ satisfying the condition $f(t) = f(-t)$ is said to be an _____ function. **(even)**
- 69. Non-sinusoidal waveforms when applied to an average responding voltmeter will cause the meter to read high or low depending upon the _____ of the waveform. **(form factor)**
- 70. A _____ is an instrument designed to measure the relative amplitudes of signal frequency components in a complex waveform. **(spectrum analyzer)**
- 71. A measure of distortion represented by a particular harmonic is the ratio of _____ of the harmonic to that of fundamental. **(amplitude)**
- 72. Double transients occur in _____ circuits. **(R-L-C)**

- 73. An R-L series circuit can be used as high pass filter if the output is taken as the _____ voltage. **(inductor)**
- 74. An R-C series circuit can be used as high pass filter if the output is taken as the _____ voltage. **(resistor)**
- 75. An R-C coupling circuit is effectively a _____ filter for pulsating dc. **(high pass)**
- 76. A series resonant L-C circuit in series with the load is a _____ filter. **(band pass)**
- 77. For sharper filtering the filters are to be connected in _____. **(cascade)**
- 78. The energy stored in a capacitor is _____ ($\frac{1}{2} CV^2$)
- 79. The equivalent inductance seen at terminals A-B in the fig-2.48 is _____ H. **(8)**

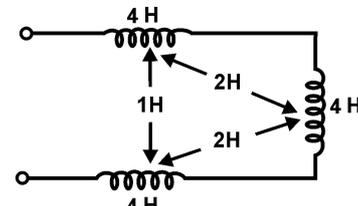


Fig-2.48

- 80. Laplace transformation of $f(t - T)$ is _____ ($E^{-sT}F(s)$)
- 81. Laplace transformation of convolution, we have varying functions is equal to the _____ of L place transformation of each of two functions. **(product)**
- 82. The convolution of two time varying function $f_1(t)$ and $f_2(t)$ is _____. **($f_1(t) * f_2(t)$)**
- 83. The Lplace transform of the impulse function $\delta(t)$ is _____. **(1.0)**
- 84. The convolution of the functions $f_1(t) = e^{-2t}u$ and $f_2(t) = t u(t)$ is equal to _____ ($\frac{1}{4(S+2)} - \frac{1}{4S} + \frac{1}{2S^2}$)

True/FALSE

- 1. It is impossible to change the current through an inductor by finite amount in zero time. **(TRUE)**
- 2. A coil when connected across 230 V dc supply will draw more current in comparison to that when connected across 230 V ac supply. **(TRUE)**
- 3. The inductor of the coil opposes the flow of alternating current. **(TRUE)**
- 4. If the voltages across R,L and C elements connected

- in series in an ac circuit are 300, 100 and 500 V respectively, then the total applied will be 500 volts. (FALSE)
5. The Ohm's law does not hold good in ac circuits. (FALSE)
6. In parallel circuits voltage is same across each branch. (TRUE)
7. The series resonance is also called the current resonance. (FALSE)
8. The frequencies f_1 and f_2 at the limits of the bandwidth are also called half power points on the frequency scale. (TRUE)
9. The actual current input at frequencies f_1 and f_2 is equal to half of the current at resonance. (FALSE)
10. It is necessary that the tuning coil should be of high resistance and low inductance. (FALSE)
11. High value of Q-factor means not only higher magnification but also a higher selectivity of the tuning coil. (FALSE)
12. The parallel resonant circuit the impedance offered is minimum and line currents is maximum. (FALSE)
13. A. Resonance occurs in an R-L-C circuit (simple series or parallel. at a frequency of $\omega_0 = 1/\sqrt{LC}$ (TRUE)
14. The impedance of the Series R-L-C circuit at resonant frequency is maximum. (FALSE)
15. Kirchhoff's current law is valid for an ac circuit containing R, L and C. (TRUE)
16. The sum of rms current at any junction of the circuit is always zero. (TRUE)
17. In delta connected three-phase balanced circuit
1 Line current = phase current $\times \sqrt{3}$.
2 line voltage = phase voltage. (TRUE)
18. For balanced 3-phase circuits the three voltage are equal in magnitude and displaced by 120° . (TRUE)
19. Star-connected alternator needs less number of turns per phase than delta connected alternator to give some line voltage. (TRUE)
20. In star-connected alternator line current is equal to phase current. (TRUE)
21. A. In a 3-phase supply, floating neutral is undesirable. (TRUE)
22. AC varies in magnitude and reverses in polarity. (TRUE)
23. DC voltage has one polarity. (TRUE)
24. Periodic time, T = supply frequency, f (FALSE)
25. Most of the ac instruments (voltmeters and ammeters) indicate average value. (FALSE)
26. Peak-to-peak voltage is twice the peak value of voltage. (TRUE)
27. The phase difference between two alternating quantities is measured by the angular distance between the points where the two curves cross the base or reference line in the same direction. (TRUE)
28. Each 180° (or π radian) rotation of the phasor, one has its peak value when the other is at zero value. (FALSE)
29. When two waves are 90° out of phase, one has its peak value when the other is at zero value. (TRUE)
30. An inductor opposes equally the dc as well as ac. (FALSE)
31. A pure inductance connected across 230 V, 50 ac supply consumes 120 watts. (FALSE)
32. An inductor does not offer any opposition to dc. (TRUE)
33. A capacitor blocks alternating current. (FALSE)
34. The inductors are designed to have low value of Q-factor. (FALSE)
35. The average power P_{av} is equal to one half of the peak power for sinusoidal waveforms. (TRUE)
36. In tuned circuit loaded and unloaded Q are the same. (FALSE)
37. The ratio of the band width to the resonant frequency is called the quality factor. (FALSE)
38. In a series resonant circuit, lower the resistance in the circuit, more steep will be the current response. (TRUE)
39. In a parallel R-L circuit as the frequency increases, impedance Z decreases. (FALSE)
40. In a parallel resonant circuit, the value of resistance has effect on the resonant frequency. (TRUE)
41. When a capacitor is connected in parallel to an inductive circuit, the phase angle increases and PF decreases (FALSE)
42. Tellegen's theorem is applicable to any lumped network. (TRUE)

43. For a network with m meshes, there are $(m - 1)$ independent mesh equations. (TRUE)
44. Every non-sinusoidal waveform has a dc component. (FALSE)
45. Every non-sinusoidal waveform has large number of harmonics. (TRUE)
46. A square wave has only even harmonics. (TRUE)
47. Non-sinusoidal waveforms possessing mirror-image symmetry have only even harmonics. (FALSE)
48. A pure inductance having no initial energy is connected across a pure capacitance having some initial energy. The current in the circuit will eventually decay to zero. (TRUE)
49. Higher time constant of an R-C integrator circuit implies a faster rise or fall of input pulse voltage. (FALSE)
50. A series R-L circuit can be used as low pass filter if the output is taken as the resistor voltage. (TRUE)
51. A series R-C circuit can be used as low pass filter if the output is taken as the resistor voltage. (FALSE)
52. An unwanted high frequency that is superimposed on a low frequency alternating voltage can be attenuated by using low pass filter. (TRUE)
53. A π - type filter with shunt capacitance is a high pass filter. (FALSE)
54. Two basic filter actions are shunting and blocking. (TRUE)
55. In general, a high-pass filter can be used as phase-lag network. (FALSE)
56. A transformer with an isolated secondary winding also is effectively a high pass filter. (TRUE)
57. A bandpass filter attenuates frequencies which fall outside its bandwidth. (TRUE)
58. A wave trap is a bandstop filter. (TRUE)
59. A parallel resonance L-C circuit in series with the load is a bandpass filter. (FALSE)
60. A band-reject filter attenuates frequencies that fall within its reject bandwidth. (TRUE)
61. Filters using both L and C elements usually provide a sharper response than those using only L or C. (TRUE)
62. The function $\exp(t^2)$ does not have a Laplace transform. (TRUE)
63. The system characterised by the equation $y = mx + c_1$ is linear. (TRUE)



CHAPTER - 5

DETAILED KNOWLEDGE OF SERIES AND PARALLEL RESONANCE OF AC CIRCUITS AND THEIR USE, CALCULATION OF RESONANT FREQUENCY OF A CIRCUIT FROM A GIVEN INFORMATION, EFFECT OF CHANGE IN THE FREQUENCY OF THE IMPEDANCE, CURRENT AND PHASE ANGLE

- In a series R - L circuit, the impedance is equal to :
 - $R + X_L$
 - $R^2 + X_L^2$
 - $\sqrt{(R^2 + X_L^2)}$ *
 - $R + X_L^2$
- We know $P = V \times I \cos \phi$, where $\cos \phi$ is known as
 - impedance
 - Admittance
 - Susceptance
 - Power factor *
- In a series R - L circuit, power is consumed due to
 - Ohmic resistance only *
 - Pure inductance only
 - Both ohmic resistance and pure inductance
 - None of the above
- In a series R - L circuit, the power factor may be defined as the ratio of
 - R^2/z
 - Z^2 / R
 - Z / R^2
 - R / Z *
- In a series R - L circuit, consumption of power is equal to :
 - IR watt
 - $I^2 R$ watt *
 - IR^2 watt
 - $I^2 R^2$ watt
- In a series R - L circuit, the ratio between watts and volt-amperes (W/VA) is known as
 - Form factor
 - Admittance
 - Power factor *
 - Susceptance
- Active component of current in a series R - L circuit is that, which is
 - In phase with applied voltage *
 - In quadrature with applied voltage
 - In quadrature with current
 - None of the above
- In a series R - L circuit, the reactive component of current is that, which is
 - In phase with applied voltage
 - In quadrature with applied voltage *
 - In phase with current
 - None of the above
- In a series R - L circuit the $I \cos \phi$ is also known as
 - Wattful component *
 - Wattless component
 - Idle component
 - None of the above
- In a series R - L circuit, the KVA is equal to
 - $\sqrt{(KW + KVAR)}$
 - $KW + KVAR$
 - $KW^2 + KVAR^2$
 - $\sqrt{(KW^2 + KVAR^2)}$ *
- In a series R - C circuit, the current I is equal to
 - v^2/z
 - v/z *
 - z^2 / v
 - z/v
- In a series R - C circuit, the voltage v is equal to
 - $I\sqrt{(R^2 + X_C^2)}$ *
 - $I \times (R^2 + X_C^2)$
 - $I\sqrt{(R^2 + X_C^2)}$
 - $\sqrt{(R^2 - X_C^2)}$
- In a series R - L - C circuit, the impedance is equal to
 - $R^2 (X_L + X_C)^2$
 - $R^2 (X_L - X_C)^2$
 - $\sqrt{[R^2 + (X_L + X_C)^2]}$
 - $\sqrt{[R^2 + (X_L - X_C)^2]}$ *
- In a series R - L - C circuit, the power factor $\cos \phi$ is equal to
 - $[R / \sqrt{\{R^2 + (X_L - X_C)^2\}}]$ *
 - $[R / \sqrt{\{R^2 + (X_L + X_C)^2\}}]$
 - $[R / \{R^2 + (X_L - X_C)^2\}]$
 - $[R / \{R^2 + (X_L + X_C)^2\}]$
- In a series resonance circuit the current at resonant is
 - leading the applied voltage
 - lagging behind the applied voltage
 - in phase with applied voltage *
 - Both a) and b) are correct
- In a series R - L - C circuit, under resonant conditions, the power factor is equal to
 - 0
 - 1 *
 - $1 > p.f. > 0$ lag
 - $1 > p.f. > 0$ lead
- In a series resonance circuit, the L and C form part of a circuit across which
 - full voltage is developed
 - half voltage is developed

- c. no voltage is developed *
d. none of the above
18. The Q - factor in a series resonance circuit can be increased by
a. having a coil of small inductance but of large ohmic resistance
b. having a coil of large inductance but of small ohmic resistance *
c. having a coil of large inductance and ohmic resistance
d. having a coil of small inductance and ohmic resistance
19. In series resonance circuit, the ratio of the bandwidth of the circuit to its resonance frequency is known as
a. Q factor
b. sharpness of resonance *
c. admittance
d. susceptance
20. In a series resonance circuit, if bandwidth decreases, selectivity of circuit
a. increases * b. decreases
c. remain same d. none of the above
21. In a parallel R - L - C circuit, the admittance can be defined as
a. impedance
b. reciprocal of impedance *
c. resistance
d. Capacitance
22. In a parallel AC circuit, the admittance is equal to
a. $[(\text{r.m.s. volts}^2) / (\text{r.m.s. amperes})]$
b. $[(\text{r.m.s. volts}) / (\text{r.m.s. amperes})]$
c. $[(\text{r.m.s. amperes}^2) / (\text{r.m.s. volts})]$
d. $[(\text{r.m.s. amperes}) / (\text{r.m.s. volts})]$ *
23. The admittance of a parallel AC circuit having an impedance of 1 ohm is
a. 1 Mho b. 1 Henry
c. 1 Simens * d. 1 Farad
24. The power factor of a parallel AC circuit is given by
a. G/B b. G/Y *
c. G/Y^2 d. Y/G
25. A parallel AC circuit has a conductance of 0.6 S and a susceptance of 0.8 S. Its admittance is
a. 0.14 Simens b. 0.75 Simens
c. 1.0 Simens * d. 1.75 Simens
26. The equivalent series reactance of a parallel AC circuit is given by
a. $X = G/Y^2$ b. $X = G/Y$
c. $X = B/Y$ d. $X = B/Y^2$ *
27. When a parallel AC circuit is in resonance, it :
a. draws maximum current
b. offers minimum impedance
- c. is called a rejector circuit *
d. has no branch current
28. The line current drawn by a parallel AC circuit when in resonance, is
a. Wholly wattless
b. Zero
c. Much greater than circulatory branch current
d. Much less than circulatory branch current *
29. In a parallel resonance circuit, if the frequency of applied voltage increases, the capacitive susceptance will
a. increase * b. decrease
c. remain unchanged d. none of the above
30. In a parallel resonance circuit, if the frequency of applied voltage increases, the inductive susceptance will
a. increase b. decrease *
c. remain unchanged d. none of the above
31. In a parallel resonance circuit, the power factor is equal to
a. 0 b. 1 *
c. $1 > \text{p.f.} > 0$ lag d. $1 > \text{p.f.} > 0$ lag
32. The standard power supply frequency in India is
a. 25 Hz b. 50 Hz *
c. 60 Hz d. 100 Hz
33. Sinusoidal wave repeat itself after an interval of
a. 180° electrical b. 180° mechanical
c. 360° electrical * d. 360° mechanical
34. The frequency of dc supply is
a. zero * b. $16(2/3)$ Hz
c. 50 Hz d. f Hz
35. Time period of sinusoidal wave at standard frequency, in India is
a. 1 sec. b. 0.1 sec.
c. 0.2 sec d. 0.02 sec *
36. R. M. S. value of alternating current is equal to
a. $I_{\text{max}} / \sqrt{3}$ b. I_{max}
c. $2 I_{\text{max}} / \pi$ d. $I_{\text{max}} / \sqrt{2}$ *
37. R. M. S. value of current, $i = 14.14 \cos 157 t$ is
a. $14.14 \sqrt{2}$ A b. $14.14 / \sqrt{2}$ A *
c. $[(2 \times 14.14) / (3.14)]$ A d. None of the above
38. The equation of the sinusoidal emf induced in the coil which is rotating in a magnetic field is given by
a. $e = E_{\text{max}} \sin \omega t$ volts *
b. $e = 2 \times E_{\text{max}} \sin \omega t$
c. $e = E_{\text{max}} \sin \omega t \times (\pi/2)$
d. $e = 2 \times E_{\text{max}} \sin \omega t \times (\pi/2)$
39. A wave in which the value of the emf induced at any instant or time, depends upon the sine of the angle at

- that instant is known as
- saw tooth wave
 - square wave
 - sinusoidal wave *
 - none of the above
40. The value of the alternating quantity at any instant is called
- R. M. S. value
 - Average value
 - Maximum value
 - Instantaneous value *
41. The instantaneous value of current is equal to
- $I_{\max} \sin \omega t$ *
 - $2 \times I_{\max} \sin \omega t$
 - $I_{\max} \cos \omega t$
 - $2 \times I_{\max} \cos \omega t$
42. The maximum value of alternating current is
- Positive only
 - Negative only
 - Either positive or negative *
 - None of the above
43. A complete set of positive values or negative values, plotted against the time is known as
- Time period
 - Frequency
 - cycle
 - Alternation *
44. The unit of frequency is
- Hertz *
 - Ohm
 - Henry
 - Radians
45. When the angular distance travelled by a coil in one cycle is equal to 2π radians, then the angular distance travelled in f cycles is equal to
- $2\pi \times (1/f)$ radians
 - $2\pi f$ radians
 - πf radians
 - π/f radians *
46. An alternating voltage is given by the expression, $e = 200 \sin 314 t$. The maximum voltage will be
- 100V
 - 200 V *
 - 50V
 - 250V
47. An alternating voltage is given by the expression $e = 200 \sin 314 t$. The frequency of that voltage will be
- 25 Hz
 - 30 Hz
 - 50 Hz *
 - 250 Hz
48. The average value of an alternating current is equal to
- $[(2 I_{\max}) / \pi]$ *
 - I_{\max}
 - $[I_{\max} / (\pi)]$
 - $[(4 I_{\max}) / \pi]$
49. The average value of rectified half wave current is equal to
- $[(2 I_{\max}) / (\pi)]$
 - $[(I_{\max}) / (2)]$
 - $[(I_{\max}) / (\pi)]$ *
 - $[(\pi I_{\max}) / (2)]$
50. R. M. S. value of the half wave rectified current is equal to
- $0.2 I_{\max}$
 - $0.4 I_{\max}$
 - $0.5 I_{\max}$ *
 - $0.8 I_{\max}$
51. The value of form factor for sinusoidal wave is equal to
- 0.11
 - 1.11 *
 - 2.11
 - 3.11
52. The value of peak factor for sinusoidal wave is equal to
- 1.14
 - 1.214
 - 1.314
 - 1.414 *
53. Vectors are a short - hand for the representation of alternating voltage and current, and are graphically represent by straight line. The length of the line represents the
- magnitude of alternating quantity *
 - direction of quantity
 - direction in which that quantity act
 - none of the above
54. A quantity having direction and magnitude and are changing with time in cyclic order is known as
- scalar quantity
 - vector quantity
 - phasor quantity *
 - none of the above
55. A diagram showing the phase relation between current and voltage of any ac circuit is known as
- Current diagram
 - Voltage diagram
 - Power diagram
 - Phasor diagram *
56. In phase current expression of an ac circuit will be
- $i = I_{\max} \sin \omega t$ *
 - $i = I_{\max} \sin (\omega t - \phi)$
 - $i = I_{\max} \sin (\omega t + \phi)$
 - None of the above
57. Lagging current expression of an ac circuit will be
- $i = I_{\max} \sin \omega t$
 - $i = I_{\max} \sin (\omega t - f)$ *
 - $i = I_{\max} \sin (\omega t + f)$
 - None of the above
58. If a circuit consists of a pure resistance of 50Ω , and is connected across ac supply $v = 250 \sin 314t$, then the current in the resistance will be
- 2.5 A
 - 3.54 A *
 - 4.2 A
 - 4.5 A
59. If a circuit consists of a pure resistance of 50Ω and is connected across ac supply $V = 250 \sin 314 t$, then the power consumed by resistance will be
- 400 W
 - 426 W
 - 600 W
 - 626 W *
60. The instantaneous power in pure inductive circuit is equal to
- $VI \sin \theta$
 - $VI \sin 2 \theta$ *
 - $VI \cos \theta$
 - $VI \cos 2 \theta$
61. The instantaneous power in pure capacitive circuit is equal to
- $VI \sin \theta$
 - $VI \sin 2 \theta$ *
 - $VI \cos \theta$
 - $VI \cos 2 \theta$
62. If a circuit offers 31.4 Ohms inductive reactance at 50 Hz and the resistance is negligible then the induction

- of circuit will be
- 1 henry
 - 0.1 henry *
 - 0.01 henry
 - 0.001 henry
63. If a circuit; offer 31.4 ohms inductive reactance at 50 Hz and the resistance is negligible then how much current does the circuit draw if its terminals are connected to 230 V, 25 Hz supply
- 12.5 A
 - 13.6 A
 - 14.65 A *
 - 18.5 A
64. If a pure capacitive circuit offers 31.4 ohms capacitive reactance at 25 Hz then how much current does the circuit draw if its terminals are connected to 230 V, 50 Hz supply
- 10.5 A
 - 12.6 A
 - 13.84 A
 - 14.65 A *
65. The main application of resonance is in RF circuit for
- tuning to an ac signal of desired frequency *
 - tuning to an ac voltage
 - tuning to an alternating current
 - none of the above
66. Tuning by means of the resonant effect provides the practical application of
- resistivity
 - conductivity
 - selectivity *
 - none of the above
67. Resonance of any L - C circuit is depends upon
- voltage
 - current
 - resistance
 - frequency *
68. The resonant frequency is equal to
- $2\pi\sqrt{LC}$
 - $1/2\pi\sqrt{LC}$ *
 - $2\pi/\sqrt{LC}$
 - $4\pi\sqrt{LC}$
69. In tuning the LC circuit provides maximum voltage output at
- resonant frequency *
 - above resonant frequency
 - below resonant frequency
 - none of the above
70. Below the resonant frequency, the amount of current is limited, because of
- small X_L and high X_C *
 - high X_L and small X_C
 - high X_L and high X_C
 - small X_L and small X_C
71. Above the resonant frequency, the amount of current is limited, because of
- small X_L and high X_C
 - high X_L and small X_C *
 - high X_L and high X_C
 - small X_L and small X_C
72. At the resonant frequency, maximum current is allowed because of
- small X_L and high X_C
 - high X_L and small X_C
 - equal X_L and X_C *
 - none of the above
73. The impedance of series resonance circuit is minimum at resonant because of
- reactance high
 - reactance low
 - reactance medium
 - reactance cancel *
74. The minimum impedance at resonance of a series resonance circuit is
- resistive *
 - inductive
 - capacitive
 - none of the above
75. The maximum current in a series resonance circuit is useful because at resonant frequency it produces maximum voltage across
- X_L only
 - X_C only
 - either X_L or X_C *
 - None of the above
76. In a series resonant circuit, in order to use the resonant rise of voltage, the output must be connected across :
- capacitor only
 - inductor only
 - capacitor and inductor
 - either a) or b) *
77. In a parallel resonance circuit, as the frequency is increased toward resonance, the capacitive branch current
- increases *
 - decreases
 - remain same
 - none of the above
78. In a parallel resonance circuit, as the frequency is increased toward resonance, the inductive branch current
- increases
 - decreases *
 - remain same
 - none of the above
79. In a parallel resonance circuit, above the resonant frequency, the current in the capacitive branch in compare with inductive branch is
- more *
 - less
 - equal
 - either a) or b)
80. An impedance that has a high value for just one frequency but a low impedance for other frequencies, either below or above resonance, can be obtained by using a
- Series resonance circuit
 - Parallel resonance circuit *
 - Both a) and b) are correct
 - None of the above
81. If the values of L and C in a resonance circuit is made low, then the resonant frequency of that circuit will be
- low
 - high *
 - of no change
 - both a) and b)
82. If resonance frequency is 6 MHz with particular values of L and C, then to make resonance frequency 12 MHz we have to
- use one fourth the L with same C
 - Use one fourth the C with same L

- c. Reduce both L and C by one half
d. All of the above are correct *
83. If resonant frequency is 6 MHz with particular values of L and C, and if either L or C is made four time larger, then the value of resonant frequency will be
a. 2 MHz b. 3 MHz *
c. 12 MHz d. 24 MHz
84. In a resonance circuit the value of C is equal to
a. $[1 / (4\pi^2 f_r^2 L)]$ * b. $(4\pi^2 f_r^2 L)$
c. $[1 / (4\pi^2 f_r^2 L)]$ d. $(2\pi^2 f_r^2 L)$
85. In a resonance circuit the value of L is equal to
a. $[1 / (2\pi^2 f_r^2 C)]$ b. $(4\pi^2 f_r^2 C)$
c. $[1 / (4\pi^2 f_r^2 C)]$ * d. $(2\pi^2 f_r^2 C)$
86. If series resonant circuit develops 100 mV across a 250 μ H inductance with a 2 mV input, then the Q will be
a. 200 b. 500
c. 5 d. 50 *
87. Any resonant frequency that provide resonant effects has an associated band of
a. Current b. Voltage
c. Frequency * d. Impedance
88. The inductance of a coil can be increased by
a. decreasing number of turns
b. increasing core length
c. using core material of high relative permeability*
d. all of the above
e. none of the above
89. The resistance of a lamp rated at 240 V and 60 watts is equal to
a. 60 ohms b. 120 ohms
c. 240 ohms* d. 480 ohms
e. 30 ohms
90. Two resistances of 100 ohms and zero ohm are connected in parallel. The overall resistance will be
a. 100 ohms b. 50 ohms
c. zero ohm* d. any one of the above
e. none of the above
91. A parallel a.c. circuit in resonance will
a. have high impedance*
b. generate maximum noise
c. generate maximum heat
d. generate maximum power
e. have pure resistance
92. Two resistors of 2 k ohm value each and 1 watt rating are connected in series. The net resistance and wattage value will be
a. 4 k-ohm, 2 watt* b. 1 k-ohm, $\frac{1}{2}$ watt
c. 4 k-ohm, 1 watt d. 2 k-ohm, 2 watt
- e. 2 k-ohm, $\frac{1}{2}$ watt
93. Sheath is used in the cables to
a. prevent the moisture from entering the cable*
b. provide the strength to the cable
c. avoid the chances of the rust on the strands
d. provide proper insulation
e. reduce noise pick up
94. The voltage stress is maximum in the cable
a. at the surface of the sheath
b. at the surface of the conductor
c. at the surface of the insulator*
d. at the surface of the armour
e. at the surface of the conductor
95. Which of the following parameter will be more for 16 gauge copper wire in comparison to 14 gauge copper wire
a. cost b. strength
c. resistance* d. weight
e. all of the above
96. The length of wire having resistance of 1 ohm/m in a heater rated at 1000 W and 250 V will be
a. 250 m b. 125 m
c. 62.5 m* d. 500 m
e. 1000m
97. Power dissipated in a pure capacitor is
a. minimum b. maximum
c. infinite d. zero*
e. dependent on voltage applied
98. The size of the feeder is determined primarily by
a. the current it is required to carry*
b. the percentage variation of voltage in the feeder
c. the distance over which the transmission is made
d. the distance over which the transmission is made
e. the power rating
99. Non-conductors whose polarisation is caused by an electric field are known as
a. dielectric`* b. super conductors
c. semi conductors d. insulators
e. semi insulators
100. If the diameter of a conductor is doubled, then its resistance will be reduced to
a. half b. one-fourth*
c. one-eight d. one-sixteenth
e. $\frac{1}{\sqrt{2}}$ times
101. One of the difficulties encountered with super conductors is
a. that materials become highly magnetic
b. strength is reduced

- c. resistance is increased
 d. maintenance of low temperature*
 e. hydrogen embrittlement
102. A coil having an inductance of 100 mH is carrying a current of 100 A. If the current is reduced to zero in 0.02 sec. the self induced e.m.f. will be
 a. 125 V* b. 250 V
 c. 375 V d. 500 V
 e. 750 V
103. Which of the following is the poorest conductor of electricity
 a. silver b. copper
 c. aluminium d. carbon*
 e. steel
104. A 50 turn coil is linked with a magnetic flux of intensity 0.0004 webers. If the direction of this flux is reversed in 0.01 sec, then the e.m.f. induced in the coil will be
 a. 1 V b. 2 V
 c. 4 V* d. 9 V
 e. 1/4 V
105. If the potential difference across a parallel plate air capacitor is increased, the electric field intensity between the plates will increase
 a. in same proportion
 b. double the proportion*
 c. as square of the change
 d. as square root of the change
 e. first rapidly and then slowly
106. The power factor at resonance in R-L-C parallel circuit is
 a. 0.5 lagging b. 0.5 leading
 c. unity* d. zero
 e. many have any value
107. A 10 cm long conductor is linked with a magnetic field of 1 weber/sq. m. When a current of 10 A passes through it, it will experience a force of
 a. 0.01 N b. 0.1 N
 c. 1 N * d. 10 N
 e. 100 N
108. The energy requirement for an industrial application is 1000 kWhr. If heat losses account for 20%, the total energy to be supplied is
 a. 1200 kWhr b. 800 kWhr
 c. 1250 kWhr* d. 750 kWhr
 e. 1225 kWhr
109. The cells are connected in series to
 a. increase the current output
 b. increase the voltage output*
 c. decrease the internal resistance
 d. decrease the amount of charging voltage required
 e. increase the power rating
110. A floating battery is one
 a. which is getting charged
 b. which is feeding load
 c. in which battery voltage is equal to charger voltage*
 d. which gets charged and discharged simultaneously
 e. which normally feeds the load and gets charged when it is idle
111. The sparking at the brushes in the d.c. generator is attributed to
 a. quick reversal of current in the coil under commutation
 b. armature reaction
 c. reactance voltage*
 d. high resistance of the brushes
 e. inefficient operation of the motor
112. The transformer is not used in the d.c. line because
 a. there is no need to step up the d.c. voltage
 b. losses in the d.c. circuit are high
 c. Faraday's law is not valid as the rate of change of flux is zero*
 d. harmonics developed in the transformer will cause distortion in the voltage
 e. D.C. transformers are costly
113. The purpose of laminating the transformer core is
 a. difficult of fabricating solid core
 b. laminated core provides high flux density
 c. avoid eddy current and hysteresis losses*
 d. increase the main flux
 e. reduce transformer cost
114. The mechanical power developed by the d.c. motor is maximum when back e.m.f. is equal to
 a. applied voltage
 b. zero
 c. half the applied voltage*
 d. twice the applied voltage
 e. one-fourth the applied voltage
115. A series motor at no load develops
 a. zero speed b. average speed
 c. rated speed d. infinite speed*
 e. none of the above
116. In the case of d.c. shunt motor, the torque with increase in speed will
 a. increase linearly b. decrease linearly
 c. increase parabolically d. decrease parabolically
 e. remain unchanged*
117. If the supply terminals of d.c. shunt motor are interchanged, then
 a. motor will stop
 b. motor will run at its normal speed in the same direction as it was running
 c. the direction of rotation will reverse*
 d. motor speed will increase
 e. motor will burn
118. In the case of d.c. shunt generator, as the load current increase, the terminal voltage

- a. decrease gradually slightly from a maximum value*
 b. increases linearly from zero
 c. decreases linearly from maximum to zero
 d. remain constant
 e. first increases and then decreases
119. If a.c. is fed by mistake to a d.c. motor then the d.c. motor will
 a. burn as the eddy currents in the field produce heat*
 b. run at its normal speed
 c. run at a lower speed
 d. run continuously but the sparking takes place at the brushes
 e. efficiency will be very poor
120. The following motor is preferred for the locomotives motor drives
 a. a.c. series motor b. induction motor
 c. d.c. series motor * d. synchronous motor
 e. single phase motor
121. Which of the following motors has high starting torque ?
 a. d.c. shunt motor
 b. squirrel cage induction motor
 c. d.c. series motor*
 d. a.c. series motor
 e. single phase motor
122. In a d.c. generator, following loss will be minimum
 a. copper loss b. iron loss*
 c. friction loss d. shunt field copper loss
 e. windage loss
123. If the excitation to the field of the d.c. motor is constant then the torque developed in the motor is proportional to
 a. armature current* b. field current
 c. speed d. magnetic flux
 e. induced e.m.f.
124. Eddy current loss in a d.c. shunt generator is proportional to
 a. flux density b. $\sqrt{\text{flux density}}$
 c. $1/\text{flux density}$ d. $(\text{flux density})^{2*}$
 e. $\frac{1}{\sqrt{\text{flux density}}}$
125. The torque of a d.c. series motor with increase in speed
 a. increases gradually
 b. decreases linearly
 c. remains constant
 d. first decreases rapidly and then slowly*
 e. first decreases slowly and then rapidly
126. The function of the commutator in a d.c. machine is
 a. to change alternating current to a direct current
 b. to improve commutation
 c. to improve efficiency of motor
 d. to change alternating voltage to direct voltage*
 e. to change direct voltage to alternating voltage
127. The torque in induction motor is proportional to
 a. slip * b. $1/s$
 c. s^2 d. $1 - s$
 e. $\frac{1 - s}{s}$
128. Which of the following motors is usually used in household refrigerator ?
 a. d.c. shunt motor
 b. reluctance motor
 c. single phase induction motor (split phase start or induction run motor)*
 d. synchronous motor
 e. 3-phase induction motor
129. The maximum temperature permitted for Class A insulation is
 a. 180°C b. 105°C^*
 c. 120°C d. 155°C
 e. 95°C
130. The torque in the case of a wound rotor induction motor
 a. increases as rotor resistance is increased*
 b. decreases as rotor resistance is increased
 c. remains unaffected by increase/decrease of rotor is shorted
 d. is maximum when rotor is shorted
 e. is inversely proportional to speed
131. For hoists and cranes, which motor should be selected
 a. 3 phase induction motor
 b. synchronous motor
 c. d.c. series motor*
 d. d.c. shunt motor
 e. compound motor
132. The power output of induction motor will be maximum when
 a. the equivalent load resistance is equal to the standstill reactance of the motor
 b. the equivalent load resistance is equal to the resistance of the rotor
 c. the equivalent resistance is equal to the standstill leakage impedance of the motor*
 d. the slip is zero
 e. the slip is 5%
133. The speed of an induction motor is
 a. synchronous speed
 b. synchronous speed \times slip
 c. $\frac{\text{synchronous speed}}{(1 - \text{slip})}$
 d. synchronous speed $(1 - \text{slip})^*$
 e. synchronous speed $\left(\frac{1 - \text{slip}}{1 + \text{slip}}\right)$

134. Which of the following motors has high starting torque
- a.c. motor
 - induction motor
 - synchronous motor
 - d.c. shunt motor
 - d.c. series motor*
135. The starting torque of the slip ring induction motor is increased by
- adding external resistance to the rotor*
 - adding the external inductance to the rotor
 - adding both external resistance and inductance to the rotor
 - adding external capacitance to the rotor
 - increasing the voltage fed to motor
136. An under excited synchronous motor draws current at
- unity power factor (p.f.)
 - leading p.f.
 - lagging p.f.*
 - leading/lagging depending on underload/overload
 - variable p.f. depending on speed
137. The torque developed by an induction motor corresponding to zero slip is equal to
- maximum
 - full rated capacity
 - zero*
 - minimum
 - half the rated capacity
138. Which of the following motors is most frequently used in industries
- synchronous motor
 - commutator motor
 - single phase a.c. motor
 - 3 phase induction motor*
 - series wound d.c. motor
139. An induction motor is
- self-starting with zero torque
 - self-starting with high torque
 - self-starting with small torque than rated torque*
 - self-starting with infinite torque
 - not self-starting
140. Full load current of a 10 HP, 3 phase, 440 V induction motor is of the order of
- 7 A
 - 14 A*
 - 21 A
 - 28 A
 - 35 A
141. The starting current by a delta connected induction motor as compared to star connected motor under all other identical conditions is
- same
 - 2 times
 - 3 times*
 - 1/2 times
 - 1/3 times
142. The rotor slots are usually given slight skew in the squirrel case induction motor
- to increase the tensile strength of the rotor bars and hence strength
 - to reduce the magnetic hum and locking tendency of the rotor*
 - to save the copper used
 - because of ease in fabrication
 - to reduce the electrical and mechanical losses
143. The class C insulation can withstand
- 180°C*
 - 150°C
 - 200°C
 - 105°C
 - 95°C
144. The untreated paper falls in the following class of insulation
- A
 - B
 - E
 - H
 - O*
145. Mica tape falls under the following class of insulation
- A
 - B*
 - E
 - H
 - O
146. The material used for fuse must have
- low melting point and low specific resistance
 - low melting point and high specific resistance*
 - high melting point and low specific resistance
 - low melting point with any specific resistance
 - none of the above
147. The Buchholz relay is used to protect the
- alternators against all internal faults
 - oil immersed transformers against all internal faults*
 - synchronous motor against all internal faults
 - transmission lines against all short circuit faults
 - motors
148. The earthing transformer is used
- to avoid the harmonics in the transformer
 - to provide artificial neutral earthing where the neutral points of the three phase system are not accessible*
 - to improve the current capacity of the neutral wire
 - improved efficiency
 - never used
149. The voltage regulation of a transformer is poor at
- unity power factor
 - zero power factor
 - leading power factor
 - lagging power factor*
 - fluctuating power factor
150. The copper losses in a transformer at half load compared to those at full load will be
- same
 - half
 - one-fourth*
 - 2 times
 - 4 times
151. It is essential that transformer oil should have no traces of moisture. The reason is that
- density of oil increases which reduces heat dissipation
 - moisture will reduce the dielectric strength of the

- oil and hence insulation is weakened*
- c. moisture will reduce the lubricating property of the oil
- d. moisture will developed rust
- e. moisture can lead to flash over
152. Which of the following electrical machines has the highest efficiency ?
- a. d.c. shunt motor b. transformer*
- c. induction motor d. synchronous motor
- e. invertor
153. The condition for the maximum efficiency of the transformer is that
- a. copper losses are half of the iron losses
- b. copper losses are equal to iron losses*
- c. copper losses are negligible in comparison to iron losses
- d. iron losses are zero
- e. copper losses are double the iron losses
154. The operation of the electric generator and motor is based on the integration between
- a. magnetic field and electric field
- b. magnetic field and electric current*
- c. electric field and law of induction
- d. law of induction and dynamo-electric principle
- e. electric voltage and magnetic field
155. Which of the following transformer will have smallest size with same electrical specifications ?
- a. Oil Natural Air Natural (ONAN) cooled transformer
- b. Dry type transformer
- c. Oil Natural Air Forced (ONAF) cooled transformer
- d. Oil Forced Water Forced (OFWF) cooled transformer*
- e. Forced air cooled
156. Which parameter is increased by step up transformer
- a. current b. resistance
- c. voltage* d. frequency
- e. power
157. Open circuit test on transformer measured
- a. impedance and insulation resistance
- b. voltage regulation c. eddy current loss
- d. copper loss e. core loss*
158. In a step up transformer, which of the following is correct
- a. secondary power is more than primary
- b. secondary current is more than primary
- c. secondary turns are more than primary*
- d. phase shift between secondary and primary is 180°
- e. all of the above
159. The efficiency of a transformer is usually of the order of
- a. 33% b. 50%
- c. 75% d. 82%
- e. 98%*
160. The dielectric strength of transformer oil should be of the order of
- a. 415 V b. 6.6 V
- c. 11 kV d. 30 kV*
- e. 110 kV
161. If the secondary winding of the current transformer is opened when current is flowing in the primary current, then following will result
- a. there will be high current in the secondary winding
- b. there will be very high induced voltage in the secondary winding*
- c. there will be very weak flux density in the core
- d. the transformer will burn immediately
- e. nothing will happen
162. It is possible to extend the range of an a.c. ammeter by using
- a. current transformer (CT) *
- b. shunt
- c. capacitor
- d. inductor coil
- e. capacitor-resistor network
163. Which of the following voltmeters would be selected for most accurate readings ?
- a. 100 V, 1 A
- b. 100 V, 100 ohms/volt
- c. 100 V, 1 mA*
- d. 100 V, 100 mA
- e. 100 V, 10 mA
164. Which of the following instrument will be used to measure alternating current ?
- a. moving iron voltmeter
- b. permanent magnet type ammeter
- c. induction type ammeter
- d. moving iron (attraction type) ammeter*
- e. moving coil instrument
165. The internal impedance of an accurate voltmeter should be
- a. as low as possible b. low
- c. very low d. negligible
- e. very high*
166. A moving coil instrument can be used to measure
- a. low frequency alternating current
- b. high frequency alternating current
- c. direct current*
- d. direct current and alternating current both
- e. electrical power
167. Which of the following statement is true ?
- a. A galvanometer with low resistance in series is an ammeter*
- b. A galvanometer with high resistance in series is an ammeter
- c. A galvanometer with high resistance in parallel is a voltmeter
- d. A galvanometer with low resistance in parallel is a voltmeter
- e. all of the above

168. High current of the order of 100 A can be measured by an ammeter of 0-1 A rating by using
- shunt
 - capacitor
 - R-C network
 - current transformer*
 - induction coil
169. The insulation resistance of cables, transformers, etc. is measured by following instrument
- wheatstone bridge
 - kelvin bridge
 - meggarr*
 - decade box
 - voltmeter and ammeter
170. A watt meter can be connected to a high current circuit by using
- eddy current transformer
 - potential transformer
 - current transformer*
 - shunt
 - inductor
171. The Wheatstone bridge is used to measure
- low value of current
 - high value of current
 - high value of voltage
 - low value of voltage
 - resistance value*
172. The internal resistance of the milliammeter must be very low for
- high sensitivity
 - high accuracy
 - maximum voltage drop across the meter
 - minimum effect on the current in the circuit*
 - safety of milliammeter
173. The internal resistance of the voltmeter must be very high in order to have
- high voltage range
 - minimum current through the meter
 - maximum loading effect
 - more current supplied by the voltage source*
 - safety of the instrument
174. Friction losses are more in the following type of instrument
- dynamometer type*
 - moving coil type
 - moving iron type
 - null balance type
 - moving magnet type.
175. A d.c. voltmeter can be directly used to measure
- power factor*
 - insulation resistance
 - frequency
 - polarity
 - all of the above
176. Large currents in d.c. circuits can be measured with
- current transformer and voltmeter
 - potential transformer and milli voltmeter
 - shunt and milli voltmeter*
 - R-C network and voltmeter
 - micro ammeter
177. Which of the following indicators is suitable only for direct current
- permanent magnet*
 - electro-dynamic
 - moving iron
 - hot wire
 - all of the above
178. The scale of moving coil meter is
- linear*
 - non-linear
 - logarithmic
 - uniform initially and then cramped
 - exponential
179. Bolometer is used in measurement of
- microwave power*
 - microwave current
 - R.F. power
 - audio power
 - all of the above.
180. The working voltage of a capacitor in an AC circuit should be
- At least 50 percent greater than the highest applied voltage*
 - Equal to the highest applied voltage
 - At least 20 percent greater than the highest applied voltage
181. The term that describes the combined resistive forces in an AC circuit is
- Impedance*
 - Reactance
 - Resistance
182. The basis for transformer operation in the use of alternating current is mutual
- Reactance
 - Capacitance
 - Inductance*
183. The opposition offered by a coil to the flow of alternating current is called (disregard resistance)
- Impedance
 - Inductive reactance*
 - Reluctance
184. An increase in which of the following factors will cause an increase in the inductive reactance of a circuit
- Resistance and voltage
 - Inductance and frequency*
 - Resistance and capacitive reactance
185. In an AC circuit, the effective voltage is
- Less than the maximum instantaneous voltage*
 - Greater than the maximum instantaneous voltage
 - Equal to the maximum instantaneous voltage
186. The amount of electricity a capacitor can store is directly proportional to the
- Plate area and is not affected by the distance between the plates
 - Distance between the plates and inversely proportional to the plate area
 - Plate area and inversely proportional to the distance between the plates*
187. Unless otherwise specified, any values given for current or voltage in an AC circuit are assumed to be
- Effective values*
 - Instantaneous values
 - Maximum values

188. When inductors are connected in series in a circuit, the total inductance is (where the magnetic fields of each inductor do not affect the others)
- Equal to the inductance of the highest rated inductor
 - Less than the inductance of the lowest rated inductor
 - Equal to the sum of the individual inductances*
189. Which requires the most electrical power during operation
Note : 1 horsepower = 746 watts
- A 12 volt motor requiring 8 amperes
 - Four 30 watt lamps in a 12 volt parallel circuit
 - Two lights requiring 3 amperes each in a 24 volt parallel system*
190. How many amperes will a 28 volt generator be required to supply to a circuit containing five lamps in parallel, three of which have a resistance of 6 ohms each and two of which have a resistance of 5 ohms each
- 1.11 amperes
 - 1 ampere
 - 25.23 amperes*
191. The potential difference between two conductors which are insulated from each other is measured in
- Coulombs
 - Amperes
 - Volts*
192. A 24 volt source is required to furnish 48 watts to a parallel circuit consisting of four resistors of equal value. What is the voltage drop across each resistor
- 6 volts
 - 12 volts
 - 24 volts*
193. When calculating power in a reactive or inductive AC circuit, the true power is
- Less than the apparent power in a reactive circuit and more than the apparent power in an inductive circuit
 - Less than the apparent power*
 - More than the apparent power
194. The correct way to connect a test voltmeter in a circuit is
- In series with a unit
 - In parallel with a unit*
 - Between the source voltage and the load
195. Which term means .001 ampere
- Microamperes
 - Milliampere*
 - Kiloamperes
196. A cabin entry light of 10 watts and a dome light of 20 watts are connected in parallel to a 30 volt source. If the voltage across the 10 watt light is measured, it will be
- Equal to the voltage across the 20 watt light*
 - Half the voltage across the 20 watt light
 - One third of the input voltage
197. A 14 ohm resistor is to be installed in a series circuit carrying .05 ampere. How much power will the resistor be required to dissipate
- At least .70 milliwatt
 - At least 35 milliwatts*
 - Less than .035 watt
198. .002KV equals
- .2 volt
 - 20 volts
 - 2.0 volts*
199. A 24 volt source is required to furnish 48 watts to a parallel circuit consisting of two resistors of equal value. What is the value of each resistor ?
Note : $R_t = E^2 / P$
- 6 ohms
 - 24 ohms*
 - 12 ohms
200. Which requires the most electrical power ?
- A 1/5 horsepower, 24 volt motor which is 75 percent efficient*
 - A 24 volt anticollision light circuit consisting of two light assemblies which require 3 amperes each during operation
 - Four 30 watt lamps arranged in a 12 volt parallel circuit
201. What unit is used to express electrical power
- Watt*
 - Ampere
 - Volt
202. What is the operating resistance of a 30 watt light bulb designed for a 28 volt system
- 1.07 ohms
 - 26 ohms*
 - 0.93 ohm
203. Which statement is correct when made in reference to a parallel circuit ?
- The current is equal in all portions of the circuit
 - The current in amperes can be found by dividing the EMF in volts by the sum of the resistors in ohms
 - The total current is equal to the sum of the currents through the individual branches of the circuit*
204. Diodes are used in electrical power supply circuits primarily as
- Switches
 - Rectifiers*
 - Relays
205. Transfer of electrical energy from one conductor to another without the aid of electrical connections
- Will cause excessive arcing and heat, and as a result is impractical
 - Is called air gap transfer
 - Is called induction*
206. If three resistors of 3 ohms, 5 ohms, and 22 ohms are connected in series in a 28 volt circuit, how much current will flow through the 3 ohm resistor ?
- 9.3 amperes
 - 1.05 amperes*
 - 0.93 ampere

207. A circuit has an applied voltage of 30 volts and a load consisting of a 10 ohm resistor in series with a 20 ohm resistor, What is the voltage drop across the 10 ohm resistor
- 10 volts*
 - 20 volts
 - 30 volts
208. Which is correct in reference to electrical resistance
- If one of three bulbs in a parallel lighting circuit is removed, the total resistance of the circuit will become greater.*
 - An electrical device that has a high resistance will use more power than one with a low resistance with the same applied voltage
 - Two electrical devices will have the same combined resistance if they are connected in series as they will have if connected in parallel
209. What happens to the current in a voltage step up transformer with a ratio of 1 to 4
- The current is stepped up by a 1 to 4 ratio
 - The current does not change
 - The current is stepped down by a 1 to 4 ratio*
210. Which of these will cause the resistance of a conductor to decrease
- Decrease the length or the cross sectional area
 - Decrease the length or increase the cross sectional area*
 - Increase the length decrease the cross sectional area
211. Through which material will magnetic lines of force pass the most readily
- Aluminum
 - Iron*
 - Copper
212. A 48 volt source is required to furnish 192 watts to a parallel circuit consisting of three resistors of equal value. What is the value of each resistor
- 36 ohms*
 - 4 ohms
 - 12 ohms
213. Which is correct concerning a parallel circuit
- Total resistance will decrease when one of the resistances is removed
 - Total voltage drop is the same as the total resistance
 - Total resistance will be smaller than the smallest resistor*
214. The voltage drop in a circuit of known resistance is dependent on
- Only the resistance of the conductor, and does not change with a change in either voltage or amperage
 - The amperage of the circuit*
 - The voltage of the circuit
215. A thermal switch, as used in an electric motor, is designed to
- Open the circuit in order to allow cooling of the motor*
 - Close the integral fan circuit to allow cooling of the motor
 - Reroute the circuit to ground
216. When referring to an electrical circuit diagram, what point is considered to be at zero voltage
- The circuit breaker
 - The switch
 - The ground reference*
217. In a P-N-P transistor application, the solid state device is turned on when the
- Base is positive with respect to the emitter
 - Base is negative with respect to the emitter*
 - Emitter is negative with respect to the base
218. In an N-P-N transistor application, the solid state device is turned on when the
- Base is negative with respect to the emitter
 - Base is positive with respect to the emitter*
 - Emitter is positive with respect to the base
219. Typical application for zener diodes is as
- Full-wave rectifiers
 - Half-wave rectifiers
 - Voltage regulators*
220. Forward biasing of a solid state device will cause the device to
- Conduct*
 - Conduct via zener breakdown
 - Turn off
- Fill in the blanks**
- In an AC circuit the true power in watts is given by _____. ($v \times A$, $v^2 \times A$, $v \times A \times \cos\theta$)
 - In an AC circuit cosine of the angle of lead or lag is known as _____. (admittance, susceptance, **power factor**)
 - In a series R-L circuit the ratio of resistance and impedance (R/Z) is known as _____. (true power, apparent power, **power factor**)
 - In a series R-L circuit, the power factor may be defined as the ratio of _____. (VA/W , V^2A/W , W/VA)
 - In a series R-L circuit by 'wattful component' we mean _____ component. (**active**, reactive)
 - In a series R-L circuit, the $I \sin\phi$ is also known as _____ component. (wattful, **wattless**)
 - In a series R-L circuit the active component of current is obtained by multiplying KVA by _____. ($\cos\theta$, $\sin\theta$, $\tan\theta$)
 - In a series R-L circuit, the reactive component of current is obtained by multiplying KVA by _____. ($\cos\theta$, **$\sin\theta$** , $\tan\theta$)
 - In a R-L circuit, the power in KW is given by _____.

- ($KVA \sin\theta$, $KVA \cos\theta$, $\sqrt{KW^2 + KVAR^2}$)
10. In a series R-L circuit current always _____ the applied voltage. (leads, inphase, **lags behind**)
 11. In a series R.C. circuit, current always _____ the applied voltage. (inphase, **leads**, lags behind)
 12. In a series AC circuit is said to be in electrical resonance when its net reactance is _____. (one, more than one, **zero**)
 13. A series resonance circuit at resonance behaves like a pure _____ circuit. (inductive, capacitive, **resistive**)
 14. In a series resonance circuit at resonance the line current is _____. (**maximum**, minimum)
 15. Series resonance is often referred to as _____. (current resonance, **voltage resonance**)
 16. In case of a series resonance higher factor means a _____ selectivity of tuning coil. (**higher**, medium, lower)
 17. The unit of admittance is _____. (ohm, farad, **siemens**)
 18. A parallel L.C.R. circuit is said to be in electrical resonance when the _____ component of line current becomes zero. (active, **reactive**, both active & reactive)
 19. In a parallel resonance circuit the impedance is _____. (**maximum**, minimum, half of its normal value).
 20. Like impedance, admittance also has _____ rectangular components. (**two**, three, four)
 21. In a series resonance circuit the Q factor gives the _____ magnification. (**voltage**, current, resistance)
 22. In a parallel resonance circuit, the Q factor gives the _____ magnification. (voltage, **current**, resistance)
 23. In a parallel resonance circuit the line current is _____. (maximum, **minimum**, double of its normal value)
 24. The shape of the curve obtained by plotting the instantaneous values of voltage or current as ordinate against time as abscissa is called its _____. (time period, frequency, **wave form**)
 25. The most important wave shape of an AC in practice is _____. (saw tooth, square, **sinusoidal**)
 26. The rms value of the current $i = 28.28 \sin 314 t$ is _____ A. (6, **20**, 18)
 27. The effective value of the current $20 \sqrt{2} \cos 314 t$ is _____ A. (6, **20**, 18)
 28. The equation of the current in the circuit is given by, $i = 200 \sin (314 t - 30^\circ)$, if the value of $314 t = 60^\circ$, then the value of the instantaneous current will be _____ A. (50, **100**, 200)
 29. In purely inductive circuit current lags the voltage by an angle of _____. (**90°**, 120°, 360°)
 30. In purely inductive circuit the voltage _____ the current by 90°. (lags, **leads**, inphase)
 31. Average power dissipated in a pure inductor is _____. (100W, 200W, **zero**)
 32. In purely capacity circuit voltage lags the current by an angle of _____. (**90°**, 120°, 360°)
 33. For a pure capacitor if voltage phasor is represented along positive x-axis, then the current phasor will be along _____ Y axis. (negative, **positive**, neutral)
 34. The average power dissipated in a pure capacitor is _____. (100 watt, 200 watt, **zero**)
 35. Apparent power in AC circuit is _____. (V/I , $V \times I$, $V \times I \times \cos\theta$)
 36. A 100 W, 230 v dc lamp will consume _____ power when connected to 230 v ac supply. (more, less, **same**)
 37. The power factor will be leading for _____ load. (inductive, **capacitive**, resistive)
 38. The power factor will be lagging for _____ load. (**inductive**, capacitive, resistive)
 39. The term $\cos\theta$ in power equation is known as _____ of the circuit. (form factor, amplitude factor, **power factor**)
 40. Low power factor causes _____ in the terminal voltage. (greater rise, **greater fall**, no change)
 41. To obtain certain power with low power factor the current has to be _____. (decreased, **increased**, unchanged)
 42. To obtain a certain power with low power factor, the current has to be increased, which causes the _____ of resistive losses. (**increase**, decrease, no change)
 43. For a given KVA if the power factor of the load increases, its reactive power will go on _____. (increasing, **decreasing**, no change)
 44. The effective value of alternating current produces _____ effects as produced by the direct current. (**same**, different, no change)
 45. Vectors are a short-hand for the representation of the _____ voltages and current. (direct, **alternating**)
 46. Vector quantities are graphically represented by _____ lines called vector. (curve, broken, **straight**)

47. The alternating voltages and currents represented by vectors rotating _____. (clockwise, **counter clockwise**)
48. There are three possible phase relations between _____ phaser quantity. (**two**, three, four)
49. Tuning in radio and television receivers, transmitters and electronics equipment in general are application of _____. (impedance, amplitude, **resonance**)
50. The resonant circuit can select a particular _____ for the output with many different frequencies at the input. (**frequency**,)
51. The phenomenon of equal and opposite reactance is called _____. (impedance, admittance, **resonance**)
52. The frequency at which the opposite reactance are equal is called _____. (opposite frequency, fractional frequency, **resonant frequency**)
53. Large values of L and C provide a relatively _____ resonant frequency. (**low**, high, medium)
54. Smaller values of L and C provide a relatively _____ resonant frequency. (low, **high**, medium)
55. In a series ac circuit the inductive reactance leads by _____. (**90°**, 180°, 270°)
56. In a series ac circuit the capacitive reactance lags by _____. (**90°**, 180°, 270°)
57. In a series resonance circuit X_L and X_C are _____. (in phase, 90° out of phase, **180° out of phase**)
58. The series resistance in a series resonance circuit should be _____, for a sharp increase in current at resonance. (as high as possible, **as small as possible**, of any value)
59. The series resonant circuit can select one frequency by providing _____ voltage output at the resonant frequency, compared with frequencies above and below resonance. (**much more**,)
60. In a series resonance circuit the voltage across capacitor is calculated as _____. (**I / x_C** , $I / \sqrt{x_C}$, $I \times x_L$)
61. In a series resonance circuit the voltage across inductor is calculated as _____. (I / x_C , $I / \sqrt{x_C}$, **$I \times x_L$**)
62. In a series resonance circuit, below the resonant frequency, X_C has a higher value than at resonance, and the current is _____. (high, **small**, no change)
63. In a series resonance circuit, above the resonant frequency, X_L is higher than resonance but the _____ has a low value. (**current**, voltage, resistance)
64. In a parallel resonance circuit the branch currents are practically equal when X_L and X_C are _____. (differs, **equal**)
65. In a parallel resonance circuit, above the resonant frequency, there is _____ current in the inductive branch than in the capacitor branch. (more, **less**, equal)
66. The advantage of a parallel resonant circuit is that _____ is maximum only for an ac signal at the resonant frequency. (current, voltage, **impedance**)
67. In a parallel resonant circuit, if a meter is inserted in series with the main line to indicate total line current, it shows the _____ value of line current at the resonant frequency. (maximum, **minimum**, nil)
68. A parallel resonance LC circuit is also called the _____ circuit. (flywheel, rigging, **tank**)
69. The ability of the parallel resonance circuit to supply complete sine wave, when the input is only a pulse, is called _____ effect. (paralleling, tank, **flywheel**)
70. The process of producing sine waves after a pulse of energy has been applied is called _____ of the LC circuit. (paralleling, tank, **ringing**)
71. Higher values of L and C in a resonance circuit result in _____ values of resonant frequency. (higher, **lower**, equal)
72. In general, the higher the ratio of the reactance at resonance to the series resistance, the _____ is the Q factor. (**higher**, lower, same)
73. The Q of a series resonance circuit has the _____ value, if it is calculated with X_C instead of X_L . (lower, higher, **same**)
74. The voltage output at series resonance is _____ times the generator voltage. (2, 3, **Q**)
75. The fundamental nature of Q for a series resonant circuit is seen from the fact that the Q can be determined experimentally by measuring the Q rise in voltage across either L or C and comparing this voltage with the _____ voltage. (L, C, **generator**)
76. Shunt resistance can _____ the Q of a parallel resonant circuit. (increase, **decrease**, have no relation with)
77. The width of the resonant band of frequencies centered around _____ is called the band width of the tuned circuit. (**factor**, G factor, band factor)

CHAPTER - 6

DETAILED KNOWLEDGE OF THE COMPOSITION, PERFORMANCE (STABILITY & TOLERANCE) AND LIMITATIONS OF THE FIXED RESISTORS (CARBON COMPOSITION, CARBON FILM, WIRE WOUND AND METALLIC FILM) AND DESCRIPTION OF VARIOUS TYPES OF VARIABLE RESISTORS AND VARISTORS, KNOWLEDGE OF THE RESISTOR COLOUR CODES, VALUE AND TOLERANCE AND THE SYSTEM OF PREFERRED VALUES AND WATTAGE RATINGS.

- The two main characteristics of a resistor are its :
 - resistance and conductance
 - resistance and current rating
 - resistance and voltage rating
 - resistance and power rating *
- 1 mega ohm is equal to
 - 10^9 ohm
 - 10^6 ohm *
 - 10^5 ohm
 - 10^3 ohm
- The resistance value of a resistor is required to provide the
 - desired current only
 - desired voltage only
 - Both a) and b) are correct *
 - none of the above
- A wire wound resistor is normally used for
 - high current application with low resistance *
 - high current application with high resistance
 - low current application with low resistance
 - low current application with high resistance
- As compared to carbon - composition resistors, carbon film resistor have the advantage of
 - tighter tolerances *
 - less sensitivity to temperature change
 - less noise generated internally
 - all the above *
- In case of a metal film resistor, the exact resistance value is depends on metal spiral's
 - length
 - thickness
 - width
 - all the above *
- In terms of overall performance, the best resistor is
 - carbon film resistor
 - metal film resistor *
 - carbon composition resistor
 - none of the above
- Both carbon and metal film resistors can be distinguished from carbon - composition resistors by the fact that in case of carbon composition resistor
 - the length is more
 - the weight is more
 - the diameters of the ends are a little larger than that of the body *
 - none of the above
- Surface mount resistors are also known as
 - metal film resistor
 - carbon film resistor
 - carbon composition resistor
 - chip resistors *
- The exact resistance value of chip resistor is determined by
 - length of the carbon wire
 - specific resistivity of the carbon wire
 - composition of carbon itself *
 - none of the above
- The end electrodes of chip resistors are
 - V - shaped
 - U - shaped
 - L - shaped
 - C - shaped *
- Fusible resistors serves the dual functions of a
 - resistor and a fuse *
 - resistor and regulator
 - resistor and comparator
 - register and detector
- The value of red stripe on a carbon resistor with four band code is
 - 4
 - 5
 - 2 *
 - 1

- a. last number in the numerical value of the resistance
b. multipliers *
c. tolerance
d. none of the above
35. Variable resistors can be
a. wire wound only
b. carbon type only
c. both a) and b) are correct *
d. none of the above
36. In a variable resistor, with a variable taper, one half rotation changes resistance by
a. one third of maximum value
b. one half the maximum value *
c. one fourth of maximum value
d. none of the above
37. Carbon composition resistors are used where
a. performance requirements are demanding
b. where noise is not at all allowed
c. where low cost is main consideration *
d. none of the above
38. Examples of non-linear elements are
a. diode
b. thermistor
c. varistor
d. all the above *
39. Rheostats are normally used to
a. vary the I *
b. tap part of V
c. both a) and b) are correct
d. none of the above
40. Potentiometers are normally used to
a. vary the I
b. tap part of V *
c. both a) and b) are correct
d. none of the above
41. Wire-wound ceramic type resistors are used to
a. carry a comparatively high current and dissipate low power
b. carry a comparatively low current and dissipate high power
c. carry a comparatively low current and dissipate low power
d. carry a comparatively high current and dissipate high power *
42. A rheostat normally has
a. one terminal
b. two terminals *
c. three terminals
d. four terminals
43. A rheostat has two terminals, one connected to wire-wound resistor and other connected to
a. other end of wire-wound resistor
b. sliding contact arm *
c. either of a) or b)
d. none of the above
44. A potentiometer normally has
a. one terminal
b. two terminals
c. three terminals *
d. four terminals
45. When compared with a rheostat the resistance value of a potentiometer is
a. high *
b. low
c. same
d. either b) or c)
46. When compared with a potentiometer, the resistance value of a rheostat is usually
a. high
b. low *
c. same
d. either b) or c)
47. The resistive material used in a potentiometer is normally
a. carbon or graphite compound *
b. tungsten
c. chromium
d. zinc
48. The formula that determines the number of electrons which can be accommodated in any level is
a. $2n^2$ *
b. n^2
c. $4n$
d. $4n^2$
49. The tiny block formed by the arrangement of a small group of atoms is called the
a. space lattice.
b. unit cell.*
c. cubic cell.
d. primitive cell.
50. A unit cell is
a. a unit cube containing the smallest number of atoms.
b. a group of atoms which forms the cubic structure.
c. the smallest group of atoms which when regularly repeated forms the crystal.*
d. none of the above.
51. The coordination number of a cubic structure is
a. 8.
b. 6.*
c. 4.
d. 2.
52. Most of the common metals have _____ structures.
a. cubic.*
b. linear.
c. hexagonal.
d. none of these.
53. The number of crystal systems is
a. 3.
b. 4.
c. 7.*
d. 14.
54. A primitive cell is
a. a unit cell in which lattice points are only at its corners.*
b. a unit cell of a simple cubic crystal.
c. the cell that contains the smallest group of atoms.
d. a basic building block of a crystal.
55. An atom in a crystal vibrates at a frequency determined by
a. crystal temperature.
b. crystal heat content.

98. What type of magnetic behaviour is observed in a type 1I; superconductor ?
 a. Perfect diamagnetism.* b. Perfect paramagnetism.
 c. Perfect ferromagnetism. d. Perfect ferrimagnetism.
99. Superconductivity is observed for
 a. dc and low frequency.*
 b. ac and high frequency.
 c. infrared frequencies.
 d. frequencies having no effect.
100. In a super-conductor the value of critical density depends upon
 a. temperature. b. magnetic field strength.
 c. both (a) and (b).* d. none of these.
101. The value of critical field below the transition temperature will
 a. decrease. b. increase.*
 c. not be affected at all. d. none of these.
102. At transition temperature the value of critical field is
 a. -ve. b. +ve.
 c. zero.* d. infinity.
103. A super-conductor material is
 a. copper. b. silver.
 c. mercury.* d. gold.
104. Annealing of metals
 a. removes internal stresses.
 b. increases conductivity.
 c. increases the grain size.
 d. both (a) and (b).*
105. Cold working operation
 a. increases conductivity.
 b. increases resistivity.*
 c. converts a thicker wire into a thin wire.
 d. removes internal stresses.
106. The property of materials by which they can be drawn into wires is known as
 a. malleability. b. elasticity.
 c. ductility.* d. plasticity.
107. The property of material by which it can be rolled into sheets is called the
 a. malleability.* b. elasticity.
 c. ductility. d. plasticity.
108. The formation of oxide film on a metal due to atmospheric exposure reduces
 a. creep limit. b. stiffness.
 c. toughness.* d. none of these.
109. Gold, silver and copper are good electrical conductors because their outer orbits contain
 a. one electron.*
 b. two electron.
 c. one proton.
 d. more than two electrons.
110. Silver is not used as a conductor due to its
 a. poor conductivity.
 b. higher cost.*
 c. low mechanical strength.
 d. all of the above.
111. High purity copper is obtained by
 a. rolling. b. smelting.
 c. electric refining.* d. roasting.
112. The best variety of copper from the point of view of electrical conductivity is
 a. pure annealed copper.*
 b. hard drawn copper.
 c. induction hardened copper.
 d. copper containing silicon traces.
113. The best variety of copper from the point of view of mechanical strength is
 a. pure annealed copper. b. hard drawn copper.*
 c. cast copper. d. soft copper.
114. After copper is hard drawn, it is then _____ so as to restore its properties.
 a. softened. b. annealed.*
 c. tampered. d. none of these.
115. _____ increases when copper with manganese increases
 a. Specific gravity. b. Electrical conductivity.
 c. Resistivity.* d. X-section.
116. Alloying of copper with manganese increases
 a. tensile strength.* b. melting point.
 c. electrical conductivity. d. specific gravity.
117. Which of the following will have the lowest resistivity?
 a. Pure copper.*
 b. Copper alloyed with manganese.
 c. Copper alloyed with silicon.
 d. Copper alloyed with phosphorus.
118. Cadmium is added to copper primarily to
 a. reduce its cost.
 b. improve its mechanical strength.*
 c. improve electrical conductivity.
 d. all of the above.
119. Resistance of copper _____ when it is compressed.
 a. remains unaffected. b. increases.
 c. decreases.*
120. Percentage of cadmium added to copper to improve its tensile strength is
 a. 0.8 to 1 %* b. 1 to 2 %
 c. 2 to 5 % d. 0.01 to 1 %
121. Resistivity of copper at absolute zero is

- a. 1.76×10^{-8} W-m. b. 1.64×10^{-8} W-m. c. it does not react with oxygen.
c. negligibly small.* d. zero. d. all of the above.
122. Which one of the following is the poorest electrical conductor ?
a. steel. b. Carbon.*
c. Copper. d. Aluminium.
123. Which one of the following is the best electrical conductor ?
a. Copper. b. Aluminium.
c. Silver.* d. Cadmium copper.
124. Copper, though costly, finds use in windings for electrical machines because
a. it offers low contact resistance.
b. it can be easily soldered and welded.
c. it gives less bulky windings leading to compact machines.
d. all of the above. *
125. Copper and aluminium are not used for heating elements. This is due to
a. their low melting points.
b. their great tendency for oxidation.
c. low resistivity leading to requirement of very large length of wires.*
d. all of the above.
126. Which one of the following metals has the lowest temperature coefficient of resistance ?
a. Gold.* b. Copper.
c. Aluminium. d. Kanthal.
127. Conductivity of aluminium is _____ time of that of copper.
a. 1.63 b. 0.6*
c. 2.5 d. 0.4
128. Copper has low _____ in comparison to that of aluminium.
a. melting point. b. specific gravity.
c. resistivity.* d. conductivity.
129. In many applications copper is being replaced by aluminium. This is due to
a. low cost, abundantly availability and low specific gravity of aluminium in comparison to that of copper. *
b. low resistivity of aluminium in comparison to that of copper.
c. more ductility and malleability of aluminium in comparison to that of copper.
d. low temperature coefficient of resistance of aluminium in comparison to that of copper.
130. Aluminium does not corrode in atmosphere because
a. it is a noble metal.
b. atmospheric oxygen can only diffuse very slowly through the oxide layer which is formed on the surface of the aluminium.*
131. Carbon is _____ material.
a. conducting. b. dielectric.
c. semi-conducting.* d. non-conducting.
132. A carbon resistor contains
a. carbon crystals.
b. solid carbon granules.
c. finely divided carbon block.*
d. none of the above.
133. Carbon resistors are widely employed because they are
a. compact. b. cheap.
c. easy to make. d. all of these. *
134. Carbon rods are used in cells (dry as well as wet) because
a. they serve as conductor.
b. they can resist the attack of acid of battery.
c. both (a) and (b). *
d. none of these.
135. Carbon electrodes are used in
a. cinema projectors. b. electric arc furnaces.
c. GLS lamps. d. both (a) and (b). *
136. In graphite, bonding is
a. metallic.
b. covalent.
c. Vander Waals.
d. Vander Waals and covalent. *
137. Graphite is a good lubricant because
a. the sheets are bonded to one another by Vander Waals forces. *
b. the sheets are bonded to one another covalently.
c. both (a) and (b).
d. none of these.
138. Nickel is employed in
a. bulb filaments.
b. electrodes of thermionic tubes. *
c. pressure sensitive elements.
d. contactors for starters.
139. Tin is employed in
a. lamp filaments.
b. contactors for motor starters.
c. low current fuses. *
d. none of the above.
140. _____ can be used for making cable sheaths.
a. Lead. * b. Copper.
c. Aluminium. d. Cast iron.
141. Alloying, is done basically to
a. increase melting point. b. increase hardness.
c. change resistivity.* d. mix impurity.
142. High resistivity materials are used in

- a. incandescent lamps. b. heating elements.
c. precision instruments. d. motor starters.
e. all of the above.*
143. Constantan is an alloy composed of
a. 86% copper, 12% manganese and 2% nickel.
b. 76% nickel, 21% chromium, 2% manganese and 1% iron.
c. 60% copper and 40% nickel.*
d. 40% copper, 40% nickel and 20% carbon.
144. Platinum is employed in
a. electrical contacts and thermo-couples.
b. heating elements for electric furnaces.
c. grids for special purpose vacuum tubes.
d. all of the above.*
145. _____ is employed as heating element for temperatures up to 1350°C.
a. Nichrome.* b. Silicon carbide.
c. Copper. d. Carbon.
146. _____ is employed for winding of coils for dc motor starters.
a. Constantan. b. Nichrome.*
c. Copper. d. Aluminium.
147. _____ has the highest operating temperature.
a. Manganin. b. Eureka.
c. Kanthal. d. Nichrome.
148. _____ has the lowest temperature coefficient of resistance.
a. Nichrome.* b. Constantan.
c. Molybdenum. d. Kanthal.
149. Which of the following has zero temperature coefficient of resistance ?
a. Manganin.* b. Nichrome.
c. Carbon. d. Aluminium.
150. A good electrical contact material should have the properties of
a. high melting point.
b. good thermal conductivity.
c. high resistance to corrosion.
d. high conductivity.
e. all of the above.
151. Electrical contact resistance is better between
a. metal and insulator. b. metal and carbon.*
c. metal and metal. d. carbon and carbon.
152. _____ has the best damping properties.
a. Diamond. b. Mild steel.
c. Cast iron.* d. High speed steel.
153. Addition of 0.3 to 4.5% silicon to iron the electrical resistivity of iron
a. increases.* b. reduces.
c. has no effect on d. none of these.
154. Annealing is employed for
a. making steel hard. b. making steel soft.*
c. adding carbon to steel. d. none of the above.
155. In annealing process, cooling of steel is carried out in
a. air. b. water.
c. the furnace itself.* d. none of the above.
156. _____ is employed for hardening of steel.
a. Carburizing.* b. Annealing.
c. Normalizing. d. None of these.
157. The steel is temper-hardened mainly to increase
a. carbon content. b. hardness.
c. ductility.* d. all of these.
158. Steel wire is used as an/a
a. earth wire.
b. core wire in ACSR.
c. overhead telephone wire.
d. all of the above.*
159. ACSR means
a. aluminium core standard resistor.
b. aluminium conductors steel reinforced.*
c. all conductors steel reinforced.
d. aluminium core steel resistors.
160. Stranding of conductors is done in order to
a. affect the saving in cost.
b. affect the saving in material.
c. have flexibility and easiness in handling.*
d. increase the conductivity.
161. Steel core is provided at the centre of aluminium wires in ACSR conductors in order to increase the
a. tensile strength.* b. conductivity.
c. resistivity. d. shear strength.
162. Stranded conductors, over the equivalent single conductors, have the advantage(s) of
a. greater flexibility.
b. less liability to break.
c. both (a) and (b). *
d. none of these.
163. If the resistance of a conductor does not follow Ohm's law, it is said to be
a. bad conductor . b. non-conductor.
c. non-linear resistor.* d. super-conductor.
164. Non-linear resistors
a. cause non-uniform heating.
b. produce harmonic distortion.*
c. follow Ohm's law at low temperatures only.
d. follow Ohm's law at high temperatures only.
165. Which of the following are non-conductors of electricity ?
a. Air and most of the other gases.
b. Non-metal solids except carbon.*

- c. Pure water and liquids in general except mercury.
166. Solder is an alloy of
a. lead and tin.*
b. aluminium and copper.
c. copper, tin and zinc.
d. copper and lead.
167. Which one of the following is a hard solder ?
a. Tin-lead. b. Copper-zinc.
c. Tin-silver-lead.* d. none of the above.
168. Thermo-couple is based on
a. seebeck effect.* b. Thomson effect.
c. Peltier effect.
169. Which one of the following is not a high resistive material ?
a. Manganin. b. Nichrome.
c. Aluminium.* d. Constantan.
170. Which one of the following is not a low resistive material ?
a. Tungsten.* b. Bronze.
c. Copper. d. Brass.
171. Which one of the following materials has negative temperature coefficient of resistance ?
a. Tungsten. b. Carbon. *
c. Aluminium. d. Steel.
172. Which one of the following has lowest conductivity ?
a. Manganin. b. Nichrome.
c. Kanthal.* d. Tantalum.
173. Which one of the following materials does not have covalent bond ?
a. Metals.* b. Silicon.
c. Organic polymers. d. None of these.
174. The resistivity of semi-conductor materials lies between
a. 10^0 and 10^2 W-mm. b. 10^0 and 10^2 W-m.*
c. 10^0 and 10^2 W-cm. d. 10^{10} and 10^{12} W-m.
175. Semi-conductors produced by thermal energy alone are known as _____ semi-conductors.
a. thermal. b. extrinsic.
c. intrinsic.* d. none of these.
176. The resistivity of semi-conductors depends greatly on
a. temperature. b. illumination.
c. electric field. d. impurities introduced.
e. all of the above.*
177. Which of the following are the best semi-conductors?
a. Germanium and silicon.*
b. Carbon and silicon.
c. Selenium and boron.
d. Selenium and silicon.
178. The structure of a semiconductor is like that of a
a. rhombus. b. diamond.*
c. simple cubic. d. BCC.
179. Which type of electron pair exists in a semiconductor?
a. Heteropolar. b. Homopolar.*
c. Ionic. d. Non-ionic.
180. Which one of the following materials is a semiconductor ?
a. Silica. b. Phosphorus.
c. Boron.* d. Steel.
181. Selenium is _____ semiconductor.
a. intrinsic.* b. extrinsic.
c. n-type. d. p-type.
182. N-type impurity is
a. Fe b. Ga
c. Sb* d. B.
183. The room temperature resistivity (in ohm-meter) of pure silicon is
a. 3000* b. 300
c. 30 d. 3
184. The impurity atoms in semiconductors
a. increase the energy gap.
b. reduce the energy gap.*
c. increase the kinetic energy of valence electrons.
d. inject more charge carriers.
185. At zero degree Kelvin, germanium acts as
a. superconductor. b. dielectric.
c. insulator.* d. semiconductor.
186. A pure semiconductor, under ordinary conditions, acts as a/an
a. insulator.* b. conductor.
c. super conductor. d. ferro-electric material.
187. The conductivity of semiconductors depends upon the
a. number of current carriers present per unit volume.
b. mobility of the current carriers.
c. both (a) and (b).*
d. none of these.
188. The conductivity of an extrinsic semi conductor _____ with the increase in temperature.
a. decreases. b. increases.*
c. remains unaffected. d. none of these.
189. The conductivity of a pure semiconductor _____ with the increase in temperature.
a. increases linearly.
b. decreases linearly.
c. increases exponentially.*
d. decreases exponentially.
190. The minority carrier concentration is largely a function

- of
- temperature.*
 - amount of doping .
 - forward biasing voltage.
 - reverse biasing voltage.
191. In a semiconductor, the movement of holes is due to movement of
- electrons in conduction band.
 - electrons in valence band.*
 - holes in conduction band.
 - holes in valence band.
192. The donor atoms in an n-type semiconductor at normal temperature
- carry a positive charge.
 - carry a negative charge.*
 - are neutral.
 - none of the above.
193. Ferri-magnetic materials are used as
- super conductors. b. conductors.
 - semiconductors.* d. insulators.
194. The Hall coefficient of an intrinsic semiconductor is
- positive under all conditions.
 - negative under all conditions.
 - zero under all conditions.*
 - zero at 0° K.
195. For a particular material the Hall coefficient was found to be zero. The material is
- intrinsic semi-conductor.*
 - extrinsic semi-conductor.
 - metal.
 - insulator.
196. Hall effect can be used to find
- the carrier concentration.
 - whether a conductor is p-type or n-type.
 - both (a) and (b).*
 - none of these.
197. In Hall's effect, the output voltage produced across the crystal is due to
- movement of charge carriers towards one end.*
 - induced voltage by the applied magnetic field.
 - voltage drop across the crystal due to flow of current through it.
 - none of the above.
198. Piezo-electric materials serve as source of _____ waves.
- micro. b. ultrasonic.*
 - musical. d. resonant.
199. Which one of the following materials is not the piezo electric material ?
- Quartz. b. Rochelle salt.
 - Glass.* d. Barium titanate.
 - Lead zirconate titanate.
200. Rochelle salt has _____ Curie point(s).
- one b. two*
 - three d. no
201. Which one of the following statements is not true regarding Rochelle salt ?
- It possesses anisotropic properties.
 - It is a salt of tartaric acid.
 - Its crystal possesses a centre of symmetry.*
 - It crystallises in the orthorhombic system.
202. Which of the following statements are true of piezo electric crystals ?
- Their crystal structure possesses a centre of symmetry.
 - They always exhibit ferro-electricity.
 - They are necessarily poor electrical conductors.
 - They exhibit a relative permittivity less than unity.
- Select correct answer using the codes given below
- Codes :
- 1, 2 and 4 b. 2, 3 and 4
 - 2 and 3* d. 1, 2 and 3
203. Piezo-electricity has been observed in
- nickel. b. glass.
 - quartz.* d. mica.
204. Piezo-electric materials find use in
- conversion of electrical energy into mechanical one.
 - conversion of mechanical energy into electrical one.
 - both (a) and (b).*
 - none of these.
205. The readiness of a material to accept magnetism is expressed by its
- permeability.* b. permittivity.
 - susceptibility. d. coercivity.
206. The permeability
- has no relation with permittivity.
 - is related with permittivity by the velocity of electromagnetic waves.*
 - is related with permittivity by the crystal law.
 - none of the above.
207. Magnetic susceptibility of material having relative permeability is given as
- $\frac{\mu_r}{\mu_0}$ b. $\frac{\mu_0}{\mu_p}$
 - $\frac{\mu_0}{\mu_p - 1}$ d. $\mu_0(\mu_r - 1)$ *
208. The magnetization of any magnetic material takes place by
- electron spin.
 - electron orbital motion.
 - spin of nucleus about its axis.
 - all of the above.*

209. The concept of 'magnetic domains' is the basis of the theory of
 a. ferromagnetism.* b. paramagnetism.
 c. diamagnetism. d. none of these.
210. The sum of magnetic moments in unit volume of a solid is known as
 a. permeability. b. susceptibility.
 c. magnetization.* d. coercivity.
 e. field strength.
211. The spontaneous magnetization is the most important characteristic of _____ materials.
 a. paramagnetic. b. ferromagnetic.*
 c. diamagnetic. d. all of the above.
212. In ferro-magnetic materials, the atomic magnetic moments are
 a. parallel.*
 b. antiparallel and unequal.
 c. neither (a) or (b).
 d. none of these.
213. Magnetization is non-linearly related to the applied field in case of _____ materials.
 a. diamagnetic. b. ferromagnetic.*
 c. paramagnetic. d. all of these.
214. In ferro-magnetic materials, the spin moments associated with two sets of atoms are aligned
 a. in a random fashion.
 b. antiparallel to each other.
 c. parallel to each other.*
 d. antiparallel but equal in magnitude.
215. The magnetic materials, in which the permanent magnet moment (due to electron spin) are already aligned because of bonding forces, are called the _____ materials.
 a. ferro-magnetic.* b. diamagnetic.
 c. para-magnetic. d. ferri-magnetic.
216. The magnetic domains, during the process of magnetization of ferro-magnetic materials
 a. only expand.
 b. only rotate.
 c. neither expand nor rotate.
 d. expand first and then rotate.*
 e. rotate first and then expand.
217. In ferro-magnetic materials, the net magnetic moment produced due to magnetization by an applied field
 a. is normal to the applied field.
 b. adds to the applied field.*
 c. subtracts from the applied field.
 d. unpredictable.
218. On application of strong magnetic field to ferro magnetic field, the domain wall motion becomes
 a. irreversible.* b. reversible.
 c. static. d. constant.
219. The intensity of magnetization of a ferro-magnetic solid _____ with the increase in temperature.
 a. increases. b. decreases.*
 c. remains unaffected. d. none of these.
220. In the absence of external magnetic field
 a. the net magnetization is zero.*
 b. the domains are aligned in one direction.
 c. the domains are not magnetized.
 d. none of the above.
221. The magnetization vector M is defined as dipole moment per unit.
 a. meter. b. meter²
 c. volume.* d. magnetic field.
222. Magnetization vector M is expressed in
 a. Tesla. b. A/m.*
 c. A/m² d. A-m.
223. The permeability of iron can be increased by
 a. alloying with cobalt.*
 b. its purification.
 c. controlling carbon percentage.
 d. any of the above processes.
224. The distortion of magnetic field is considerable under the influence of _____ materials.
 a. paramagnetic. b. diamagnetic.
 c. ferromagnetic.* d. all of the above.
225. Susceptibility is positive and very large in case of _____ materials.
 a. ferro-magnetic.* b. paramagnetic.
 c. diamagnetic d. air.
226. For ferromagnetic materials the susceptibility is
 a. constant, positive and very high.
 b. positive and very high but not constant.*
 c. always negative.
 d. positive but very low.
227. Iron is a
 a. ferro-magnetic.*
 b. ferrimagnetic.
 c. paramagnetic.
 d. antiferromagnetic material.
228. Increase in percentage of carbon in carbon steels reduces
 a. resistivity. b. coercive force.
 c. permeability.* d. retentivity.
229. _____ cause(s) magnetic ageing.
 a. Mechanical vibrations.
 b. Temperature conditions.
 c. Presence of strong external fields.
 d. Variations in the external magnetic circuits.
 e. All of the above factors.*
230. _____ is the most detrimental impurity in the

magnetic materials.

- a. Sulphur. b. Carbon.*
c. Nitrogen. d. none of these.

231. Uniaxial anisotropy can be induced in bulk material by
a. magnetic annealing.
b. magnetic quenching.
c. cold working.
d. any of the above method.*

232. Practically all organic substances are _____ materials.
a. paramagnetic. b. diamagnetic.*
c. ferro-magnetic. d. ferri-magnetic.

233. In a diamagnetic material, the effect of an applied magnetic field is that
a. there is a net reduction in flux density.
b. the induced magnetization is in opposition to the applied field.
c. a net dipole moment is induced in the material.
d. all of the above.*
e. none of these.

234. Materials lacking in permanent magnetic dipoles are known as
a. diamagnetic materials* b. ferromagnetic materials.
c. ferrites. d. paramagnetic materials.

235. Which of the following statements(s) is/are correct ?
1. Ferromagnetic substances have very large negative values of susceptibility.
2. Diamagnetic substances have very small negative values of susceptibility.
3. Paramagnetic substances have very small positive values of susceptibility.
4. The permeability of diamagnetic substances is slightly greater than unity.

Select the correct answer using the codes given below

- a. 1 and 4. b. 2 and 3.*
c. 3 and 4. d. 4 alone.

236. Interaction between the neighbouring dipoles is negligible in case of _____ materials.
a. paramagnetic.* b. diamagnetic.
c. ferromagnetic. d. ferrimagnetic.

237. In _____ materials the atomic magnetic moments are oriented, in a random fashion, in a solid.
a. diamagnetic. b. paramagnetic.*
c. ferromagnetic. d. none of these.

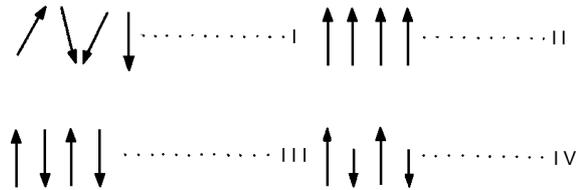
238. A material with unequal, antiparallel atomic magnetic moments is called the _____ material.
a. ferrimagnetic.* b. ferromagnetic.
c. antiferromagnetic. d. none of these.

239. The spins in a ferrimagnetic substance are
a. oriented in a random fashion.
b. all aligned parallel.

- c. all aligned antiparallel cancelling out exactly sub-lattice magnetization.
d. Partially aligned antiparallel without exactly cancelling out sub-lattice magnetization.*

240. Ferrimagnetic materials are generally used as
a. conductors. b. insulators.
c. semiconductors.* d. resistors.

241. The following figures give the schematic arrangement of spins of four different types of magnetic materials. The ferromagnetic and ferrimagnetic materials refer to arrangements



- a. I and II respectively. b. II and III respectively.
c. I and III respectively. d. II and IV respectively.*

242. Ferrites are _____ materials.
a. ferromagnetic.* b. ferrimagnetic.
c. diamagnetic. d. antiferromagnetic.

243. The resistivity of ferrites is _____ that of ferromagnetic materials.
a. less than.
b. equal to.
c. slightly more than.
d. very much higher than*

244. Ferrites are _____ materials.
a. hard.
b. brittle.
c. not easily machinable.
d. hard, brittle and not easily machinable.*

245. Dielectric loss in ferrites is
a. zero. b. very low.
c. low. d. very high.*

246. Magnetically saturated ferrite
a. interacts with electro-magnetic waves.*
b. produces large hysteresis.
c. produces low eddy currents.
d. all of the above.

247. Magnetic material in VHF applications is
a. silicon steel. b. Alnico.
c. cobalt salt. d. ferrite.*

248. High frequency transformer core are generally made from
a. Alnico. b. ferrites.*
c. Mu-metal. d. silicon steel.

249. In antiferromagnetic materials, the spin moments associated with two sets of atoms are aligned

- a. parallel to each other.
 b. antiparallel to each other.*
 c. antiparallel but of unequal magnitudes.
 d. randomly.
250. The net magnetic moment is zero in case of _____ materials.
 a. ferromagnetic. b. antiferromagnetic.*
 c. ferrimagnetic. d. none of these.
251. Which one of the following is not the antiferromagnetic material ?
 a. Chromium. b. N_2O .
 c. Bismuth.* d. MnO .
252. Air exhibits
 a. ferromagnetism. b. paramagnetism.*
 c. antiferromagnetism. d. ferrimagnetism.
253. Soft magnetic materials have
 a. steeply rising magnetization curve.
 b. relatively small and narrow hysteresis.
 c. small energy loss per cycle of magnetization.
 d. all of the above.*
254. Soft magnetic material is
 a. tungsten steel. b. Alcomax.
 c. bismuth. d. iron.*
255. Soft magnetic materials are widely used in construction of cores for
 a. electro-magnets. b. relays.
 c. transformers. d. reactors.
 e. all of the above.*
256. Hard magnetic materials have
 a. high retentivity.
 b. high coercivity.
 c. high energy loss per cycle of magnetization.
 d. all of the above.*
257. Hard magnetic materials are suitable for making
 a. transformer core. b. electro-magnets.
 c. permanent magnets* d. reactor core.
258. Which of the following is not the soft material ?
 a. Silicon steel. b. Tungsten steel.*
 c. Nickel-iron alloys. d. Iron.
259. Which one of the following is not the hard material ?
 a. Nickel-iron alloys.* b. Alnico.
 c. Carbon steel. d. Platinum cobalt.
260. The change in resistance in a magnetic field is called the
 a. skin effect.
 b. Hall's effect.
 c. Magneto-resistance effect.*
 d. none of the above.
261. The change in dimensions during the process of magnetization is termed as
 a. skin effect. b. magnetostriction.*
 c. Hall's effect. d. Peltier effect.
262. The converse of magneto-striction effect is
 a. Villari effect.* b. Curie effect.
 c. Skin effect. d. Seebeck effect.
263. The relative magnetization under a given field _____ as the temperature approaches the Curie point.
 a. increases. b. decreases.*
 c. remains unaffected. d. unpredictable.
264. Above Curie temperature, ferromagnetic material exhibits
 a. paramagnetism.* b. antiferromagnetism.
 c. ferrimagnetism
265. Characteristics of a good magnetic core material is are
 a. high permeability. b. high resistivity.
 c. high saturation value. d. all of the above.*
266. The desired properties for substances required for making permanent magnets are
 a. high residual magnetism.
 b. large coercive force.
 c. high saturation value.
 d. all of the above.*
267. The ideal core material for small reactors and transformers used in communication equipment should have
 a. small hysteresis loss.
 b. constant permeability.
 c. small eddy current loss.
 d. all of the above.*
268. Addition of 0.5 to 5% silicon to iron
 a. increases the electrical resistivity of iron leading to reduced eddy current loss.
 b. reduces magnetostriction effect.
 c. reduces the hysteresis loss.
 d. increase the hysteresis loss.
 e. (a),(b) and (c) of the above.*
269. Which one of the following have the maximum permeability ?
 a. Grain oriented silicon steel.*
 b. 4% silicon steel.
 c. Pure iron.
270. Area of hysteresis loop represents
 a. copper loss. b. eddy current loss.
 c. hysteresis loss.*
271. Silicon content in steel reduces
 a. hysteresis loss.*
 b. eddy current loss.
 c. copper loss.

318. In ceramic insulation, glaze is employed to improve _____ properties.
 a. mechanical.* b. electrical.
 c. chemical. d. thermal.
319. Bitumens are employed to provide protection against
 a. temperature. b. corrosion.*
 c. moisture. d. none of these.
320. In electrical machines varnish is mainly used in
 a. impregnation. b. coating.
 c. adhesion. d. all of these.*
321. Varnish used in coating, impregnation and adhesion should have the property(ies) of
 a. quick drying.
 b. chemical stability.
 c. setting hard and with good surface.
 d. all of the above.*
322. Sometimes varnish is coated on hard porous insulating materials. This is done to improve
 a. resistance to moisture.
 b. creeping discharge voltage.
 c. outer appearance.
 d. all of the above.*
10. When the contact of a variable resistance moves closer to one end, the resistance _____ between that terminal and variable arm. (increases, **decreases**, remain same)
11. The way resistance varies with shaft rotation in a variable resistor, is called _____ of the control. (movement, **taper**, rotation)
12. In a variable resistor, for a nonlinear taper through resistance can change more gradually at one end, with _____ changes at the opposite end. (lower, **bigger**, same)
13. For the example of a volume control, its audio taper allows _____ changes in R at low setting. (bigger, **smaller**, no)
14. Deposited carbon resistors consist of _____ rods which have a carbon film deposited on them. (metallic, plastic, **ceramic**)
15. High-voltage ink film resistor consist of a ceramic base on which a special _____ is laid down in a helical band. (registive rod, registive plate, **registive ink**)
16. In cathode ray circuit normally _____ type of resistors are used. (carbon composition, deposited carbon, **high voltage ink film**)

Fill in the blanks

1. In a five band resistor coding system, if blue stripe is there in fifth place, then it indicates the tolerance of _____. ($\pm 1\%$, $\pm 0.5\%$, **$\pm 0.25\%$**)
2. In a five band resistor coding system, if violet colour is there in fifth place, then it indicates the tolerance of _____. ($\pm 1\%$, $\pm 0.5\%$, **$\pm 0.1\%$**)
3. A precision resistor which used five band code, is having a tolerance of $\pm 2\%$ is indicated by a _____ colour stripe in fifth place. (brown, **red**, green)
4. A precision resistor which used five band code, is having a tolerance of $\pm 0.1\%$, is indicated by a _____ colour stripe in fifth place. (brown, red, **violet**)
5. Generally the body colour of chip resistor is _____. (black, brown, **white**)
6. Chip resistors can be identify by dark film on _____ side. (both, **one**)
7. End electrodes of chip resistor are _____ shaped. (V, U, C)
8. If on a chip resistor, four digits are there, then the fourth digit indicates the _____. (tolerance, total value of resistance, **multiplier**)
9. The middle terminal of a circular variable resistance is connected to _____. (end terminal, **variable arm**, body)
17. Non-linear elements V-I curves are _____. (straight, **not straight**)
18. In some circuit for over voltage protection _____ are used. (**varistors**,)
19. The resistance value of a varistor decrease when the current _____. (**increase**, decrease, remain same)
20. A thermistor has _____ negative coefficient of resistance. (Small, **large**)
21. Rheostats are normally have _____ terminals. (**two**, three, four)
22. Potentiometers are normally have _____ terminals. (two, **three**, four)
23. Rheostats are connected in _____ with load and V source. (**series**, parallel, series-parallel)
24. For a resistor a large physical size indicates a _____ power rating. (**higher**, lower, medium)
25. Higher voltage resistors can operate at _____ temperature. (**higher**, lower)
26. _____ resistors are physically larger with higher voltage ratings than carbon resistors. (metal film, chip, **wire-wound**)

27. The power rating of a resistors specifies the maximum power the resistors can dissipate _____(with excessive heat, **without excessive heat**)
28. The waltage rating of the resistor is generally _____than the actual power dissipation. (less, **more**, equal)
29. Resistors with higher resistance value usually have _____wattage ratings. (**lower**, higher, same)
30. Normally the lower the power rating, the _____the actual physical size of the resistors. (bigger, **smaller**)
31. In a wire wound resistor the length of wire and its _____ determine the resistance of the unit. (**specific resistivity**),
32. Carbon film resistors generated _____noise internally than carbon composition resistors. (**less**, more, equal)
33. Carbon film resistors generally have _____sensitivity to temperature changes than carbon composition registers. (**less**, more, equal)
34. Metal film resistors have _____precise resistance value than carbon film resistors. (**more**, less)
35. Metal film resistors are affected _____by temperature changes and aging. (more, **very little**, maximum)
36. Metal film resistors are generating _____ noise internally. (more, **very little**, maximum)
37. Chip resistors are normally temperature _____. (mon-stable, **stable**)
38. The value of black stripe on a carbon resistor is _____. (1, 2, **0**)
39. The value of brown stripe on a carbon resistor with four band code is _____. (0, **1**, 2)
40. 4 is the value for a _____colour stripe on a carbon resistor. (**yellow**, green)
41. 5 is the value for a _____colour stripe on a carbon resistor. (yellow, **green**)
42. The value of grey stripe on a carbon resistor is _____. (6, **8**, 9)
43. The value of white stripe on a carbon resistor is _____. (7, 8, **9**)
44. In resistance fourth stripe colour coding, gold and silver are used most often to indicate _____. (truentional decimel multiplier, **how accurate the R value is**, maximum R value)
45. In a resistance, if first stripe is red, second is green and third is also red, then the value of the resistance is _____ohm. (5200, **2500**, 1600)
46. In a resistance if first stripe is red, second is green and third is black, then the value of the resistance is _____ohm. (**25**, 2500, 250)
47. In a fourth band resistor colour coding if silver is used as fourth stipe, it indicates _____ tolerance. ($\pm 20\%$, **$\pm 10\%$** , $\pm 5\%$)
48. In a fourth band resistor colour coding if gold is used a fourth stipe, it indicates _____ tolerance. ($\pm 20\%$, $\pm 10\%$, **$\pm 5\%$**)
49. In a fourth band resistor colour coding if no colour band is used for tolerance, then that resistance must have _____ tolerance. (nil, $\pm 10\%$, **$\pm 20\%$**)
50. Five band resistor colour code is used for _____precise R values. (**more**, less, nil)
51. In five band resistor colour code, first three colour stripe indicate _____. (total resistanc value, **first three digit of R**)
52. In five band resistor colour code, the fifth stipe indicate _____. (decimal multiplier, **tolerance**, fraction of R)
53. In five band resistor colour code, the brown colour used as fifth stripe indicate tolerance of _____. ($\pm 2\%$, $\pm 0.5\%$, **$\pm 1\%$**).



CHAPTER - 7

DETAILED KNOWLEDGE OF THE CONSTRUCTION, PRINCIPLES OF OPERATION, APPLICATION AND COLOUR CODING OF VARIOUS TYPES OF CAPACITORS.

1. It is possible for dielectric material such as air or paper to hold an electric charge because :
 - a. electrons can flow through air or paper
 - b. electrons cannot flow through air or paper *
 - c. either a) or b)
 - d. none of the above
2. With the dielectric contacting the two conductors connected to the potential difference V , electrons from the voltage source accumulate on the side of the capacitor connected to the
 - a. negative terminal of V *
 - b. positive terminal of V
 - c. both the terminals of V
 - d. none of the above
3. Charging of a capacitor is continuing until the potential difference across the capacitor is
 - a. half of the applied voltage
 - b. one fourth of the applied voltage
 - c. equal to the applied voltage *
 - d. double of the applied voltage
4. Charging of capacitor is instantaneous without any
 - a. series resistance *
 - b. Parallel resistance
 - c. either a) or b)
 - d. none of the above
5. The charging current of a capacitor is transient or temporary, as it flows only until the capacitor is charged to
 - a. one fourth of the applied voltage
 - b. equal of applied voltage *
 - c. half of the applied voltage
 - d. double of the applied voltage
6. In a capacitor, the electric charge is stored in
 - a. metal plates
 - b. dielectric *
 - c. both a) and b) are correct
 - d. none of the above
7. A capacitor consists of
 - a. insulator only
 - b. conductors only
 - c. two insulators separated by a conductor
 - d. two conductors separated by an insulator *
8. A capacitor is concentrating the electric field in
 - a. plates
 - b. dielectric between the plates *
 - c. both a) and b) are correct
 - d. none of the above
9. The function of the capacitor plates and wire conductors is to
 - a. concentrate the electric field
 - b. connect the voltage source V across the dielectric*
 - c. give the mechanical strength to dielectric
 - d. both a) and b) are correct
10. After charging a capacitor, the charge remains in it
 - a. with the applied voltage connected
 - b. without the applied voltage connected
 - c. both a) and b) are correct *
 - d. none of the above
11. When a conducting path is provided across the plates, without any applied voltage, the capacitor will
 - a. charge
 - b. discharge *
 - c. both charge and discharge
 - d. short circuited
12. If the capacitor voltage is more than the applied voltage the capacitor will
 - a. charge
 - b. discharge *
 - c. both charge and discharge
 - d. short circuited
13. The capacitor discharge continues until
 - a. capacitor voltage drops to zero
 - b. capacitor voltage equal to applied voltage
 - c. either a) or b) *
 - d. none of the above
14. During the charging of the capacitor, the negative terminal of the battery will
 - a. repel free electrons in conductor to one plate *
 - b. attract free electrons from another plate
 - c. both a) or b) are correct
 - d. none of the above

15. During the charging of the capacitor, the positive terminal of the battery will
- repel free electrons in conductor to one plate
 - attract free electrons from another plate *
 - both a) and b) are correct
 - none of the above
16. The capacitance of a capacitor depends on
- the area of plates
 - the thickness of dielectric
 - the material of which the dielectric is composed
 - all of the above *
17. The term used to measure the dielectric characteristics of a material is known as
- dielectric strength
 - dielectric constant *
 - dielectric capacity
 - none of the above
18. The insulating quality of a dielectric material is known as
- dielectric strength *
 - dielectric constant
 - dielectric capacity
 - none of the above
19. The dielectric material used in a variable capacitor is usually
- air *
 - mica
 - rubber
 - glass
20. When a relatively high capacitance is desired in a small physical size then the capacitor used is
- mica capacitor
 - paper capacitor
 - variable capacitor
 - electrolyte capacitor *
21. The dielectric constant of electrolyte used in an electrolyte capacitor is
- much lesser than the commonly used dry materials
 - equal to the commonly used dry materials
 - much greater than the commonly used dry materials*
 - either a) or b) is correct
22. Any multiple - plate capacitor is actually a group of capacitors connected in
- series
 - parallel *
 - series - parallel
 - either a) or b)
23. With the thickness of dielectric the capacitance is varied
- directly
 - inversely *
 - either a) or b)
 - none of the above
24. If a high resistance is connected in series with the capacitor the time for charging capacitor is
- decreasing
 - increasing *
 - remain same
 - either a) or c)
25. The 'time constant' for a circuit containing capacitance and resistance is the time required to charge the capacitor to
- 50 % of its full charge
 - 63.2 % of its full charge*
 - 75 % of its full charge
 - 100 % of its full charge
26. The charge and discharge current of a capacitor must always be in
- same direction
 - opposite direction *
 - either a) or b)
 - none of the above
27. The amount of capacitance of a capacitor depends on the
- charging voltage
 - charging current
 - physical construction *
 - none of the above
28. One microfarad is equal to
- 1×10^{-6} F *
 - 1×10^{-9} F
 - 1×10^{-12} F
 - 1×10^{-14} F
29. One nanofarad is equal to
- 1×10^{-6} F
 - 1×10^{-9} F *
 - 1×10^{-12} F
 - 1×10^{-14} F
30. One picofarad is equal to
- 1×10^{-6} F
 - 1×10^{-9} F
 - 1×10^{-12} F *
 - 1×10^{-14} F
31. The charge stored in a $2 \mu\text{F}$ capacitor connected across a 50 V supply is
- 100×10^{-6} C *
 - 50×10^{-6} C
 - 100×10^{-12} C
 - 50×10^{-12} C
32. The charge in a capacitor is equal to
- C/V
 - V/C
 - $C \times V$ *
 - none of the above
33. The capacitance of a capacitor is equal to
- Q/V *
 - V/Q
 - $Q \times V$
 - None of the above
34. In the formula $C = (Q/V)$, the unit of C is
- Coulomb
 - Amps
 - Ohm
 - Farads *
35. In the formula $Q = C \times V$, the unit of Q is
- Coulomb *
 - Amps
 - Ohm
 - Farads
36. The charge stored in the capacitor, which is getting charge with a constant current of $2 \mu\text{A}$, is
- 40×10^{-6} Coulomb *
 - 40×10^{-9} Coulomb
 - 80×10^{-6} Coulomb
 - 80×10^{-9} Coulomb
37. The capacitance of a charged capacitor with 40×10^{-6} coulomb charge and with 20 V potential difference will be
- $1 \mu\text{F}$
 - $2 \mu\text{F}$ *
 - $3 \mu\text{F}$
 - $4 \mu\text{F}$
38. The voltage across a $10 \mu\text{F}$ capacitor which is getting charged by a constant current of 5 mA for 1 sec. will be
- 5 volts
 - 50 volts
 - 100 volts
 - 500 volts *

39. When the area of each plate of a capacitor is made doubled across a same voltage, the amount of charge stored will be
 a. one fourth b. half
 c. doubled * d. no change
40. When the distance between plates of a capacitor is reduced one half; then the capacitance stores
 a. half of the charge b. equal charge
 c. twice the charge * d. none of the above
41. In a capacitor, the field between opposite plates can store more charge in dielectric, when the dielectric is
 a. thicker b. thinner *
 c. both a) and b) d. none of the above
42. The capacitance of a capacitor will be greater when distance between the plates is
 a. more b. less *
 c. either a) or b) d. none of the above
43. The numerical value of the dielectric constant is specified as the ratio of
 a. flux in insulator compared with flux in mica
 b. flux in metal plates compared with flux in mica
 c. flux in insulator compared with flux in air *
 d. flux in metal plates compared with flux in air
44. The relative dielectric constant of air or vacuum is
 a. 1 * b. 2
 c. 3 d. 4
45. Insulators generally have a dielectric constant greater than
 a. 10 b. 5
 c. 3 d. 1 *
46. Aluminium oxides and tantalum oxides are generally used for the dielectric in
 a. mica capacitors
 b. surface mount capacitors
 c. electrolyte capacitors *
 d. film capacitor
47. Practically capacitors used for electronic circuit are using
 a. thick dielectric with high dielectric constant
 b. thick dielectric with low dielectric constant
 c. thin dielectric with high dielectric constant *
 d. thin dielectric with low dielectric constant
48. To determine the length of a time constant in seconds for any particular capacitor resistance circuit, it is necessary to multiply
 a. the capacitance in farad by P. D. in volts
 b. the capacitance in farad by current in ampere
 c. the capacitance in farad by resistance in ohm*
 d. either a) or b)
49. When a capacitor is connected in series in a dc circuit
 a. maximum current can flow through capacitor
 b. minimum current can flow through capacitor
 c. no current can flow through capacitor *
 d. either a) or b)
50. When a capacitor is connected in parallel in a DC circuit, it will
 a. assist any change in circuit voltage
 b. oppose any change in circuit voltage *
 c. either a) or b)
 d. none of the above
51. When a capacitor of sufficient capacitance is connected in parallel with the generator
 a. voltage drop will maximum
 b. voltage pulsation are largely eliminated *
 c. there will be no effect
 d. none of the above
52. To absorb the spark, a capacitor is often used in parallel with a
 a. resistance b. inductance
 c. switch contact * d. none of the above
53. In an ac circuit, a capacitor is often used to
 a. block alternating current but permit the flow of direct current
 b. block direct current but permit the flow of alternating current *
 c. block both direct and alternating current
 d. permit the flow of both direct and alternating current
54. Except for electrolyte capacitors, other capacitors can be connected to a circuit without regard to polarity because
 a. one particular side can be more positive plate
 b. both the side can be more positive plates
 c. either side can be more positive plates *
 d. all the above
55. The polarity of the capacitor voltage is determined by the
 a. plates
 b. insulator
 c. conducting wire
 d. polarity of the charging source *
56. Mica capacitors are often used for
 a. small capacitance values *
 b. high capacitance values
 c. medium capacitance values
 d. very high capacitance values
57. In paper capacitors, to indicate the lead connected to the outside foil, a band is provided at one end, the colour of which is
 a. black or white * b. green or red
 c. grey or violet d. blue or amber
58. Polypropylene is used in the dielectric of
 a. Mica capacitor b. film capacitor *
 c. paper capacitor d. ceramic capacitor

59. For the conductive plates in foil type film capacitor, the material used is
 a. sheets of plastic foil b. sheets or ceramic foil
 c. sheets of mica foil d. sheets of metal foil *
60. When the conductive plates are made by spraying a thin layer of metal on the plastic film, it is known as
 a. foil type film capacitor
 b. metallized type film capacitor *
 c. both a) and b)
 d. none of the above
61. In a ceramic capacitor, to form the capacitor plates, normally
 a. tin is used b. copper is used
 c. zinc is used d. silver is used *
62. The capacitance value of surface mount capacitor is determined by
 a. dielectric constant b. physical area of plate
 c. material of the plate d. both a) and b) *
63. In a variable capacitor, the fixed metal plates connected together to form the
 a. stator * b. rotor
 c. body d. dielectric
64. In a variable capacitor, the movable plates connected together on the shaft to form
 a. stator b. rotor *
 c. body d. dielectric
65. For the tuning capacitor in radio receivers we generally used
 a. mica capacitor b. paper capacitor
 c. film capacitor d. variable capacitor *
66. For temperature compensation, the capacitor often used
 a. mica capacitor b. paper capacitor
 c. film capacitor d. ceramic capacitor *
67. Ceramic disk capacitors for general applications usually have a tolerance of
 a. $\pm 5\%$ b. $\pm 10\%$
 c. $\pm 20\%$ * d. $\pm 50\%$
68. Silver plated mica capacitors are available with a tolerance of
 a. $\pm 1\%$ * b. $\pm 5\%$
 c. $\pm 10\%$ d. $\pm 20\%$
69. Capacitors which are available with 1 to 20 kV voltage ratings are
 a. paper capacitors b. mica capacitors
 c. ceramic capacitors * d. film capacitors
70. The potential difference across the capacitor depends upon the applied voltage and it
 a. must be equal to rated voltage
 b. should be less than the rated voltage
 c. should be more than the rated voltage
 d. either a) or b) *
71. In most electronic circuits, a capacitor has dc voltage applied combined with
 a. a much smaller ac signal voltage *
 b. a much smaller dc signal voltage
 c. a much higher ac signal voltage
 d. a much higher dc signal voltage
72. The usual function of a capacitor is to
 a. block the ac signal voltage
 b. block the dc voltage
 c. pass the ac signal voltage
 d. both b) and c) are correct *
73. Electrolytic capacitors are used in circuits that have
 a. dc voltage
 b. ac voltage
 c. combination of ac and dc voltage *
 d. either a) or b)
74. If electrolytic capacitor is connected in reverse polarity, then
 a. capacitor will not be connected to circuit
 b. capacitor will function normal
 c. capacitor become hot and may explode *
 d. none of the above
75. The disadvantage of electrolytic capacitor, in addition to the required polarization is
 a. high voltage requirements
 b. low capacitance
 c. high leakage current *
 d. all the above are correct
76. Electrolytic capacitors are generally having high leakage current compared with other capacitors, because
 a. the oxide film is a perfect insulator
 b. the oxide film is not a perfect insulator *
 c. the oxide film is a perfect conductor
 d. the oxide film is not a perfect conductor
77. The value of capacitor is generally specified in
 a. Farad only b. Microfarad only
 c. Picofarad only d. either b) or c) *
78. Other than electrolyte capacitor, as a general rule if a capacitor is marked using a whole number such as 33, 320, 680 etc. then the capacitance is in
 a. Farad b. Microfarad
 c. Nanofarad d. Picofarad*
79. In the film type capacitor, the first two numbers printed on the capacitor indicates
 a. the multiplier
 b. the tolerance
 c. the first two digits in the numerical value of capacitance *
 d. none of the above

80. In the film type capacitor, the third digit printed on the capacitor indicates
- the multiplier *
 - the tolerance
 - total capacitance value
 - either a) or b)
81. In the coding of film type capacitor, the letter in the extreme right indicates
- the multiplier
 - the tolerance *
 - the total value of capacitance
 - none of the above
82. In the coding of film type capacitor, when the digit for multiplier is 0, it indicates that the first two digits should be multiplied by
- 0
 - 1 *
 - 2
 - 10
83. In the disk ceramic capacitor coding system the capacitance is expressed
- as a whole number
 - as a decimal fraction
 - either a) or b) *
 - none of the above
84. Mica capacitors are coded using colour dots to indicate the capacitance value in
- microfarad
 - picofarad *
 - nanofarad
 - farad
85. The end electrode of chip capacitor is
- C shaped
 - V shaped
 - L shaped
 - Completely enclose the end of the part *
86. Tantalum capacitors are frequently coded to indicate their capacitance in
- picofarad *
 - nonfarad
 - microfarad
 - farad
87. Connecting capacitance in parallel is equivalent to
- adding the plate areas *
 - increasing the thickness of dielectric
 - decreasing the thickness of dielectric
 - either a) or b)
88. Connecting capacitance in series is equivalent to
- adding the plate areas
 - increasing the thickness of dielectric *
 - decreasing the thickness of dielectric
 - all the above
89. When two capacitors are connected in series, with equal charge, a smaller capacitance will have a
- lesser potential difference
 - greater potential difference *
 - nil potential difference
 - none of the above
90. Stray capacitive effect can occur in all circuits with all types of components and the typical values of stray capacitance is usually
- 1 to 10 microfarad
 - 50 to 100 microfarad
 - 1 to 10 picofarad *
 - 50 to 100 picofarad
91. For a circuit to reduce stray capacitance effect
- the wiring should be short with the leads and components placed high off the chassis *
 - the wiring should be long with the leads and component placed near the chassis
 - the wiring should be long with the leads and components placed high off the chassis
 - the wiring should be short with the leads and components placed near the chassis
92. A fully charged capacitor with perfect dielectric would keep its charge for :
- few hours
 - few days
 - few months
 - indefinitely *
93. Generally charge of a capacitor getting neutralised after a certain period because of
- perfect insulator
 - non - perfect insulator *
 - perfect metal plates
 - non - perfect metal plates
94. For paper, ceramic or mica capacitors, the leakage resistance is
- 10 megaohm or more
 - 20 megaohm or more
 - 50 megaohm or more
 - 100 megaohm or more *
95. The energy stored in a capacitor is equal to
- Cv^2J
 - $\frac{1}{2} Cv^2J$ *
 - $(1/3) Cv^2J$
 - $\frac{1}{4} Cv^2J$
96. Function of a battery in capacitor charging is
- to create electricity on plates
 - to cause the transfer of electrons from one plate to another
 - to create potential difference between the plates
 - both b) and c) *
97. Mica capacitors are very suitable for use
- as bypass and coupling capacitors
 - in smoothing circuits in radio work
 - short wave work in radio
 - at radio frequencies *
98. Ceramic capacitors are very suitable for use
- as bypass and coupling capacitors
 - in smoothing circuits in radio work
 - short wave work in radio *
 - at radio frequencies
99. Paper capacitors are very suitable for use
- as bypass and coupling capacitors *
 - in smoothing circuits in radio work
 - short wave work in radio
 - at radio frequencies

100. Electrolytic capacitors are very suitable for use
 a. as bypass and coupling capacitors
 b. in smoothing circuits in radio work *
 c. short wave work in radio
 d. at radio frequencies
101. The materials which are used for storing electrical energy are classified as _____ materials.
 a. insulating. b. dielectric.*
 c. super conducting. d. paramagnetic.
102. At very high frequency (of the order of 10 Hz) the permittivity of a dielectric is due to _____ polarisation.
 a. magnetic. b. ionic.
 c. electronic.* d. none of these.
103. Polar dielectrics are normally employed for
 a. dc and power frequencies.*
 b. microwaves.
 c. high frequencies.
 d. none of the above.
104. Which of the following dielectric is not preferred for high frequency applications ?
 a. Teflon. b. Butyl rubber.*
 c. Polystyrene. d. Polyethylene.
105. Which of the following is a polar dielectric ?
 a. Teflon. b. Polyethylene.
 c. Nylon.* d. Quartz.
106. Which of the following is a non-polar dielectric ?
 a. Polystyrene.* b. Castor oil.
 c. Phenolic plastics. d. None of these.
107. A good dielectric should have the properties of
 a. high resistance to thermal deterioration.
 b. high mechanical strength.
 c. freedom from gaseous inclusions.
 d. low dielectric loss.
 e. all of the above.*
108. The dielectric loss may increase due to
 a. increase in frequency of applied voltage.
 b. temperature rise.
 c. increase in voltage.
 d. presence of humidity.
 e. all of the above.*
109. The dielectric losses occur in all solid and liquid dielectrics due to
 a. hysteresis. b. conduction current.
 c. both (a) and (b) * d. none of these.
110. The dielectric power loss are given as _____ whereas C is the capacitance of dielectric, V is the applied voltage, f is the supply frequency and δ is dielectric loss angle.
 a. $p f C V^2 \tan \delta$ b. $2 p f C V^2 \tan \delta^*$
- c. $2 p f^2 C V \tan \delta$ d. $2 p f C^2 V \tan \delta$
111. Dielectrics have _____ free electron(s)
 a. a few. b. many.
 c. no * d. none of these.
112. Dielectrics materials are essentially _____ materials.
 a. insulating.* b. ferro-electric.
 c. ferri-magnetic. d. super conducting.
113. The moisture absorbed by an insulating material may result in
 a. decrease in volume resistivity, specially surface resistivity.
 b. decrease in dielectric strength due to change in field distribution within the insulating materials.
 c. decrease in dissipation factor.
 d. both (a) and (b).*
114. The behaviour of true dielectric is primarily
 a. electrostatic.* b. electro-magnetic.
 c. ferro-electric. d. none of these.
115. Displacement current leads the conduction current in lossy dielectric by
 a. 0° b. 90° *
 c. 135° d. 180°
116. For most of the solid dielectrics, the relative permittivity is
 a. less than 1. b. between 1 and 10.*
 c. more than 10. d. more than 2.5.
117. The dielectric susceptibility determines the value of
 a. dielectric strength.
 b. dielectric permittivity.*
 c. both (a) and (b).
 d. none of the above.
118. Ionization of dielectric causes
 a. thermal instability.
 b. a real power loss in insulation.
 c. lowering of breakdown voltage of the insulating material.
 d. carbonization, decomposition and mechanical damage to the insulation.
 e. all of the above.*
119. The dielectric strength value can be used in determination of
 a. uniformity of dielectric.
 b. effect of environmental and operating conditions.
 c. both (a) and (b).*
 d. none of these.
120. The protection against moisture can be provided by
 a. impregnation. b. hermetic sealing.
 c. both (a) and (b).* d. none of these.
121. The possible breakdown in solid dielectrics may be

- a. electro-thermal. b. electro-chemical. c. explosive. d. flammable.
 c. purely electrical. d. all of these.* e. both (a) and (b).*
122. The power arc following a flashover or the breaking of contacts over the insulation surface puts the surface to
 a. chemical action.
 b. extreme heat.
 c. deposition of electrode material.
 d. all of the above.*
123. Which one of the following insulating materials has least affinity to moisture?
 a. Mica.* b. Paper.
 c. Asbestos. d. Cotton.
 e. Rubber. f. Silk.
124. Insulation used in commutator is
 a. wood. b. PVC.
 c. mica.* d. glass.
125. Mica has
 a. very high dielectric strength.
 b. low dielectric loss.
 c. high mechanical strength.
 d. chemical stability and resistance to heat ageing.
 e. all of the above.*
126. The function of insulating oil is to provide
 a. electrical insulation. b. heat transfer.
 c. both (a) and (b).* d. none of these.
127. Insulating liquids are generally employed for potential stresses of upto
 a. 500 v/mm. b. 5 kv/mm.*
 c. 50 kv/mm. d. 500 kvmm.
128. Transformer oil is subjected to _____ test(s).
 a. moisture. b. acidity.
 c. dielectric strength. d. sludge resistance.
 e. all of the above tests.*
129. Sludge formation in insulating oil causes
 a. increase in an operating temperature.
 b. reduction in rate of heat transfer.
 c. clogging of ducts.
 d. all of the above.*
130. Presence of even a trace of water in transformer oil _____ its dielectric strength considerably.
 a. increases. b. reduces.*
 c. does not affect.
131. Which one of the following gases is classified as electro-generative ?
 a. Sulphur hexafluoride* b. Methane.
 c. Ethane. d. Nitrogen.
 e. Hydrogen.
132. Electro-generative gases are
 a. non-explosive. b. inflammable.
133. Dielectric strength of sulphur hexafluoride is about _____ times of that of air.
 a. 2.5 * b. 4.5
 c. 6.5 d. 7.5
134. Dielectric gas should have the property(ies) of
 a. high dielectric strength.
 b. good heat transfer. c. physiological inertness.
 d. all of the above.* e. both (a) and (b).
135. The dielectric strength of gaseous dielectrics depends on
 a. polarity of electrodes.
 b. pressure.
 c. frequency of applied field.
 d. uniformity of applied electric field.
 e. all of the above.*
136. Sulphur hexafluoride is used in
 a. power transformers.
 b. switch gears.*
 c. synchronous alternators.
 d. synchronous motors.
137. If the centre of gravity of the positive and negative charges in a body do not coincide in the absence of an applied electric field, the substance has an electric dipole moment and is said to be spontaneously polarised. Such a substance is known as
 a. ferro-electric.* b. dielectric.
 c. insulator. d. ferro-magnetic.
138. A ferro-electric material contains small regions which are polarised in different directions even in the _____ of an electric field.
 a. presence. b. absence.*
 c. either of the above. d. none of the above.
139. Which one of the following is a ferro-electric material?
 a. Stainless steel. b. Brass.
 c. Barium nitrate.* d. Wrought iron.
140. Which one of the following is not a ferro-electric material ?
 a. Y-alloy.* b. Rochelle salt.
 c. Lead zirconate. d. Boron nitride.
141. Materials having high dielectric constant, which is non-linear, are called the
 a. hard dielectrics. b. super dielectrics.
 c. ferro-electric materials* d. none of the above.
142. Ferro-electric materials are characterized by
 a. very high degree of polarization.
 b. a sharp dependence of polarization on temperature.
 c. non-linear dependence of the charge on the applied voltage.
 d. all of the above.*

C Sn	3.	7.22° K	c	1	4	2	3
	4.	3.73° K	d	1	4	3	2

Codes :	A	B	C*
a	1	2	3
b	1	3	4
c	2	3	4
d	1	2	4

162. List I (Alloy)
- A Stainless steel
 - B Bronze
 - C Constantan
 - D German silver
- List II (Constituent metals)
- 1. Copper and tin
 - 2. Copper and nickel
 - 3. Copper, zink and nickel
 - 4. Iron, chromium and nickel

158. List I (Materials)
- A Copper
 - B Silver
 - C Carbon
 - D Aluminium
- List II (Resistivity)
- 1. 1.6×10^{-8} W-m
 - 2. 1.78×10^{-8} W-m
 - 3. 2.8×10^{-8} W-m
 - 4. 1.1×10^{-4} W-m

Codes :	A	B	C	D
a	4	1	3	2
b	1	4	2	3*
c	4	1	2	3
d	3	1	2	4

Codes :	A	B	C	D
a	2	1	3	4
b	1	2	4	3*
c	2	1	4	3
d	1	2	3	4

163. List I (Alloy)
- A Gun metal
 - B Brass
 - C Manganin
 - D Nichrome
- List II (Composition)
- 1. Copper 60% and zinc 40%
 - 2. Copper 86% manganese 12% and nickel 2%
 - 3. Nickel 61%, chromium 15% and ferric 24%
 - 4. Copper 88%, tin 10% and zink 2%

Codes :	A	B	C	D
a	4	1	3	2
b	1	4	2	3
c	3	1	2	4*
d	4	1	2	3

159. List I (Materials)
- A Copper
 - B Carbon
 - C Mica
 - D Silicon steel
- List II (Type of material)
- 1. Magnetic material.
 - 2. Dielectric material.
 - 3. Conducting material.
 - 4. Semi-conductor.

Codes :	A	B	C	D
a	3	4	1	2
b	4	3	2	1
c	1	2	3	4*
d	3	4	2	1

164. List I (Components)
- A Structural components
 - B Frames of small and
 - C Frames of large
 - D Transformer tanks
- List II (Material used)
- 1. Cast iron
 - 2. Steel medium size
 - 3. Silicon steel size electric
 - 4. Tungsten steel (large size)

Codes :	A	B	C	D
a	1	1	2	2
b	3	1	2	4
c	3	1	4	2
d	1	3	2	4*

160. List I (Materials)
- A Carbon
 - B Nichrome
 - C Constantan
 - D Asbestos
- List II (Melting Point)
- 1. 1300° C
 - 2. 3500° C
 - 3. 1400° C
 - 4. 1500° C

Codes :	A	B	C	D
a	2	3	1	4
b	2	3	4	1
c	4	3	1	2
d	2	4	1	3*

165. List I (Materials)
- 1 Ferrits
 - 2 Diamagnetic materials
 - 3 Paramagnetic materials
 - 4 Ferro-magnetic materials
- List II (Relative permeability)
- 1 Very high
 - 2 Slightly less than unity.
 - 3 Zero
 - 4 Slightly more than unity

Codes:	A	B	C	D
a	1	2	3	4*
b	1	2	4	1

161. List I (Metal)
- A Constantan
 - B Tungsten
 - C Nichrome
 - D Manganin
- List II (Application)
- 1. Lamp filament
 - 2. Standard resistance coil
 - 3. Electric heater filament
 - 4. Rheostat

Codes :	A	B	C	D
a	4	1	2	3*
b	4	1	3	2

c	1	4	2	3
d	3	4	2	1

- | | | | |
|---|-----------|----|----------------|
| A | Asbestos | 1. | 10-20 kv/mm |
| B | Rubber | 2. | 6kv/mm |
| C | Porcelain | 3. | 3 to 4.5 kv/mm |
| D | Marble | 4. | 15 to 25 kv/mm |

166. List I (Materials)
 A MgO, Fe₂O₃
 B BaTiO₃
 C Cobalt
 D Copper
- List II (Classification)
 1. Piezoelectric material.
 2. Ferrimagnetic material
 3. Ferromagnetic material
 4. Diamagnetic material

Codes :

A	B	C	D
a	4	3	1
b	3	4	2
c	3	4	1
d	2	4	1

Codes :

A	B	C	D
a	2	3	4
b	2	1	3
c	1	2	4
d	1	2	3

167. List I (Class of insulation)
 A Y
 B F
 C B
 D C
- List II (Maximum operating temperature)
 1. 90°C
 2. 130°C
 3. 155°C
 4. more than 180°C

Codes :

A	B	C	D
a	3	1	2
b	1	3	4
c	1	3	2
d	4	2	3

168. List I (Class of insulation)
 A H
 B E
 C C
 D A
- List II (Maximum operating temperature)
 1. 105°C
 2. 120°C
 3. 180°C
 4. more than 180°C

Codes :

A	B	C	D
a	3	2	1
b	2	3	4
c	1	4	2
d	3	2	4

169. List I (Dielectric material)
 A Paper
 B Glass
 C Mica
 D bakelite
- List II (Dielectric strength)
 1. 40 to 80 kv/mm
 2. 4 to 10 kv/mm
 3. 5 to 15 kv/mm
 4. 20 to 25 kv/mm

Codes :

A	B	C	D
a	2	3	1
b	2	3	4
c	3	2	1
d	4	1	2

170. List I (Dielectric material)
 List II (Dielectric strength)

171. List I (Dielectric material)
 A Transformer oil
 B Glass
 C Mica
 D Air
- List II (Dielectric constant)
 1 3-8
 2 5-8
 3 1.0
 4 2.2

Codes :

A	B	C	D
a	3	4	2
b	1	4	2
c	4	1	3
d	4	1	2

172. List I (Dielectric material)
 A Bakelite
 B Rubber
 C Porcelain
 D Paper
- List II (Dielectric constant)
 1. 3-4
 2. 4-7
 3. 2.5
 4. 5-5.5

Codes :

A	B	C	D
a	4	1	2
b	4	1	3
c	1	4	2
d	3	2	4

True/False.

- Materials with BCC or FCC crystals are generally isotropic. (T)
- According to Rutherford's nuclear model an atom consists of a central positively charged nucleus of radius 10⁻¹¹ mm. (T)
- The drawbacks of Rutherford's model were overcome by proof Neil Bohr by applying Planck's quantum theory. (T)
- Isobars are the atoms which have same mass number but differ in atomic number. (T)
- A definite amount of energy is required to be spent in order to move an electron from its orbit. (T)
- Lattice parameter means dimensions of the unit cell in any of the crystallographic arrangements. (T)
- The crystals of most metals have a highly symmetrical structure with close packed atoms. (T)

8. A crystal is said to have a simple form if its all faces are similar. (T)
9. Atomic packing factor is defined as the ratio of the volume of atoms per unit cell to the total volume occupied by unit cell. (T)
10. Ionic bonds are uni-directional. (T)
11. At the most three electrons may occupy one energy level. (F)
12. A covalent bond is due to sharing of pair of valence electrons by two or more atoms. (F)
13. In the covalent bond, atoms of different elements transfer electrons from one to the other so that both have stable outermost orbits. (F)
14. It is the valence electrons that determine most of the properties of the elements and form bonds to hold the material together. (T)
15. High hardness and low conductivity are typical properties of ionic bond solids. (T)
16. Aluminium is easily solderable. (F)
17. Gold has resistivity lower than that of aluminium, but higher than that of silver. (T)
18. Silver alloys are widely employed for making contacts. (T)
19. Tin is employed in the manufacture of high current high voltage fuses. (T)
20. Electrical resistance of electrolytes generally increase with the increase in temperature. (F)
21. The best electrical conductors are also the best heat conductors. (T)
22. Copper can be converted into a super conductor at 0° K. (F)
23. All metals are conductors of electricity. (T)
24. Gold is the best conductor of electricity. (F)
25. Mechanical stressing of crystal structure reduces the resistivity of metal. (F)
26. Age hardening increases the conductivity of an alloy. (F)
27. Copper has high contact resistance. (F)
28. Copper loses its hardness abruptly at 200° C. (T)
29. Aluminium has low contact resistance. (F)
30. The transition from superconducting state to conducting state is irreversible. (F)
31. Annealed conductors are good conductors to electricity than a material subjected under sudden fall of temperature. (F)
32. Monovalent metals are not super-conducting. (T)
33. The transition temperature of super-conductors varies with the isotopic mass. (T)
34. Many metals have vanishing resistivity at absolute zero temperature. (T)
35. The metal and compounds which are superconducting are rather bad conductors at ordinary temperatures. (T)
36. Eureka is a copper nickel alloy. (T)
37. Cadmium bronze is used for contacting conductor and commutator segments. (T)
38. Bronze contains 60% copper and 40% zinc. (F)
39. Beryllium bronze may be employed for making current carrying springs. (T)
40. An alloy has higher conductivity than the pure base metal. (F)
41. Steel contains iron and small percentage of carbon. (T)
42. Platinum is corrodible material. (F)
43. Silicon and germanium are brittle, crystalline solids. (T)
44. The conductivity of a semiconductor material is usually high. (F)
45. Semiconductors are usually non-metallic in appearance. (F)
46. Germanium is a soft element. (F)
47. Germanium has a grey metallic lustre. (T)
48. Silicon carbide is extremely refractory. (T)
49. The fermi level lies very close to the conduction band in the case of intrinsic semiconductor. (F)
50. Silicon is the most important non-magnetic material alloyed with iron to improve magnetic properties. (T)
51. Magnetostriction shortens an iron bar while it elongates nickel. (F)
52. Ferrites are non-metallic ferromagnetic materials which essentially show exchange interaction of antiferromagnetic type. (F)

53. Non-magnetic materials do not represent to magnetic field. (T)
54. Materials are classified into diamagnetic, paramagnetic and ferromagnetic materials depending upon the manner in which they respond to electric current. (F)
55. If an external magnetic field is applied to a paramagnetic material it induces magnetization in the direction opposite to that of applied field. (F)
56. Ferromagnetism arises out of the electron structure. (T)
57. When a ferromagnetic material is magnetized its magnetic poles get oriented in the direction of coercive force. (F)
58. During the process of magnetization when all the magnetic dipoles of a magnetic material get oriented in one direction, the core is said to be grain oriented. (F)
59. Ferrimagnetic materials do not have permanent dipoles. (F)
60. Ferrites are widely employed in computers and microwave applications. (T)
61. Transverse magnetostriction is the change in dimension perpendicular to magnetization direction. (T)
62. When the crystals of a ferro-magnetic material are cold worked, the material has very poor magnetic properties. (T)
63. Grain orientation increases hysteresis loss in a magnetic material. (F)
64. High silicon steel has comparatively higher permeability and high saturation. (F)
65. Addition of 0.5 to 5% of silicon in iron causes increase in eddy current loss. (F)
66. CRGOS sheet steels are widely employed for construction of cores of rotating electrical machines. (F)
67. Grain orientation of silicon steel is obtained by annealing. (F)
68. Dielectric strength is the maximum voltage which when applied to an insulating material will cause serious damage to it and destruct to its insulating properties. (F)
69. Asbestos is used as an insulation in high voltage installations. (F)
70. Asbestos is neither mechanically strong nor flexible. (T)
71. Asbestos is least hygroscopic. (F)
72. Asbestos insulation is used at low temperature electrical installations. (F)
73. Fibre glass insulation is employed at low temperature electrical installations. (F)
74. Ceramic insulators have excellent insulating properties and impact strength. (F)
75. Cotton is non-hygroscopic. (F)
76. Paper is hygroscopic and absorbent. (T)
77. A plastic in a broad sense is defined as any non metallic material that can be moulded to shape. (T)
78. Mica is rigid, tough, strong and is not affected by moisture. (T)
79. Mica is not affected by oils. (F)
80. Bitumens and waxes are resinous insulating materials. (F)
81. Polarisation is a vector quantity.
82. Dipolar polarisation in solid and liquid dielectrics lowers the dielectric constants. (F)
83. The electrical conductivity of solid dielectrics is not affected by the presence of different impurities. (F)
84. In a solid dielectric electro-thermal breakdown causes its destruction due to heat produced by the dielectric losses. (T)
85. Capacitor with very high dielectric constants have been developed by treating BaTiO₃ in a reducing atmosphere. (T)
86. Dielectric constant of air decreases linearly with the increase in gas pressure. (F)
87. The dielectric strength of sulphur hexafluoride increases at increased pressure. (T)
88. Ferro-electric materials have a low dielectric constant. (F)
89. Higher the dielectric constant higher the dielectric strength. (F)
90. In ferro-electrics high electric field applied to a device cannot cause voltage breakdown. (F)
- Fill in the blanks**
- The excess of electrons produces a _____ charge on one side of a capacitor. (positive, **negative**, neutral)
 - If 6.25×10^{18} electrons are accumulated on negative side of the capacitor, then the negative charge equals _____. (1 amps, 1 herry, **1 coulomb**)
 - During charging of capacitor, the number of electrons accumulated on one plate is _____ as the number taken from the opposite plate. (more, less, **same**)

4. During charging of capacitor, the voltage source re-distribute some electrons from one side of capacitor to _____. (dielectric, battery terminal, **other side**)
5. When the capacitor is charged to the applied voltage, then there will be _____ current in the circuit. (maximum, little, **no**)
6. The measure of how much charge can be stored in a capacitor is called _____. (dielectric, electric field, **capacitance**)
7. More charge stored for a given amount of applied voltage means _____ capacitance. (**more**, less, no)
8. Components made to provide a specific amount of capacitance are called _____. (inductors, conductors, **capacitors**)
9. Electrically, capacitance is the ability to store _____. (voltage, current, **charge**)
10. Any voltage has a field of electric lines of force between the _____ electric charges. (same, **opposite**)
11. The capacitor has opposite charges because of _____ induction by the electric field. (electromagnetic, **electrostatic**, electropneumatic)
12. A capacitor is _____ with no charge. (negative, positive, **neutral**)
13. When a capacitor is charged, then there is electrostatic field in _____. (**dielectric**, plates, conducting wire)
14. The _____ charges have an associated potential difference. (similar, **opposite**)
15. During capacitor charging the dielectric is actually _____ by the invisible force of the electric field. (melted, broken, **stressed**)
16. By a very intense field with high voltage across capacitor the _____ can be ruptured. (plates, **dielectric**, conducting wire)
17. After charging of capacitor, the result of the electric field is that the dielectric has _____ supplied by the voltage source. (current, voltage, **charge**)
18. The charge remains in a charged capacitor even after the _____ is removed. (plate, dielectric, **voltage source**)
19. The action of neutralizing the charge by connecting a conducting path across the dielectric is called _____ the capacitor. (charging, **discharging**, aging)
20. If _____ is applied the capacitor would charge to 100 v. (200 v, 50 v, **100 v**)
21. No more charging current can flow when capacitor voltage is _____ to the applied voltage. (double, half, **equal**)
22. Any charge or discharge current of capacitor will not flow through _____. (plates, conducting wire, **dielectric**)
23. Electrolyte capacitor will allow current to flow through it in _____ direction. (both, **one**)
24. Capacitance of a capacitor varies _____ as the area of plates. (**directly**, inversely)
25. When two capacitors of equal rating are in series, the charges of two center plates will be _____. (same, **opposite**)
26. The charged capacitor serves as a _____ to produce electron flow around the discharge path. (voltage divider, voltage converter, **voltage source**)
27. More charge and discharge current of a capacitor results with a higher value of _____ for given amount of voltage. (resistance, inductance, **capacitance**)
28. More voltage produces _____ charge and discharge current with a given amount of capacitance. (less, minimum, **more**)
29. The value of capacitance _____ change with the voltage. (does, **does not**)
30. With more charging voltage, the electric field is stronger and _____ charge is stored in the dielectric. (**more**, less, minimum)
31. The amount of charge Q stored in the capacitance is proportional to the _____. (applied current, **applied voltage**, size of the plates)
32. When one coulomb is stored in the dielectric of a capacitor with a potential difference of one volt, then the capacitance is one _____. (microfarad, picofarad, **farad**)
33. Larger capacitor stores _____ charge for the same voltage. (less, **more**, minimum)
34. The result of larger plate area is _____ capacitance. (smaller, **larger**, same)
35. The electric field has greater flux density in the _____ dielectric. (thicker, **thinner**)
36. With less distance between the plates, the stored charge is _____ for the same applied voltage. (lower, **greater**, no change)

37. Dielectric constant indicates the ability of _____ to concentrate electric flux. (metal plate, conducting wire, **insulator**)
38. Mica has an average dielectric constant of 6, means it can provide a density of electric flux _____ times as great as that of air for the same applied voltage and equal size. (1/6, **6**, 3)
39. Higher values of dielectric constant allow _____ values of capacitance. (**greater**, lower, minimum)
40. The dielectric constant for an insulator is actually its _____. (strength, thickness, **relative permittivity**)
41. The physical factors for a parallel plate capacitor are summarized by the formula $C = K_E \times A/d \times 8.85 \times \text{_____}$ F. (10^{-9} , 10^{-6} , **10^{-12}**)
42. The ability of a dielectric to withstand a potential difference without arcing across the insulator is known as _____. (dielectric constant, **dielectric strength**, dielectric capacity)
43. Rapture of insulator provides a _____ path through the dielectric. (resistance, insulating, **conducting**)
44. Capacitor with higher voltage ratings have _____ distance between the plates. (less, minimum, **more**)
45. Commercial capacitors are generally classified according to the _____. (metal used in plates, **dielectric**, potential difference)
46. Electrolyte capacitors use a molecular-thin oxide film as the dielectric, resulting in _____ capacitance values in little space. (small, very small, **large**)
47. _____ capacitors are marked to indicate the side that must be connected to the positive or negative side of the circuit. (**electrolyte**,)
48. In mica capacitor, thin mica sheets as the _____ are stacked between tilfoil sections to provide the required capacitance. (plates, conducting wire, **dielectric**)
49. In a paper capacitor to take the advantage of shielding by the outside foil, the lead in which side white or bloak band is put is to be connected to _____ potential side of the circuit. (**low**, high)
50. Metalized type film capacitors are much _____ than foil type for a given capacitance value and breakdown voltage rating. (larger, **smaller**)
51. The metalized type film capacitor has much _____ plates than foil type film capacitor. (thicker, **thinner**)
52. In a metalized type film capacitor, if the dielectric is punctured due to exceeding its breakdown voltage rating, the capacitor is _____. (damaged permanently, **not damaged permanently**)
53. In a foil type film capacitor, if the dielectric is punctured due to exceeding its breakdown voltage rating, the capacitor is _____. (**damaged permanently**, not damaged permanently)
54. Film capacitors are used frequently in circuits that requires _____ capacitance values. (**stable**, unstable, both stable and unstable)
55. In radio frequency oscillators and timer circuits generally _____ capacitors are used. (mica, paper, **film**)
56. By using titanium dioxide or one of several types of silicates, _____ values of dielectric constant can be obtained. (low, medium, **very high**)
57. The wide range of values for ceramic capacitors is possible because the _____ can be tailored to provide almost any desired value of capacitance. (dielectric, dielectric strength, **dielectric constant**)
58. Surface mount capacitors or chip capacitors are normally used _____ dielectric. (mica, paper, **ceramic**)
59. In a variable capacitor, the capacitance is varied by rotating the _____. (body, dielectric, **shaft**)
60. When the rotor plates mesh fully with the stator plates in variable capacitor, the capacitance will be _____. (minimum, **maximum**)
61. When the rotor plates are completely out of mesh in a variable capacitor, the capacitance will be _____. (maximum, **minimum**)
62. In a electrolyte capacitor, which have a wide tolerance values the tolerance may be less on the minus side to make sure that there is enough _____. (dielectric constant, dielectric strngth, **capacitance**)
63. The rating which specifies the maximum potential difference that can be applied across the plates without punctuating the dielectric is known as _____ rating of capacitor. (current, power, **voltage**)
64. Higher temperature results in a _____ voltage rating of a capacitor. (higher, **lower**, no effect in)
65. For application, where a lower voltage rating is permissible, more capacitance can be obtained in a _____ physical size. (**larger**, medium, smaller)
66. A voltage rating _____ the potential difference

- applied across the capacitor provides a safety factor for long life in service. (**higher than**, lower than, same)
67. The breakdown rating of capacitor is _____ for ac voltage because of the internal heat produced by continuous charge and discharge. (higher, **lower**, equal)
68. In the aluminium foil type electrolytic capacitors the electrolyte used is _____. (sulphuric acid, potassium hydroxide, **borax**)
69. In a aluminium foil type electrolytic capacitor, when d.c. voltage is applied to form the capacitance in manufacture, the electrolytic action accumulates a molecular-thin layer of _____. (**aluminium oxide**, aluminium foil, aluminium hydroxide)
70. The oxide film of electrolytic capacitor is _____. (conductor, semi-conductor, **insulator**)
71. The body metal of aluminium foil type electrolyte capacitor can be used as a _____ terminal. (positive, **negative**)
72. Because of extremely thin dielectric film _____ capacitance values can be obtained in electrolytic capacitor. (Small, Very small, **very large**)
73. To form the oxide film in a electrolytic capacitor _____ voltage is required. (**dc**, ac, combination of dc and ac)
74. To eliminate the 60 or 120 Hz ac ripple in a dc power supply _____ capacitor is used. (paper, mica, **electrolytic**)
75. In the newer electrolytic capacitor of aluminium foil type, the leakage current is _____. (high, medium, **very small**)
76. Nonpolarized electrolytic capacitor can be used without any _____ polarizing voltage. (ac, **dc**)
77. A nonpolarized electrolytic capacitor actually contains _____ capacitors. (one, **two**, four)
78. Tantalum capacitors are having _____ leakage current than aluminium foil capacitors. (more, **less**, equal)
79. Tantalum oxide's dielectric constant is _____ than the aluminium oxide. (**higher**, lower, same)
80. Mica capacitors are coded using _____ to indicate the capacitance value. (digits, letters, **colour dots**)
81. In chip capacitor's coding system, the values of capacitance is represented in _____. (nanofarad, microfarad, **picofarad**)
82. When capacitors are connected in parallel, the total capacitance value is _____ individual capacitance. (less than the smallest, **sum of the**)
83. When capacitors are connected in series, the total capacitance value is _____ individual capacitance. (sum of the, **less than the smallest**)
84. Capacitors are used in series to provide a _____ working voltage rating for the combination. (**lower**, **higher**, same)
85. When two unequal capacitors are connected in series, the smaller capacitance will have _____ proportion of applied voltage. (smaller, **larger**, same)
86. The leakage resistance of mica capacitor is _____ the electrolytic capacitor. (**more than**, less than, same)
87. With a high frequency charging voltage applied to the capacitor, there may be a difference between the amount of ac voltage applied and the ac voltage stored in dielectric and this difference can be considered hysteresis loss in _____. (plate, conducting wire, **dielectric**)
88. Hysteresis loss in dielectric is _____ with increased frequency. (**increased**, decreased, remain same)
89. The quality of a capacitor in terms of minimum loss is often indicated by its _____ (capacitance, voltage rating, **power factor**)
90. The quality of capacitor will be better if the numerical value of power factor is _____. (higher, **lower**, very higher)
91. If the Q of a capacitor is _____ than that capacitor's quality is better. (lower, **higher**, very lower).
92. Mica and ceramic capacitors have _____ leakage resistance value. (high, **very high**, very little)
93. The insulation resistance of a cable capacitor is _____ proportional to the cable length. (directly, **inversely**)
94. On discharging the capacitor, the _____ collapses and the stored energy is released. (dielectric, plates, **electrostatic field**)
95. During charging of a capacitor the charging current is _____ at start. (minimum, **maximum**)
96. During discharging of a capacitor, the discharging current is _____ at start. (minimum, **maximum**)
97. The magnitude of the leakage current of a capacitor is

- depends upon the _____ of the dielectric.
(strength, dielectric constant, **insulation resistance**)
98. In a crystal, the arrangement of atoms is in periodically _____ pattern. (**repeating**)
99. Secondary bonds are _____ than primary bonds. (**weaker**)
100. The addition of small amounts of impurity may _____ the resistivity considerably. (**increase**)
101. Pure aluminium is _____ than copper. (**softer**)
102. Aluminium has relatively _____ thermal and electrical conductivities. (**low**)
103. Boiling point of mercury is _____. (**357°**)
104. Bronze has _____ resistivity than that of copper. (**higher**)
105. High resistance materials have high _____. (**resistivity**)
106. Tungsten is used in lamp due to _____. (**its high melting point**)
107. A voltage (maximum) of _____ volt per turn should be used when designing constantan wire rheostats. (**1**)
108. Platinum does not _____ in air. (**oxidise**)
109. With increase of temperature the resistivity of a metal _____ while the conductivity of a semiconductor _____. (**increases, increases**)
110. Resistivity of ferrites ranges from _____ to _____ ohm-m. (**0.1, 10**)
111. The resistivity of ferrites is very much _____ than that of the ferro-magnetic materials. (**higher**)
112. The majority carriers are _____ in n-type semiconductor, while the minority carriers are _____ in p-type semiconductor. (**electrons, electrons**)
113. The conductivity of intrinsic semiconductor is primarily dependent on _____ mobility and _____ mobility. (**electron, hole**)
114. A reverse biased P-N junction diode operating on the breakdown phenomenon is called a _____. (**zener diode**)
115. Barium titanate has _____ crystal structure and is a _____ material. (**an unsymmetrical, piezo-electric**)
116. Core of electrical machine is of _____. (**silicon steel**)
117. Diamagnetic materials are _____ materials. (**non-magnetic**)
118. Above the _____ temperature, the domains may disrupt and the material may lose its ferro-magnetic properties. (**curie**)
119. When a paramagnetic material is placed in a magnetic field, the field distortion is _____. (**negligible**)
120. In hard magnetic materials the coercive force is _____. (**large**)
121. In hard magnetic materials it is _____ to orient the domains in comparison to the soft magnetic materials. (**difficult**)
122. Hard magnetic materials have _____ magnetic reluctance. (**high**)
123. Alnico is _____ than Alni. (**more expensive**)
124. Silk resins possess _____ electrical insulating properties. (**good**)
125. Silicon rubbers have _____ electrical insulating properties. (**high**)
126. Silk is _____ hygroscopic and has _____ dielectric strength in comparison to those for cotton. (**less, higher**)
127. Electronic polarisation is _____ pronounced in liquid and solid dielectrics than in gas. (**more**)
128. Ferro-electric materials exhibit _____ loops. (**more**)



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CHAPTER - 8

KNOWLEDGE OF THE CONSTRUCTION, PRINCIPLE OF OPERATION AND CHARACTERISTICS OF DC GENERATORS AND MOTORS

- Whenever a conductor cuts magnetic flux, dynamically induced emf is produced in it according to
 - Lenz's law
 - Faraday's laws of electromagnetic induction *
 - Ohm's law
 - Kirchoff's law
- The basic essential parts of an electrical generator are
 - magnetic field
 - conductors
 - electrolyte
 - both a) and b)
- The two ends of an armature coil of a generator are joined to
 - two magnets
 - two sliprings *
 - two brushes
 - none of the above
- The function of brushes in a generator is to collect the current induced in the coil and convey it to
 - field magnets
 - armature
 - sliprings
 - external loads *
- When a coil is rotating in a magnetic field, an emf is induced in it which is proportional to the
 - field intensity
 - magnetic potential
 - rate of change of flux linkages *
 - both a) and b)
- The direction of induced emf in a generator can be found by
 - fleming's right hand rule *
 - fleming's left hand rule
 - faraday's law
 - lenz's law
- In the armature of a dc generator, the nature of induced current is
 - alternating *
 - direct
 - both a) and b)
 - none of the above
- Mechanical support for the poles in a dc generator is provided by
 - armature core
 - armature winding
 - commutator
 - yoke *
- The magnetic flux produced by the poles of a generator is carried by
 - armature core
 - yoke *
 - armature winding
 - brushes
- The yoke of a generator is generally made of
 - cast iron
 - cast steel
 - rolled steel
 - all the above *
- The purpose of pole shoes in a generator is to
 - spread out flux in the air gaps
 - reduce the reluctance of the magnetic path
 - support the exciting coils
 - all the above *
- In a generator, the exciting pole coils are being supported by
 - yoke
 - pole cores
 - pole shoes *
 - armature core
- The purpose of using lamination in the armature core of a generator is to reduce the loss due to
 - hysteresis
 - eddy current *
 - load imbalance
 - none of the above
- Conversion of alternating current, induced in the armature of a generator, into unidirectional current is done by
 - brush
 - sliprings
 - commutator *
 - all the above
- The commutator segments of a generator are insulated from each other by thin layers of
 - rubber
 - glass
 - mica *
 - wood
- Each commutator segment of a generator is connected to armature conductor by means of
 - copper lug *
 - chromium lug
 - tungsten lug
 - carbon lug
- The brush gear of a generator is made up by
 - brush yoke
 - brush holders
 - brushes
 - all the above *
- The bearings which are normally used for heavy duty generator is
 - ball bearings
 - roller bearings *
 - sleeve bearings
 - none of the above
- In the wave winding of armature, the armature

- conductors are divided into
- two parallel paths *
 - three parallel paths
 - four parallel paths
 - ten parallel paths
- If a 4 pole, wave wound generator is having 30 armature conductors, then each of path will have
 - 5 conductors
 - 10 conductors
 - 15 conductors *
 - 3 conductors
 - In the lap winding of armature, the armature conductors are divided into
 - 2 parallel paths
 - 4 parallel paths
 - 8 parallel paths
 - as many as the number of poles *
 - In a 4 pole dc generator, if the armature is lap winding, then the number of parallel path for armature conductor will be
 - 2
 - 4 *
 - 6
 - 8
 - Resistance of the whole winding of the armature can be calculated from
 - $R = (L/\rho S) \times Z$
 - $R = (\rho L/S) \times Z$ *
 - $R = (\rho S/L) \times Z$
 - $R = (\rho S/ZL)$
 - Resistance of each parallel path of an armature winding can be calculated from
 - $\rho LZ / SA$ *
 - $\rho L / ZSA$
 - $\rho LA / ZS$
 - $\rho A / ZSL$
 - When field magnets of a generator is energized by an independent external source, then that generator is known as
 - self excited generator
 - separately excited generator *
 - either a) or b)
 - none of the above
 - In a self excited generator there will be always some flux present in pole because of
 - high voltage of generator
 - low voltage of generator
 - high current
 - residual magnetism *
 - When the field windings of a self excited generator is connected across the armature conductor, then that generator is known as
 - shunt wound *
 - series wound
 - compound wound
 - none of the above
 - The field windings of a shunt wound generator normally
 - carry the full load current
 - have full voltage of generator *
 - both a) and b)
 - none of the above
 - The field coil of shunt wound generator consists of
 - many turns of copper strips
 - few turns of copper strips
 - few turns of fine gauge copper wire
 - many turns of fine gauge copper wire *
 - The field windings of a series wound generator normally
 - carry the full load current *
 - have full voltage of generator
 - both a) and b)
 - none of the above
 - The field coil of series wound generator consists of
 - many turns of copper strips
 - few turns of copper strips *
 - few turns of fine gauge copper wire
 - many turns of fine gauge copper wire
 - In a compound wound generator, when the shunt winding is connected across the armature, then it is called
 - short shunt compound generator *
 - long shunt compound generator
 - series compound generator
 - none of the above
 - In a compound wound generator, when the shunt winding is connected across the armature and series windings, then it is called
 - short shunt compound generator
 - long shunt compound generator *
 - series compound generator
 - none of the above
 - Hysteresis loss of a generator is
 - iron loss *
 - copper loss
 - mechanical loss
 - all the above
 - Hysteresis loss of a generator occurred due to
 - cutting of flux by the armature core
 - armature copper loss
 - friction at bearings
 - reversal of magnetism of the armature core *
 - If P is the number of poles and N is the armature speed in rpm, then frequency of magnetic reversal of an armature core is equal to
 - $(N / 120 P)$ reversals / second
 - $(P / 120 N)$ reversals / second
 - $(PN / 120)$ reversals / second *
 - $120 PN$ reversals / second
 - The hysteresis loss of a generator depends upon
 - volume of grade of iron
 - maximum value of flux density
 - frequency of magnetic reversals
 - all the above *
 - When the armature core of a generator rotates an emf is induced in the body of the core because of

- a. mutual induction from armature windings
b. mutual induction from field winding
c. it also cuts the magnetic flux *
d. none of the above
39. In a generator, the eddy current flow will occur when an emf is induced in
a. armature core * b. armature windings
c. field windings d. magnetic poles
40. The armature core laminations are insulated from each other by
a. thin mica b. thin rubber
c. thin glass d. thin coating of varnish*
41. Special silicon steels are generally preferred for making armature core of a generator, because of their
a. low hysteresis coefficient and high resistivity *
b. high hysteresis coefficient and high resistivity
c. low hysteresis coefficient and low resistivity
d. high hysteresis coefficient and low resistivity
42. The total copper losses of a dc generator is equal to
a. armature copper losses
b. shunt copper losses
c. series copper losses
d. all the above *
43. The armature copper losses of a dc generator is about
a. 10 to 20 % of full load losses
b. 20 to 30 % of full load losses
c. 30 to 40 % of full load losses *
d. 40 to 50 % of full load losses
44. The field copper loss of a dc generator is practically constant for
a. series wound generator
b. shunt wound generator
c. compound wound generator
d. both b) and c) *
45. The field copper losses of a dc generator is about
a. 10 to 20 % of full load losses
b. 20 to 30 % of full load losses *
c. 30 to 40 % of full load losses
d. 40 to 50 % of full load losses
46. Mechanical losses of a dc generator is consists of
a. friction loss at bearings and commutator
b. air - friction or windage loss of rotating armature
c. hysteresis loss
d. both a) and b) *
47. The mechanical losses of a dc generator is about
a. 10 to 20 % of full load losses *
b. 20 to 30 % of full load losses
c. 30 to 40 % of full load losses
d. 40 to 50 % of full load losses
48. In case of a shunt and compound wound generator, the losses which are constant is
- a. stray losses
b. shunt copper losses
c. armature copper losses
d. both a) and b) *
49. The mechanical efficiency of a generator is denoted by
a. $[(\text{total watts generated in armature}) / (\text{mechanical power supplied})]$ *
b. $[(\text{watts available in load circuit}) / (\text{total watts generated})]$
c. $[(\text{watts available in load circuit}) / (\text{mechanical power supplied})]$
d. none of the above
50. The electrical efficiency of a generator is denoted by
a. $[(\text{total watts generated in armature}) / (\text{mechanical power supplied})]$
b. $[(\text{watts available in load circuit}) / (\text{total watts generated})]$ *
c. $[(\text{watts available in load circuit}) / (\text{mechanical power supplied})]$
d. none of the above
51. The overall or commercial efficiency of a generator is denoted by
a. $[(\text{total watts generated in armature}) / (\text{mechanical power supplied})]$
b. $[(\text{watts available in load circuit}) / (\text{total watts generated})]$
c. $[(\text{watts available in load circuit}) / (\text{mechanical power supplied})]$ *
d. none of the above
52. Unless specified, other wise the efficiency of a generator always to be understood as
a. mechanical efficiency
b. electrical efficiency
c. commercial efficiency *
d. either a) or b)
53. The overall efficiency of a generator is equal to
a. mechanical efficiency
b. mechanical electrical efficiency
c. mechanical efficiency x electrical efficiency *
d. none of the above
54. The effect of magnetic field set up by armature current on the distribution of flux under main poles of a generator, is known as
a. field reaction b. armature reaction *
c. commutation d. none of the above
55. The effect of armature field on the distribution of flux of a dc generator is
a. it demagnetises main pole flux
b. it distorts the main flux
c. it strengthen the main pole flux
d. both a) and b) *
56. When the load on the generator is increased, the

- 'demagnetising component' of armature reaction will
 a. increase * b. remain same
 c. decrease d. either b) or c)
57. The demagnetising component of armature reaction may become so strong as to reverse the polarity of the main poles, if the generator become
 a. severely overloaded b. short circuited
 c. open circuited d. either a) or b) *
58. The de - magnetising effect of armature reaction is neutralized by
 a. compensating winding
 b. interpoles
 c. adding a few extra ampere - turns to the main field winding *
 d. both a) and b)
59. The distorting effect of armature reaction is neutralized by
 a. compensating winding
 b. interpoles
 c. adding a few extra ampere - turns to the main field winding
 d. both a) and b) *
60. Copensating windings in a dc generator are connected in such a way that current in them flows in a direction
 a. same to that of the armature current
 b. opposite to that of the armature current *
 c. either a) or b)
 d. none of the above
61. If commutation period is prolonged in a dc generator then sparking will occur between
 a. armature coil and armature core
 b. pole coil and pole shoe
 c. brush and commutator *
 d. both a) and b)
62. Commutation can be improved in a dc generator by using
 a. compensating windings
 b. a few more ampere - turn in field coil
 c. interpoles *
 d. all the above
63. Interpoles in a dc generator are wound with a
 a. many turns of thin copper wire
 b. few turns of thin copper wire
 c. many turns of thick copper wire
 d. few turns of thick copper wire *
64. Interpoles in a dc generator are connected with armature in
 a. series * b. parallel
 c. series parallel d. either b) or c)
65. The open circuit characteristic of a dc generator shows the relation between
 a. no load generated emf in armature and exciting current *
 b. emf actually induced in armature and armature current
 c. terminal voltage and load current
 d. none of the above
66. The internal or total characteristic of a dc generator shows the relation between
 a. no load generated emf in armature and exciting current
 b. e.m.f. actually induced in armature and armature current *
 c. terminal voltage and load current
 d. none of the above
67. The designer of generator mainly having interest on
 a. open circuit characteristic of generator
 b. internal characteristic of generator *
 c. external characteristic of generator
 d. none of the above
68. The external characteristic of a dc generator shows the relatin between
 a. no load generated emf in armature and exciting current
 b. emf actually induced in armature and armature current
 c. terminal voltage and load current *
 d. none of the above
69. The external characteristic of a dc generator is also referred to as
 a. performance characteristic
 b. voltage regulation curve
 c. total characteristic
 d. both a) and b) *
70. To find out the open circuit characteristic of generator, the field winding of generator is to be
 a. connected with a series resistance
 b. connected with a parallel resistance
 c. removed and connected to a separate dc source *
 d. noen of the above
71. The magnetic path in a dc generator lies
 a. through air
 b. through iron
 c. partly through air and partly through iron *
 d. none of the above
72. A series generator will build up the voltage only when the total circuit resistance is
 a. equal to the critical resistance
 b. less than the critical resistance *
 c. more than the critical resistance
 d. none of the above
73. In a series generator, the mutual reinforcement of induced emf, exciting current and flux takes place only when the critical resistance is

- a. equal to the total circuit resistance
b. less than the total circuit resistance
c. more than the total circuit resistance *
d. none of the above
74. When the load current of a series generator is increased, then the voltage of the generator will be
a. decreased b. increased *
c. remain same d. none of the above
75. In electrical supply system, the voltage in the consumer end, can be maintained constant by the use of
a. series generator * b. shunt generator
c. compound generator d. all the above
76. In electrical supply system, series generators can be used as a booster and they should supply a voltage, which is
a. equal to the supply voltage
b. half of the supply voltage
c. equal to the line voltage drop *
d. none of the above
77. If the shunt field resistance of a shunt generator is greater than its critical resistance then the generator will
a. excite very slowly b. excite very quickly
c. fail to excite * d. either a) or b)
78. The condition for a shunt generator to build up voltage is
a. poles should have residual magnetism
b. field coils should be connected to armature correctly
c. field resistance should be less than critical resistance
d. all the above *
79. In a compound - wound generator, when the series field current is such that it causes the full load terminal voltage to be about the same as the no load voltage, the generator is said to be
a. flat compounded * b. over - compounded
c. under compounded d. none of the above
80. In a compound wound generator, if the full load voltage is greater than the no load voltage, the generator is said to be
a. flat compounded b. over compounded *
c. under compounded d. none of the above
81. In a compound - wound generator, if the full load voltage is lesser than the no load voltage, then the generator is said to be
a. flat compounded b. over compounded
c. under compounded * d. none of the above
82. The generator which can be used to compensate for the voltage drop in a feeder system is
a. shunt generator
b. series generator
c. over - compounded generator *
d. under compounded generator
83. The direction of rotation of a motor is given by
a. Flemings right hand rule
b. Flemings left hand rule *
c. Faraday's law
d. Lenz's law
84. In a generator, the necessary opposition for energy conversion is provided by
a. Magnetic drag * b. Back emf
c. Friction d. Both a) and b)
85. In a motor, the necessary opposition for energy conversion is provided by
a. Magnetic drag b. Back emf *
c. Friction d. Both a) and b)
86. The direction of back emf in a dc motor is
a. Same to the direction of applied voltage
b. Opposite to the direction of applied voltage *
c. Either a) or b)
d. None of the above
87. In a motor the back emf is equal to
a. $\phi z N \times \left(\frac{A}{P}\right)$ volts b. $\phi z A \times \left(\frac{N}{P}\right)$ volts
c. $\phi N P \times \left(\frac{A}{N}\right)$ volts d. $\phi z N \times \left(\frac{P}{A}\right)$ volts *
88. The mechanical power developed by a motor is maximum, when the back emf is equal to
a. the applied voltage
b. half of the applied voltage *
c. one - third of the applied voltage
d. one fourth of the applied voltage
89. The speed of a d.c. motor is
a. directly proportional to back emf and flux
b. inversely proportional to back emf and flux
c. directly proportional to back emf and inversely proportional to flux *
d. directly proportional to flux and inversely proportional to back emf
90. The term speed regulation refers to the change in the speed of a motor with change in
a. applied voltage b. applied flux
c. applied load torque * d. none of the above
91. Speed regulation of a dc motor is the change in speed due to
a. inherent properties of motor itself *
b. incorporation of rehostats
c. incorporation of other speed controlling devices
d. all the above
92. Percentage speed regulation of dc motor is equal to

- a. $\frac{\text{No load speed} + \text{full load speed}}{\text{full load speed}} \times 100$
- b. $\frac{\text{No load speed} - \text{full load speed}}{\text{full load speed}} \times 100$ *
- c. $\frac{\text{full load speed} - \text{no load speed}}{\text{no load speed}} \times 100$
- d. $\frac{\text{no load speed} - \text{full load speed}}{\text{no load speed}} \times 100$
93. The electrical characteristics of a dc motor is having the relation with
- torque and armature current *
 - speed and armature current
 - speed and torque
 - all the above
94. The mechanical characteristic of a dc motor is having the relation with
- torque and armature current
 - speed and armature current
 - speed and torque *
 - none of the above
95. Prior to magnetic saturation, on heavy loads, a series motor exerts a torque proportional to the
- armature current
 - square of the armature current *
 - half of the armature current
 - one - fourth of the armature current
96. A series motor should never be started
- without some mechanical load *
 - with some mechanical load
 - either a) or b)
 - none of the above
97. A dc shunt motor should never be started
- with load *
 - without load
 - either a) or b)
 - none of the above
98. When a dc shunt motor is changing from no load to full load, the speed of the motor will have
- much less speed
 - excessive high speed
 - no appreciable change *
 - none of the above
99. A dc shunt motor is normally used
- for heavy loads
 - where a heavy starting torque is required
 - where constant speed is required *
 - all the above
100. The dc motor which can develop a high torque with sudden increase in load is
- Series motor
 - shunt motor
 - cumulative compound motor *
 - differential compound motor
101. Cumulative compound dc motors are used where
- heavy starting torque is required
 - the load is likely to be removed totally
 - constant speed is required
 - both a) and b) *
102. In a differential cumulative dc motor the motor torque
- increases very slightly with increase in speed *
 - increases very rapidly with increase in speed
 - decreases very slightly with increase in speed
 - decreases very rapidly with increase in speed
103. The characteristic of shunt motor is
- speed is sufficiently constant
 - starting torque is medium
 - speed is high at low loads and low at high load
 - both a) and b) *
104. When it is required to drive the load at various speeds and any one speed being kept constant for a relatively long period, the motor used is
- shunt motor *
 - series motor
 - cumulative - compound motor
 - differential compound motor
105. For machine tools the motor used is
- cumulative compound motor
 - differential compound motor
 - series motor
 - shunt motor *
106. For driving cranes, the motor used is
- series motor *
 - shunt motor
 - cumulative compound motor
 - differential compound motor
107. The characteristic of series motor is
- having relatively huge starting torque
 - speed is high at low loads and low at high load
 - speed is sufficiently constant
 - both a) and b) *
108. If consistency of speed is not essential, then the motor which is preferably used is
- shunt motor
 - series motor *
 - cumulative compound motor
 - differential compound motor
109. The characteristic of cumulative compound motor is
- variable speed
 - high starting torque
 - constant speed
 - both a) and b) *
110. For heavy machine tools the motor used is
- shunt motor
 - series motor

- c. cumulative compound motor *
d. differential compound motor
111. The losses taking place in a dc motor is
a. copper losses b. magnetic losses
c. mechanical losses d. all the above *
112. The maximum efficiency from a dc motor is obtained when
a. copper losses are half of the constant losses
b. copper losses are one fourth of the constant losses
c. copper losses are equal to the constant losses *
d. copper losses are double to the constant losses
113. Commercial efficiency of a dc motor is the ratio of
a. motor out put to motor input *
b. driving power in armature to motor input
c. motor output to driving power in armature
d. none of the above
114. Mechanical efficiency of a dc motor is the ratio of
a. motor output to motor input
b. driving power in armature to motor input
c. motor output to driving power in armature *
d. none of the above
115. The opening and closing of a valve by an actuator is done by
a. Reversing the direction of current flow
b. Reversing the magnetic field polarity
c. Both a) and b) *
d. None of the above
116. The opening and closing of a valve by an actuator is done by reversing the direction of current flow and magnetic field polarity in
a. field windings b. armature
c. Both a) and b) d. either a) and b) *
117. The method for reverse operation of dc series motor, commonly adopted is
a. Armature winding is split into two electrically separate sections
b. Field winding is split into two electrically separate section *
c. Both a) and b)
d. None of the above
118. For compound wound motor the method normally adopted for reversing of motor is
a. Splitting armature winding
b. Splitting field winding
c. Interchanging the armature connections *
d. none of the above
119. For lowering and raising of an aircraft's landing flaps, the motor normally used is
a. reversible series motor
b. reversible shunt motor
c. reversible compound wound motor *
d. all the above
120. Electrical actuators are self - contained units which are consists of
a. electrical devices only b. mechanical devices only
c. both a) and b) * d. none of the above
121. Types of actuator which are normally in use are
a. linear actuator b. rotary actuator
c. both a) and b) * d. none of the above
122. Linear and rotary actuators are normally powered by
a. dc motors only b. ac motors only
c. both ac and dc motors* d. none of the above
123. The extension and retraction of a linear actuator is achieved by the action of a
a. screw thread b. ball bearing thread
c. commutator d. either a) or b) *
124. In the ball bearing method for extension and retraction of linear actuator, the conventional male and female threads are replaced by
a. One semicircular helical groove
b. Two semi circular helical grooves *
c. Three semicircular helical grooves
d. Four semicircular helical grooves
125. Rotary actuators are normally used in components, the mechanical elements of which are required to be rotated
a. at high speed
b. at low speed
c. through limited angular travel
d. both b) and c) *
126. In fuel cock of an aircraft, the actuator which is normally used is
a. linear actuator b. rotary actuator *
c. both a) and b) d. none of the above
127. In an actuator, when the operating cam has reached the permissible limit of travel, then the type of switch used to stop the motor is
a. pressure switch b. thermal switch
c. proximity switch d. micro switch *
128. The operating solenoid of brakes of an actuator is connected
a. in series with armature *
b. in series with field
c. in parallel with armature
d. in parallel with field
129. The mechanism incorporated in an actuator to protect it from effects of mechanical overloading is known as
a. brakes b. clutches *
c. micro switches d. lead screws
130. The frequency which has been adopted as the standard for aircraft constant frequency system is
a. 50 Hz b. 120 Hz
c. 400 Hz * d. 600 Hz

131. The maximum output of an ac generator in kw for a specification of 40 KVA of 0.8 P. F. will be :
- 40 kw
 - 20 kw
 - 28 kw
 - 32 kw *
132. When the frequency of a generator voltage output is permitted to vary with the rotational speed, then that system is known as
- frequency - wild system *
 - frequency stable system
 - constant frequency system
 - none of the above
133. The output of frequency wild generator can be directly applied to
- resistive load circuit
 - inductive load circuit *
 - capacitive load circuit
 - all the above
134. For the supply of heating current to a turbo propeller engine de - icing system, the generator used is
- constant frequency generator
 - frequency - wild generator *
 - shunt generator
 - series generator
135. The a.c. generator used for heating the turbo propeller engine de - icing system, is having the frequency range of
- 50 to 120 Hz
 - 60 to 120 Hz
 - 100 to 400 Hz
 - 280 to 400 Hz *
136. In the frequency wild generator the current is induced in
- fixed stator assembly *
 - rotor assembly
 - both a) and b)
 - noen of the above
137. The drive to the frequency - wild generator is given by
- a dc motor
 - an ac motor
 - engine driven accessory gear box *
 - none of the above
138. The frequency - wild ac generator is having
- 2 poles
 - 4 poles
 - 6 poles *
 - 16 poles
139. The total number of brushes fitted in a frequency wild ac generator is
- 4
 - 6 *
 - 8
 - 10
140. To suppress interference in the reception of radio signals in a frequency wild generator capacitors are used, which are connected between
- Phase and neutral terminal
 - terminal and brush
 - slipring and brush
 - terminal and frame *
141. For an over heat warning requirement in a frequency wild generator, provision is made for installing a
- pressure switch
 - thermally - operated switch *
 - toggle switch
 - proximity switch
142. A constant frequency is inherent in an ac system if the generator is
- having a large number of poles
 - having less number of poles
 - having a large armature
 - driven at a constant speed *
143. A constant speed drive unit is generally consist of
- a variable displacement hydraulic unit
 - a fixed displacement hydraulic unit
 - a differential gear
 - all the above *
144. The cylinder block of the variable displacement unit of C. S. D., is always rotates at a speed proportional to
- input gear speed *
 - output gear speed
 - either a) or b)
 - none of the above
145. The generator develop an electric pressure by
- conversion of heat.
 - conversion of light.
 - electro-magnetic induction.*
 - conversion of chemical energy.
146. The dc generator works on the principle of
- Flaming's left hand rule.
 - Flaming's right hand rule.*
 - Lenz's law.
 - none of these.
147. Which device illustrates the principle of electric-mechanical conversion ?
- Amplifier.
 - Battery charger.
 - Transformer.
 - Electric bell.*
148. Flaming's left hand rule is applicable to
- dc generator.
 - dc motor.*
 - alternator.
 - transformer.
149. A circular metallic disc is placed in a vertical magnetic field of constant induction in the downward direction. If the disc is rotated in a horizontal plane, the emf induced will be
- zero.*
 - constant independent of disc size.
 - increasing radially in the outward direction.
 - decreasing radially in the outward direction.
150. EMF induced in each conductor of a dc machine is
- an alternating emf.*
 - a direct emf.
 - a pulsating emf.
 - emf of random waveshape.

151. The nature of current flowing in the armature of a dc machine is
 a. ac.*
 b. dc.
 c. pulsating.
 d. dc superimposed over ac.

152. An emf is induced in the armature winding of a dc generator when it rotates in
 a. electro-magnetic flux.
 b. electro-static field.
 c. magnetic field.*
 d. alternating magnetic flux.

153. A conductor is rotating within a magnetic field. At which of the positions shown in the fig do the zero voltages occur ?

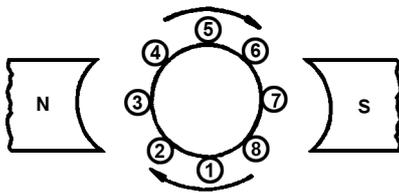


Fig. 1

- a. 1 and 5.* b. 2 and 6.
 c. 3 and 7. d. 4 and 8.

154. A conductor is rotating within a magnetic field. At which of the positions do the peak voltages occur?
 a. At right angles to the axis of magnetic field.
 b. Along the axis of the magnetic field.*
 c. At 45° angles of the axis of magnetic field.
 d. Anywhere.

155. Emf induced in a coil, when rotating in a uniform magnetic field will be maximum when the coil is
 a. perpendicular to the magnetic field.
 b. parallel to the magnetic field.*
 c. 45° to the magnetic field.
 d. achieving uniform speed.

156. EMF induced in a coil rotating in a uniform magnetic field will be maximum when the
 a. flux linking with the coil is maximum.
 b. rate of change of flux linkage is minimum.
 c. rate of change of flux linkage is maximum.*
 d. rate of cutting flux by the coil sides is minimum.

157. A short-circuited rectangular coil falls under gravity with the coil remaining in a vertical plane and cutting perpendicular horizontal magnetic lines of force. It has _____ acceleration.
 a. zero. b. increasing.
 c. decreasing. d. constant.*

158. Reluctance torque in rotating machines is present, when
 a. airgap is not uniform.
 b. reluctance seen by stator mmf varies.
 c. reluctance seen by rotor mmf varies.

- d. reluctance seen by the working mmf varies.*

159. Rotational losses in electrical machines consist of
 a. friction and windage losses.*
 b. stator core, friction and windage losses.
 c. rotor core, friction and windage losses.
 d. stray load losses and friction and windage losses.

160. If a current carrying coil is placed in a uniform magnetic field with its plane perpendicular to the direction of magnetic induction, then
 a. the net force and torque on the coil are both zero*
 b. the net force is zero but torque is finite.
 c. the net force is finite but torque is zero.
 d. the net force and torque are both finite.

161. The developed electro-magnetic force and/or torque in electro-mechanical energy conversion system act in a direction that tends
 a. to increase the stored energy at constant emf.
 b. to decrease the stored energy at constant flux.*
 c. to decrease the co-energy at constant mmf.
 d. to decrease the stored energy at constant mmf.

162. Neglecting all losses, the developed torque (T) of a dc separately excited motor, operating under constant terminal voltage, is related to its output power (P) as under

- a. $T \propto \sqrt{P}$. b. $T \propto P$.*
 c. $T^2 \propto P^3$. d. T independent of P.

163. The commutator in a dc machine can convert
 a. ac to dc. b. dc to ac.
 c. both (a) and (b)* d. None of these.

164. A 4- Pole dc generator is running at 1,500 rpm. The frequency of current in the armature is
 a. 25 Hz. b. 50 Hz.*
 c. zero Hz. d. 100 Hz.

165. For a P-pole machine, the relation between electrical and mechanical degree is given by

- a. $q_{elec} = \frac{2}{P} \theta_{mech}$. b. $q_{elec} = \frac{4}{P} \theta_{mech}$.
 c. $q_{elec} = P q_{mech}$. d. $q_{elec} = \frac{P}{2} \theta_{mech}$.*

166. A dc generator can be considered as a
 a. rotating amplifier.* b. power pump.
 c. rectifier. d. prime mover.
 e. none of these.

167. The direction of emf generated in a dc generator can be found out by considering
 a. Fleming's right hand rule.*
 b. Fleming's left hand rule.
 c. Lenz's law.
 d. Kirchhoff's law.

168. The emf produced in a dc generator is ____ induced emf.
 a. statically. b. dynamically.*
 c. magnetically. d. electrostatically.
169. In a dc machine
 a. the current and emf in armature conductors are alternating while those at the terminals are unidirectional.*
 b. the current and emf in armature conductors are unidirectional while those at the terminals are alternating.
 c. the current and emf in armature conductors and at the terminals are unidirectional.
 d. the emf in armature conductors and at the terminals is alternating while current there is unidirectional.
170. The induced voltage in a single loop reverses
 a. one each revolution.
 b. once each half revolution.*
 c. once each one-quarter revolution.
 d. 8 times each revolution.
171. Wave OAB is produced in ____ revolution (s) of conductor.

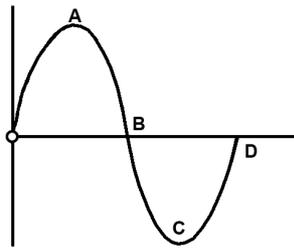


Fig. 2

- a. two b. one
 c. half.* d. one quarter.
172. The magnetic field of a dc generator is connected to a 50 Hz sinusoidal supply the voltage induced in the armature will be
 a. of 50 Hz sinusoidal b. of 25 Hz sinusoidal
 c. zero.* d. dc.
173. In a dc generator having P number of poles and speed of N rpm, the frequency of magnetic reversals will be
 a. $\frac{PN}{60}$ b. $\frac{PN}{120}$ *
 c. $\frac{PN}{240}$ d. $\frac{PN}{2}$
174. A lap wound armature winding, fitted with a commutator and a pair of brushes of it is rotated at a speed N_r in a rotating magnetic field having P poles and rotating at a speed N_f in space N_i in space N_r and N_f both being in the same direction. The frequency of induced voltage across the brushes on the commutator is
 a. $\frac{N_f P}{120}$ * b. $\frac{PN}{120}$
- c. $\frac{PN}{240}$ d. $\frac{PN}{2}$
175. The polarity of a dc generator is reversed by reversing the direction of
 a. field current as well as rotation.
 b. rotation.
 c. field current.*
176. In large dc generators, the magnetic field is produced by
 a. permanent magnets. b. electro-magnets.*
 c. either (a) or (b). d. none of these.
177. For the production of induced emf the field system of an electric machine must be on
 a. stator. b. rotor.
 c. stator or rotor.*
178. The yoke of a dc machine is made of _____ magnetic material.
 a. soft.* b. hard.
 c. non d. very good.
179. The yoke of a small dc machine is made of
 a. copper. b. aluminium
 c. cast iron.* d. stainless steel.
180. The frame of a dc generator is made of
 a. copper. b. aluminium
 c. cast iron.* d. bronze.
181. The yoke of a small dc generator is made of cast iron as it
 a. is cheaper.*
 b. gives mechanical protection to the machine.
 c. completes the magnetic path.
 d. all of the above.
182. The yoke of a large machine is invariably made of fabricated steel because of its
 a. high permeability.* b. low permeability.
 c. low cost. d. low specific gravity.
183. The yoke of a dc machine _____ laminated.
 a. is b. is not*
 c. sometimes d. may or may not be
184. Laminated yoke in dc motor can reduce
 a. speed regulation. b. iron loss.*
 c. temperature rise. d. sparking on load.
185. If the flux per pole is f, then the flux in the yoke section will be approximately
 a. 2 f b. f
 c. $f/2$ * d. 1.1 f
186. Pole shoe of a dc machine is laminated for the purpose of
 a. decreasing hysteresis loss.

- b. decreasing eddy current loss.*
 c. decreasing both hysteresis and eddy current loss
 d. manufacturing ease.
187. In a dc machine the pole shoes are fastened to the poles cores by
 a. counter sunk screws *b. rivets.
 c. brazing. d. soldering.
188. The pole shoes of a dc machine _____ laminated.
 a. are never b. are sometimes
 c. are always * d. may or may not be
189. The pole core of a dc machine is _____ laminated.
 a. usually not * b. always
 c. never d. may or may not be
190. Eddy currents are induced in the pole shoes of a dc machine due to
 a. pulsating magnetic flux.
 b. oscillating magnetic flux.
 c. relative motion between field and armature.*
 d. all of the above.
191. The function (s) of pole shoes in a dc machine is/are to
 a. support the field coils.
 b. reduce the reluctance of the magnetic path.
 c. spread out the flux to achieve uniform flux distribution in the air gap.
 d. all of the above.*
192. Poles of dc machine are often laminated to
 a. reduce pulsation loss.*
 b. reduce armature reaction.
 c. reduce iron weight.
 d. dissipate more heat.
193. The field coils of a dc machine are made of
 a. carbon. b. copper.*
 c. mica. d. steel.
194. The exciting or field coils in a dc machines are wound
 a. around the poles.* b. separately.
 c. in the armature slots. d. around the yoke.
195. The short-circuited field coil in a dc machine will give
 a. odour of burning insulation.
 b. reduction in generated voltage.
 c. unbalanced magnetic pull causing vibrations.
 d. all of the above.*
196. The permissible temperature rise in a dc machine winding is
 a. 80 to 100° C. b. 40 to 50° C*
 c. 20 to 25° C. d. 10 to 20° C
197. The amount of flux leakage depends upon
 a. air gap length.
 b. flux density used in a core and teeth.
 c. magnet core shape.
 d. all of the above.*
198. The flux leakage coefficient is usually
 a. 0.6 to 0.8 * b. 1.05
 c. 1.1 to 1.3 d. 2 to 2.5
199. The ventilating ducts in most of the dc machines are
 a. radial.
 b. longitudinal.
 c. radial as well as longitudinal.*
 d. none of these.
200. The bearings employed for supporting the rotor shafts are usually _____ bearings.
 a. bush b. ball of roller *
 c. needle d. magnetic
201. The rotating part of a dc machine is called the
 a. rotor. b. field.
 c. armature.* d. stator.
202. In a dc machine the part which houses the conductors and in which emf induced is to be utilized is called the
 a. armature.* b. stator.
 c. rotor. d. pole.
203. Armature of a dc machine is made of
 a. conducting material. b. insulating material.
 c. non-ferrous material. d. silicon steel.*
 e. stainless steel.
204. The armature of a dc machine is laminated to reduce
 a. eddy current loss.*
 b. hysteresis loss.
 c. copper losses.
 d. friction and windage losses.
205. The thickness of laminations used for armature core of a dc machine is of the order of
 a. 0.005 mm. b. 0.05 mm.
 c. 0.5 mm.* d. 5 mm.
206. The armature core is made of silicon steel because of its
 a. high permeability.
 b. low permeability.
 c. more mechanical strength.
 d. both (a) and (c).*
207. The laminations of armature core of dc machine are made of silicon steel to reduce _____ losses.
 a. hysteresis*
 b. eddy current
 c. both hysteresis and eddy current
 d. friction and windage
 e. copper
208. If the flux in the air gap is f , then the flux in the armature core section of dc machine is
 a. $2f$ b. $f/2$ *
 c. f d. $1.1f$
209. The teeth in the armature of a dc machine are sometimes

- skewed. This is done to reduce
- hysteresis loss.
 - copper loss.
 - eddy current loss.
 - vibrations.*
210. The parts of the armature electric circuit which take active part in emf generation are
- the commutator segments.
 - the overhangs.
 - the coils sides inside the slots.*
 - both (b) and (c).
211. In a dc machine, the armature conductors are
- firmly placed in slots.*
 - wound around the armature core.
 - welded to armature core.
 - soldered to armature.
212. The rotor is _____ to the shaft.
- bolted.
 - keyed.*
 - welded.
 - soldered.
213. In a dc machine if the number of slots in the armature are more
- cost is likely to be low.
 - commutation will be poor.
 - cost will be more.*
 - the flux pulsation will be more.
214. The component of a dc generator which plays vital role in providing direct current is
- dummy coils.
 - equalizer rings.
 - commutator*
 - brushes.
215. In a dc generator, the current is collected from armature through
- commutator and brushes.*
 - slip rings and brushes.
 - solid connections.
 - helical springs.
216. The commutator of a dc machine acts as a ___ rectifier.
- full wave*
 - half-wave
 - controlled full wave
 - controlled half-wave.
217. A commutator is made up of
- iron laminations.
 - copper segments.*
 - both iron laminations and copper segments.
 - none of the above.
218. The commutator segments of a dc machine are made of
- carbon
 - stainless steel.
 - hard drawn copper*
 - tungsten
 - brass
219. The copper segments are connected to the armature conductors by means of
- copper lugs.*
 - resistance wire.
 - brazing.
 - insulated wire.
220. The insulation used between the commutator segments is normally
- paper.
 - mica.*
 - graphite.
 - fabric.
221. To avoid formation of grooves in the commutator
- the brushes of opposite polarity should track each other.*
 - the brushes of same polarity should track each other.
 - brush position has no effect on the commutator grooving.
222. The emf generated by a dc generator is limited to 650V. This is mainly due to limitations imposed by
- armature
 - brush material
 - commutator*
 - insulating material
223. The function of brushes in a dc generator is to
- collect the current from the commutator and supply it to external circuit.*
 - prevent sparking.
 - keep the commutator clean.
 - provide continuity between adjacent commutator segments.
 - convert as into dc.
224. The brushes for commutation are made of
- aluminium.
 - copper.
 - carbon.*
 - mica.
225. Copper brushes in dc machines are used
- Where high voltage and small current are involved.
 - where low voltage and higher currents are involved.*
 - because they are self lubricating.
 - because they are cheap.
226. The voltage drop will be minimum in case of _____ brushes.
- metal graphite.*
 - carbon
 - graphite.
 - aluminium
227. In a dc machine carbon brushes are generally used as they
- are soft.
 - are self lubricating.
 - have high resistance.
 - all of these.*
228. In dc machines, the brushes remain in contact with conductors lying
- under north pole.
 - under south pole.
 - in the interpolar gaps.*
 - farthest from the poles.
229. The brushes of a dc machine should be placed on the
- commutator in the interpolar axis.
 - commutator in the polar axis.
 - armature in the polar axis.*
 - armature midway between poles.

230. In a dc machine, the brushes are physically placed in the
 a. polar axis and electrically connected to the coils lying in the interpolar axis.*
 b. polar axis electrically connected to the coils lying in the polar axis.
 c. interpolar axis and electrically connected to the coils lying in polar axis.
 d. interpolar axis and electrically connected to the coils lying in inter polar axis.
231. In a dc machine, the rapid brush wear may be due to
 a. severe sparking.
 b. rough commutator surface.
 c. imperfect contact with commutator.
 d. any of the above.*
232. The factors responsible for rapid wear of brushes are
 a. high mica insulation between commutator bars.
 b. excessive spring pressure.
 c. abrasion from dust.
 d. rough commutator bars.
 e. all of the above.*
233. In dc machines, the pressure on brushes is kept usually below
 a. 0.5 kg/cm^2 b. 1 kg/cm^2 *
 c. 2 kg/cm^2 d. 5 kg/cm^2
234. In dc machines, the armature windings are placed on the rotor because of the necessity for
 a. electro-mechanical energy conversion.
 b. generation of voltage.
 c. commutation.*
 d. development of torque.
235. The main advantage of using fractional pitch winding is to reduce
 a. amount of copper in the winding.*
 b. size of the machine.
 c. harmonics in the emf.
 d. cost of the machine.
236. Lap winding is more suitable for
 a. low voltage, high current machine.*
 b. high voltage, high current machine.
 c. high voltage, low current machine.
 d. low voltage, low current machine.
237. The armature resistance in case of lap wound armature having Z conductors each conductor of length l meters, x -sectional area $a \text{ m}^2$, resistivity p and P poles will be
 a. $P \frac{1}{a} \frac{Z}{P^2}$ * b. $p \frac{1}{a} Z$
 c. $p \frac{1}{a} ZP$ d. $p \frac{1}{a} ZP^2$
238. In lap winding, the number of brushes is always _____ the number of poles.
- a. double b. same as*
 c. half d. none of these
239. A P -pole lap wound dc machine had an armature current I_a . The conductor current in the armature winding is
 a. I_a b. I_a/P *
 c. $P I_a$ d. none of above.
240. A lap wound dc machine has 400 conductors and 8 poles. The voltage induced per conductor is 2 V. The machine generates a voltage of
 a. 100 V.* b. 200 V.
 c. 400 V. d. 800 V.
241. A 4-pole generator with 16 coils has a two layer lap winding. The pole pitch is
 a. 32 b. 16
 c. 8* d. 4
242. Welding generator will have
 a. lap winding* b. wave winding
 c. either lap or wave winding
 d. none of these.
243. If in a 6 pole lap wound dc machine, the air gap under each pole is not the same, this is likely to result in
 a. higher terminal voltage.
 b. reduced eddy currents.
 c. unequal currents in parallel paths.*
 d. none of the above.
244. The number of parallel paths for a 4-pole duplex lap winding will be
 a. 2 b. 4
 c. 6 d. 8*
245. Minimum number of coils for 400 V, 6-pole lap connected dc machine for a maximum voltage of 15 V between adjacent commutator segments should be
 a. 80 b. 160*
 c. 200 d. 400
246. Width of a carbon brush should be equal to
 a. less than the width of one commutator segment
 b. the width of 1 to 2 commutator segments.
 c. the width of 2 to 3 commutator segments.*
 d. the width of more than 3 commutator segments.
247. The commutator pitches in simplex and duplex lap windings are _____ respectively.
 a. 1 and 2* b. 2 and 1
 c. 1 and 1 d. 2 and 4
 e. 2 and 2
248. The number of re-entrance of a duplex lap winding is 2 only if the
 a. number of slots is odd.
 b. commutator pitch is odd.
 c. number of coils is even.*
 d. commutator pitch is 2

249. A duplex lap winding with equalizers and even number of pairs of poles is
- doubly re-entrant and number of coils per pair of poles is an odd integer.*
 - double re-entrant and number of coils per pair of poles is an even integer.
 - singly entrant and number of coils per pair of poles is an even integer.
 - singly entrant and number of coils per pair of poles is an odd integer
250. Wave winding is composed of
- any odd number of conductors.
 - any even number of conductors.
 - that even number which is exact multiple of poles \pm *
 - that even number which is exact multiple of poles.
251. For a 4-pole machine wave windings is impossible with _____ armature conductors.
- 30
 - 32*
 - 34
 - 38
252. If m is the degree of multiplying and P is the number of poles, the number of parallel paths in a multiplex wave winding will be
- $2P$
 - 2
 - $2m$.*
 - mP .
253. For a 6-pole wave wound armature, the number of brushes required will be
- 2 *
 - 6
 - 4
 - 12
254. The purpose of providing dummy coils in a wave wound dc machine armature is to
- enhance flux density.
 - amplify voltage.
 - mechanical balance for the rotor.*
 - reduce eddy current loss.
255. The number of re-entrance of a triplex wave winding is 3 only if
- the number of coils is divisible by 3.
 - the commutator pitch is divisible by 3.
 - both the number of coils and commutator pitch are divisible by 3.*
 - the number of slots is divisible by 3.
256. A homopolar generator usually has
- high voltage and high current.
 - low voltage and high current.*
 - low voltage and low current.
 - high voltage and low current.
257. In a dc generator, the ripples in the direct emf generated are reduced by employing
- commutator with large number of segments.*
 - equalizer rings.
 - carbon brushes.
 - graphite brushes.
258. In the wave wound and lap wound armatures of a 6-pole dc generator generated emf will be in the ratio of
- $1:3$
 - $3:1$ *
 - $1:6$
 - $6:1$
259. The armature resistance of a 6-pole lap wound dc machine is 0.05Ω . If the armature is rewound using a wave winding, then the armature resistance will be
- 0.45 *
 - 0.30
 - 0.15
 - 0.10
260. An 8-pole dc machine has wave winding. The winding is removed and then rewound as lap winding. The induced emf will
- increase.
 - reduce.*
 - remain unchanged.
 - none of these.
261. For fixed number of poles and number of armature conductors in a dc generator which winding will give higher emf?
- Wave winding.*
 - Lap winding.
 - Either of (a) and (b)
 - Depends upon other design features.
262. In order to ascertain whether a dc machine is lap wound or wave wound on the basis of visual observations of the armature, one should observe the
- connections to the brushes.
 - connections to the commutator.
 - connections to the field winding.
 - direction of end connections.*
263. The coil span
- must be exactly equal to pole pitch.
 - can never be equal to pole pitch.
 - may or may not be exactly equal to pole pitch.*
 - none of the above.
264. The commutator pitch for simplex lap winding is
- $+1$
 - -1
 - $+1$ or -1 *
 - average pitch.
265. The commutator pitch for simplex wave winding is equal to
- $+1$ or -1
 - twice average pitch.
 - average pitch.*
 - half average pitch.
266. In a dc machine armature winding, the number of commutator segments is equal to the number of armature
- coils*
 - coils sides
 - conductors
 - turns
267. For both lap and wave windings, there are as many commutator bars as the number of
- armature conductors.
 - winding elements.*
 - poles.
 - slots.
268. In a drum type dc armature winding the back pitch and front pitch in terms of the coil-sides must be

286. Approximate physical size of the 50 kw, 1800 rpm dynamo as a function of a 25 kw, 900 rpm dynamo will be
- 1*
 - 1/2
 - 1/4
 - none of the above
287. The armature mmf wave in a dc machine is
- sinusoidal
 - triangular*
 - rectangular
 - square
288. In dc machines, the air gap flux distribution depends on load is
- sinusoidal
 - triangular
 - flat topped*
 - pulsating
289. In a dc machine, the actual flux distribution depends upon
- size of air gap.
 - shape of pole shoes.
 - clearance between tips of the adjacent pole shoes.
 - all of the above.*
290. In a dc machine, the space waveform of the air-gap flux distribution affects
- torque only.
 - voltage only.
 - both the torque and voltage.
 - neither the torque nor the voltage.*
291. In a dc machine the armature mmf is
- stationary with respect to the field poles but rotating with respect to the armature.*
 - rotating with respect to field poles as well as armature.
 - rotating with respect to field poles.
 - stationary with respect to armature.
292. The brushes ideally should be placed along
- GNP
 - MNP
 - polar axis*
 - none of these.
293. In a dc machine without any brush shift, the shift of the magnetic neutral axis owing to armature and motor.
- in the direction of rotation for both the generator and the motor
 - against the direction of rotation for both the generator and the motor.
 - in the direction of rotation for the generator and against the direction of rotation for the motor.*
 - against the direction of rotation for the generator and in the direction of rotation of motor.
294. In a dc machine, the reduction in the total mutual airgap flux due to armature reaction is about
- 8%*
 - 20%
 - 40%
 - 60%
295. The armature reaction in case of an unsaturated dc machine is
- magnetizing
 - cross-magnetizing*
 - demagnetizing
 - none of these.
296. In a dc machine. on no load the magnetic neutral axis
- moves from geometrical neutral axis in the direction of rotation.
 - moves from geometrical neutral axis in the opposite direction of rotation.
 - coincides with the geometrical neutral axis.*
 - none of the above.
297. Due to magnetic saturation, the flux per pole in a dc machine without brush shift
- increase in both the generators and the motors with load.
 - decreases in both the generators and the motors with load.*
 - increases in generators but decreases in motors with load.
 - decreases in generators and increases in motors with load.
298. In a dc generator to shift of the brushes, so as to bring them in magnetic neutral axis, will cause
- cross-magnetization.
 - demagnetization.
 - both (a) and (b).*
 - none of these.
299. In a dc generator, demagnetizing component of armature reaction causes
- reduction in generated emf.*
 - increase in speed.
 - sparking trouble.
 - none of the above.
300. If the brushes are given a small amount of forward shift in case of a dc generator, the armature reaction effect will be
- totally demagnetizing.
 - totally cross-magnetizing.
 - partly demagnetizing and partly cross magnetizing.*
 - totally magnetizing.
301. In a dc machine, the number of mechanical and electrical degrees will be same when the number of poles on the machine is
- 4
 - 2*
 - 8
 - 1
302. Armature coil is short-circuited by brushes when in lies
- along field axis.
 - along neutral axis.*
 - in any of the above position.
 - in none of the above positions.
303. Air gap at the pole tips of a dc machine is kept more than that at the centre of the pole mainly to reduce
- reactance voltage.
 - effect of armature reaction.*
 - losses of armature core.
 - noise of the machine.
304. Commutation in a dc machine may be explained as a process

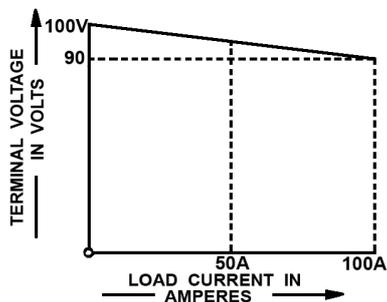
- a. in which magnetic field is setup.
 b. by virtue of which emf is induced in the armature conductors.
 c. by which current in a coil is reversed during the period it is short-circuited by the brush.*
 d. how armature flux affects the main field flux.
305. Current in a coil undergoing commutation is not able to get reversed completely by the end of commutation period. It is due to
 a. reactance voltage induced in the coil.*
 b. coil resistance.
 c. armature emf.
 d. none of the above.
306. In a dc machine, the armature reaction and the inductance of commutating coils cause _____ commutation.
 a. over
 b. under*
 c. linear
 d. sinusoidal
307. Under-commutation result in
 a. sparking at the middle of the brush.
 b. sparking at the leading edge of the brush.
 c. sparking at the trailing edge of the brush.*
 d. no sparking.
308. In a dc shunt generator working on load, the brushes are moved forward in the direction of rotation, as a result of this, commutation will
 a. improve but terminal voltage will fall.*
 b. worsen and terminal voltage will fall.
 c. improve and terminal voltage will rise.
 d. worsen and terminal voltage will rise.
309. In a dc machine, the sparking between brushes and commutator surface may be due to
 a. under commutation.
 b. over commutation.
 c. to rapid reversal of current.
 d. any of the above.*
310. The self induced emf in the coil undergoing commutation is called the
 a. reactance voltage.*
 b. statically induced voltage.
 c. dynamically induced voltage.
 d. none of the above.
311. The sparking at the brushes, in a dc machine, is due to
 a. armature reaction.
 b. reactance voltage.*
 c. presence of commutator.
 d. high resistance of carbon voltage.
312. The reactance voltage is
 a. directly proportional to armature current and commutation period.
 b. directly proportional to commutation period and inversely proportional to armature current.
 c. directly proportional to armature current and inversely proportional to commutation period.*
 d. none of the above.
313. If the armature current in a dc machine is increased to double its previous value and the time of commutation is halved, then the reactance voltage will
 a. be halved.
 b. remain the same.
 c. be doubled.
 d. become four times.*
314. To have sparkles commutation the armature reaction effect in a dc machine is neutralised by
 a. using compensation winding and commutating poles.*
 b. shifting the brush axis from the geometrical neutral axis to the magnetic neutral axis.
 c. fixing the brush axis in the line with the pole axis.
 d. increasing axis the field excitation.
315. To have sparkless commutation in a dc generator, the brushes are rocked ahead so as to be
 a. just ahead of magnetic neutral axis.*
 b. in magnetic neutral axis.
 c. just behind the magnetic neutral axis.
 d. in geometrical neutral axis.
316. Consider the following statements about commutating poles which are fitted on most large dc shunt motors.
 1. The commutating poles are placed in geometric neutral planes and their number is usually equal to the number of main poles.
 2. The winding on the commutating poles is connected in series with the shunt field winding on the main poles.
 3. The polarity of the commutating pole must be that of the next main pole further ahead.
 4. The commutating poles neutralize the reactance voltage produced in the coil undergoing commutation.
- Of these statements**
 a. 1, 2 and 3 are correct.
 b. 1 and 4 are correct.*
 c. 2, 3 and 4 are correct.
 d. 1, 2 and 4 are correct.
317. Interpoles are provided in dc machines to
 a. neutralize the cross-magnetizing component of armature reaction.*
 b. neutralize the demagnetizing component of armature reaction.
 c. reduce iron loss.
 d. reduce copper losses.
318. The function of interpoles in a dc machine is to
 a. reduce field winding heating.
 b. improve commutation.*
 c. compensate for air gap variation.
 d. reduce losses.
319. Compensating winding in a dc machine
 a. counteracts armature mmf in the interpolar zone.
 b. prevents large speed drop.
 c. shunts most of the armature current.

- d. performs none of the above.*
320. Compensating winding is provided in a dc machine to counter act
- armature reaction mmf in the interpolar zone.
 - armature reaction mmf under the polefaces.
 - armature reaction mmf in the commutating zone.
 - both (b) and (c).
321. The compensating windings are placed in the slots in the pole faces to neutralize the
- cross-magnetizing effect.
 - de-magnetizing effect.
 - both of the de-magnetizing and cross magnetizing effects.
 - armature flash over between positive and negative brushes.*
322. In large sized dc machines the compensating windings are provided to
- compensate for the decrease in speed due to increase of load.
 - neutralize the voltage induced in the coil due to high fluctuation of load.*
 - reduce eddy current losses by providing local short-circuits.
 - none of the above.
323. Compensating winding in a dc machine is placed on
- armature in slots.
 - yoke in the interpolar gap.
 - yoke in the pole faces.*
 - partly in armature slots and partly in pole faces.
324. Compensating windings are employed in dc motors which are likely to operate
- at a constant speed over wide range of load.
 - with rapidly changing loads of wide range.
 - over wide range of speed by field excitation control.
 - both (b) and (c).*
325. In dc machines, the interpoles are provided
- for mechanical balancing of machines.
 - to counteract the demagnetizing effect of armature mmf in the commutating zone
 - to counteract the reactance voltage and the cross-magnetizing effect of armature mmf in the commulating zone.
 - to make commutation sparkless.
 - both (c) and (d).*
326. In dc machines the interpoles are provided to
- neutralize the armature reaction effect in the interpole region.*
 - increase the emf generated.
 - increase the main field flux.
 - all of the above.
327. The commutating flux produced by interpole must be proportional to
- armature current.*
 - field current.
 - both armature and field currents.
 - none of the above.
328. The polarity of the interpole is the
- same as that of main pole ahead in case of generator.
 - same as that of main pole ahead in case of motor.
 - same as that of main pole behind in case of motor.
 - same as that of main pole behind in case of generator.
 - both (a) and (c).*
329. The interpole air gap is that under the field poles, in dc machines.
- smaller than
 - larger than*
 - equal to
 - none of these
330. A dc machine is provided with both interpole and compensating windings. These two windings with respect to armature circuit will be in
- series*
 - parallel
 - former in series and the latter in parallel.
 - former in parallel and the latter in series.
331. The field of self excited generator is excited by
- External source of dc.
 - ac
 - by its own current*.
 - either dc or ac.
332. The mmf necessary for establishment of flux in the magnetic circuit of a dc generators can be obtained by means of field coils excited by
- some separate source.
 - the generator itself.
 - either of the above methods.*
 - none of these.
333. In a separately excited dc generator the field is connected
- in series with an armature
 - across the armature
 - to an external supply source.*
 - none of the above.
334. Series field winding of a dc machine consists of
- few turns of thick wire.*
 - few turns of thin wire.
 - many turns of thick wire.
 - many turns of thin wire.
335. The armature current and field current will be equal in case of dc _____ machines.
- shunt
 - series*
 - separately excited
 - none of these
336. Shunt field winding of a dc machine consist of
- many turns of thin wire.*
 - many turns of thick wire.
 - few turns of thick wire.
 - few turns of fine wire.

337. The armature current in a dc shunt generator is given as
- a. $\frac{E_g + V}{R_a}$ b. $\frac{E_g}{R_a}$
- c. $\frac{E_g - V}{R_a} *$ d. $I_L + I_{sh}$
338. The armature of a dc machine has a resistance of 0.1 W and is connected to a 230 V supply. What will be the emf of generator giving 80 A ?
- a. 8V b. 22V
- c. 238V* d. 230V
339. The series field of a short shunt dc generator is excited by _____ current.
- a. armature b. shunt field
- c. load* d. $I_L + I_{sh}$
340. The field current flowing through shunt field in a short shunt compound wound generator is given as
- a. $I_{sh} = \frac{V + I_{sc} R_{sc}}{R_{sh}} *$ b. $I_{sh} = \frac{V}{R_{sh}}$
- c. $I_{sh} = \frac{E_g}{R_{sh}}$ d. $I_{sh} = \frac{V - I_{sc} R_{sc}}{R_{sh}}$
341. If we increase field current of a dc generator, its emf output
- a. increases indefinitely.
- b. increases till the winding burns.
- c. increases till the magnetic saturation increases.*
- d. first increase and then starts reducing.
342. In a dc series generator, the critical resistance refers to the resistance of
- a. armature b. field*
- c. load d. brushes
343. The slight curvature at the lower end of the OCC of a self excited dc generator is due to
- a. magnetic inertia b. residual flux.*
- c. high speed d. high field resistance
344. The fall in speed of a dc generator due to increase in load can be corrected by
- a. cooling the armature.
- b. increasing the excitation.
- c. reducing the load voltage.
- d. increasing the input to the prime-mover.*
345. The magnetic field which initially induces emf in the armature in a self excited dc generator is because of
- a. permanent magnets. b. armature rotation.
- c. residual magnetism.* d. none of the above.
346. A generator may loose residual magnetism due to
- a. heating. b. vibrations.
- c. over excitation. d. any of these.*
347. In dc generators, the residual magnetism is of the order of
- a. 2.5 %* b. 10%
- c. 15% d. 25%
348. In comparison to self excited generator, a separately excited generator
- a. is more reliable.
- b. is amenable to better voltage regulation.
- c. has exciting current independent of load characteristics.
- d. has all of the above features.*
349. A separately excited dc generator has an open circuit voltage E_0 for a certain value of field current. If the field current is halved, the open circuit voltage will be
- a. $\frac{1}{2} E_0$ b. less than $\frac{E_0}{2}$
- c. may be $\frac{E_0}{2}$ or more than $\frac{E_0}{2}$.*
- d. $2 E_0$.
350. The voltage at the terminals of a dc series generator running at rated rpm and no load will be
- a. more than the rated voltage.
- b. full rated voltage.
- c. a very small voltage.*
- d. zero.
351. A dc series generator can excite itself
- a. only on zero load current.
- b. only when load current is not zero.*
- c. irrespective of the value of load current.
- d. none of the above.
352. A dc series generator is provided with divertor and is delivering its rated current. If the divertor switch is opened, the terminal voltage will
- a. remain constant. b. decrease.
- c. increase.* d. none of these.
353. In a 4 pole, 25 kw, 200 V wave wound dc shunt generator the current in each parallel path will be
- a. 62.5 A* b. 125 A.
- c. 31.25 A. d. 250 A.
354. A dc generator beyond critical resistance will generate
- a. maximum power. b. maximum voltage.
- c. maximum current. d. no voltage.*
355. If the field circuit resistance of a dc shunt generator exceeds its critical value, the generator
- a. fails to build up.*
- b. builds up a very high voltage.
- c. exceeds its current capacity.
- d. produces power beyond its rating.
356. The terminal voltage of a dc shunt generator on loading
- a. increases slightly b. decreases slightly*

- c. decreases sharply d. remains constant

357. The factor that is not responsible for drop in terminal voltage of a dc shunt generator on load is
- a. commutation.*
 - b. armature reaction.
 - c. armature resistance drop.
 - d. field weakening due to (b) and (c).
358. An external resistance added in the field circuit of a dc shunt generator will cause
- a. decrease in terminal voltage.*
 - b. increase in terminal voltage.
 - c. increase in power delivered.
 - d. increase in armature speed.
359. In a dc shunt generator, the voltage build up is generally restricted due to
- a. armature heating. b. insulation restriction.
 - c. saturation of iron.* d. speed limitation.
360. A dc shunt generator having a shunt field of 50Ω was generating normally at 1000 rpm. The critical resistance of the machine was 80Ω . Due to some reasons, the speed of the prime-mover became such that the generator just failed to generate. The speed at that time must have been
- a. 1600 rpm. b. 800 rpm.
 - c. 625 rpm.* d. 500 rpm.
361. The winding of a dc machine which should not be opened when energized is
- a. shunt field.* b. series field.
 - c. inter pole. d. compensating.
362. The external load characteristics of a dc generator at rated speed is assumed to be linear and is shown below. The load circuit comprises only resistance. When the load current is 50 A, the value of load circuit resistance will be



- a. 0.9 W b. 0.1 W*
- c. 1.9 W d. 2.0 W

363. An ideal dc generator has a regulation of _____ percent.
- a. zero*
 - b. 10
 - c. 25
 - d. 100

364. A dc generator delivers 210 volts on no load and 200 V

on full load. The voltage regulation of the dc generator is

- a. 95 % b. 5 %*
- c. 10 % d. 4.76 %

365. Consider the following statements
1. In a dc series generator, full load voltage is more than the no load voltage.
 2. In a separately excited dc generator full load voltage is more than the no load voltage.
 3. In a dc shunt generator, full load voltage is less than the no load voltage.

Of these statements.

- a. 1, 2 and 3 are correct.
- b. 1 and 2 are correct.
- c. 2 and 3 are correct.
- d. 1 and 3 are correct.*

366. The terminal voltage of an over-compounded dc generator
- a. decrease with the increase in load current.
 - b. increases with the increase in load current.*
 - c. remains constant at all load current.
 - d. none of the above.

367. A cumulatively compounded dc generator is supplying 20 A at 200 V. Now if the series field winding is short-circuited, the terminal voltage
- a. will remain unaltered at 200 V
 - b. will rise to 220 V
 - c. will shoot upto a very high value
 - d. will becomes less than 200 V*

368. A dc generator will be flat compounded if
- a. its terminal voltage remains constant irrespective of the load current supplied by the generator.*
 - b. generated voltage is in proportion to load current.
 - c. the generator is capable of producing higher voltage at light load.
 - d. terminal voltage increases slightly with the load

369. Over or under compounding of a dc generator is achieved by
- a. shunting more or less current from the shunt field.
 - b. shunting more or less current from the series field.*
 - c. connecting it as long shunt.
 - d. connecting it as short-shunt.

370. An over-compounded dc generator is supplying 800 A at full load on 500 V. The resistance of each conductor is 0.02Ω . The percentage of compounding is
- a. 1.6 % b. 3.2 %
 - c. 6.4 %* d. 12.8 %

371. Which of the following dc generators will be in a position to build up without any residual magnetism in the field ?
- a. Series b. Shunt
 - c. Separately excited* d. Compound

372. Which of the following dc generators has rising

- V-I characteristics ?
- Series*
 - Shunt
 - Compound
 - None
373. Which of the following dc generators will have negligible terminal voltage on no load ?
- Series*
 - Shunt
 - Compound
 - None
374. An exciter for turbo-generator is a dc _____ generator.
- shunt*
 - series
 - compound
 - separately excited
375. For a specific open circuit voltage of a dc generator, the short-circuit will be maximum when it is
- separately excited.
 - shunt connected.
 - cumulatively compounded.*
 - differentially compounded.
376. Which of the following dc generator will give constant terminal voltage on all loads ?
- Series
 - Shunt
 - Level compounded*
 - Separately excited
 - short-shunt compounded
377. The voltage regulation of a dc generator at full load being zero implies that the generator is
- shunt-connected.
 - differentially compounded.
 - cumulatively compounded.*
 - series-connected
378. The _____ generator has the poorest voltage regulation
- shunt
 - over compounded
 - under compounded*
 - differential compounded
379. The voltmeter connected across a generator reads voltage same at no-load and at full load (rated). The generator is of the type:
- Shunt generator
 - Series generator
 - Level compound*
 - Short-shunt compound
380. A dc shunt generator, when driven at its rated speed, is found to be not generating any voltage. Which of the following would account for this ?
- There is no residual magnetism.
 - The connection of the field winding is not proper with respect to the armature terminals.
 - The load resistance is less than the critical armature resistance.
- Select the correct answer using the codes given below:
Codes :
- 1 and 2
 - 1 and 3
 - 1, 2 and 3*
 - none of the above.
381. A dc shunt generator driven at normal speed in the normal direction fails to build up voltage. The probable reason (s) may be
- there is no residual magnetism.
 - the residual magnetism may have been reversed in polarity.
 - the field resistance is more than its critical value.
 - the field winding terminals may have been reversed in polarity.
 - any of the above.*
382. The residual magnetism of a dc shunt generator can be regained by
- connecting the shunt field to a battery.*
 - running the generator on no-load for some time.
 - grounding the shunt field.
 - reversing the direction of rotation of the generator.
383. Flashing of field of dc generator means
- neutralize of residual magnetism.
 - creation of residual by a dc source.*
 - increasing flux density by providing extra ampere-turns in field.
 - none of the above.
384. If a self excited dc generator after being installed fails to build up during its first trial, the remedy lies in
- increasing the prime-mover speed.
 - reversing the field connections.*
 - increasing the field resistance.
 - reducing the field resistance.
385. A dc series generator is employed
- as a booster to maintain constant voltage at the load end of the feeder.*
 - for supplying traction load.
 - for supplying industrial load at constant voltage.
 - for battery charging.
386. The type of dc generator used for arc welding purposes is a
- series generator.
 - shunt generator.
 - cumulatively compounded generator.
 - differentially compounded generator.*
387. In arc welding, in order to obtain steady arc one should be
- dc series generator.
 - dc shunt generator.
 - dc differentially compounded generator.*
 - dc cumulatively compounded generator.
388. The essential condition for satisfactory parallel operation of two dc generators is that they should have same
- kw output rating.
 - drooping voltage characteristics.*
 - percentage regulation.
 - speed of operation.
389. When two dc series generators are operating in parallel, an equalizer bar is used

- a. to reduce armature reaction.
 b. to increase emf.
 c. to increase the speed.
 d. to reduce the flux.
 e. so that the two similar machines take approximately equal load current.*
390. The simplest way of shifting load from one shunt generator to the other operating in parallel is by
 a. adjustment of speeds.
 b. adjustment of armature resistances.
 c. adjustment of field rheostats.*
 d. using equalizer connections.
391. If one generator is to be taken out of two generators operating in parallel
 a. the excitation of first is reduced and of the second is increased gradually and simultaneously.*
 b. the excitation of first generator is reduced gradually.
 c. the input to the prime mover of the first generator is suddenly reduced to zero.
 d. the main switch of the first generator is suddenly open.
392. A pair of similar dc shunt generators operate in parallel and supply a common load. It is required to switch off machine no. 1 and allow machine no. 2 to supply the circuit load. The following operations are to be used to achieve this
 1. Switch off the main switch of machine no. 1
 2. Reduce the field current of machine no. 1
 3. Increase the field current of machine no. 2
 4. Ensure that machine no. 1 just floats.
 The correct sequence of these operations is
 a. 4, 3, 2, 1 b. 2, 3, 4, 1*
 c. 2, 4, 3, 1 d. 3, 2, 4, 1
393. Two dc shunt generators having equal open circuit emfs but slight different load characteristics are operating in parallel, then
 a. the machines will share load equally.
 b. the machines with more drooping characteristic will supply less load.*
 c. the machine with more drooping characteristic will supply more load.
394. If field of one of two generators operating in parallel is made very weak, then it will
 a. not take any load.
 b. take major share of load.
 c. operate as a motor and run in the same direction.*
 d. operate as a motor and run in the opposite direction.
395. D C generators are connected to or disconnected from the bus-bar only under the floating condition. This is done to avoid
 a. burning of switch contacts.
 b. sudden loading of the prime-mover.
 c. mechanical jerk to the shaft.
 d. all of the above.*
396. The main factor that leads to unstable parallel operation of flat or over compounded dc generators is
 a. their rising voltage characteristics.*
 b. unequal series field resistance.
 c. unequal speed regulation of their prime-movers.
 d. their drooping voltage characteristics.
397. In the case of parallel operation of dc compound wound generators, for proper division of load from no load to full load it is essential that they should have the same
 a. kw output rating.
 b. percentage regulation.*
 c. series fields resistance.
 d. speed of operation.
398. In parallel operation of two dc compound generators provided with interpoles, the equalizing bar must be connected to
 a. inter pole field only.
 b. series field only.
 c. junction of series and interpole fields.*
 d. none of the above.
399. For parallel operation, the dc generators normally preferred are
 a. shunt.
 b. series.
 c. over-compound.
 d. under compound.
 e. both shunt and under compound.*
400. Equalizer bar is necessary for parallel operation of dc _____ generators.
 a. series
 b. shunt
 c. over-compound
 d. under compound
 e. shunt and under compound*
401. The construction of dc motor is
 a. similar to that of a dc generator.
 b. different from that of a dc generator.
 c. similar to that of a dc generator except frame construction.*
 d. none of the above.
402. A dc motor can be easily identified by looking at
 a. frame.
 b. commutator.*
 c. winding.
 d. yoke.
 e. shaft.
403. Which of the following is not necessarily the advantage of dc motors over ac motors ?
 a. Low cost.*
 b. Excellent torque and speed operating characteristics.
 c. Flexible speed control.
 d. None of the above.

404. The air gap between stator and armature of an electric motor is kept as small as possible in order to
- give stronger magnetic field.*
 - improve air circulation.
 - give high speed of rotation.
 - avoid over-heating of the motor.
 - reduce noise.

405. In a rotating electric machine, the torque produced will be maximum when
- torque angle is zero.
 - torque angle is 90° *.
 - two magnetic fields are aligned with each other
 - field strength are maximum and torque angle is zero.

406. In a dc machine, the angle between main field axis and brush axis is kept 90° in order to have
- constant torque
 - constant speed.
 - maximum torque.*
 - maximum speed.

407. In a rotating electrical machine, when the two magnetic fields are aligned with each other, the torque produced will be
- zero.*
 - constant.
 - maximum.
 - optimum.

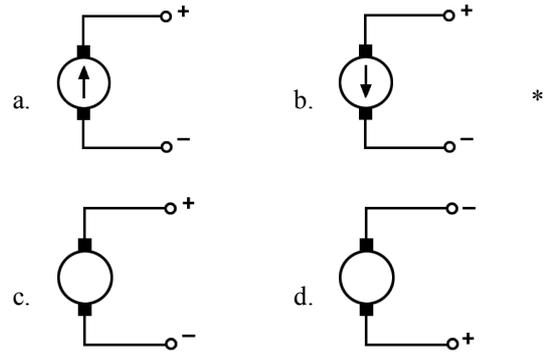
408. When a current carrying coil is placed in magnetic field as shown below, the coil will tend to move
- counter-clockwise
 - clockwise*
 - to the left.
 - to the right.



409. The magnitude of mechanical force in a dc motor is dependent on
- length of the conductor*
 - cross-sectional area of the conductor.
 - material of the conductor.
 - none of these.

410. When a dc machine is connected to the dc supply main it will produce
- emf in opposition to applied voltage.
 - unidirectional torque.
 - pulsating torque.
 - all of the above except (c)*

411. The figures given below indicate the direction of flow of armature current. Which figure corresponds to motor action ?



412. The current flowing through armature conductors of a dc motor is
- pulsating.
 - dc.
 - ac.*
 - none of these.

413. In dc machines
- induced emf and torque are produced in both motor and generators.
 - emf is induced in generator and torque is developed in motor.*
 - counter emf is induced in generator and counter torque is developed in motor.
 - none of the above.

414. The direction of armature current in a dc motor is
- the same as of the generated emf.
 - opposite to that of the generated emf.*
 - not dependent upon the direction of the armature emf.
 - none of the above.

415. The electromagnetic torque and rotation are in the same direction in case of
- both dc generators and dc motors.
 - dc generators.
 - dc motors.*
 - neither dc generators nor dc motors.

416. The emf induced in the armature of a dc motors is emf.
- back*
 - self induced
 - mutually induced
 - none of these

417. The relationship between back emf and applied voltage is case of a dc motor is given as
- $E_b = V + I_a R_a$
 - $E_b = V - I_a R_a$ *.
 - $E_b = V$
 - none of these

418. The current drawn by a dc motor armature is given as
- $I_a = \frac{V}{R_a}$
 - $I_a = \frac{E_b}{R_a}$
 - $I_a = \frac{V - E_b}{R_a}$ *
 - $I_a = \frac{E_b - V}{R_a}$

419. The current drawn by a dc motor at the starting instant will be

- a. V/R_a^* b. E_b/R_a
 c. $V/2R_a$ d. $2V/R_a$
420. A 200 V dc machine has an armature resistance of 0.5. If the full load armature current is 30 A, the induced emf where the machine run (i) as generator and (ii) as motor will be respectively
 a. 230V,170V b. 225V,175V
 c. 185V,215V d. 215V,185V*
421. A 220 V dc machine has an armature resistance of 1 Ω . If the full load current is 20 A, the difference in the induced voltages when the machine is running as a motor, and as a generator is
 a. 20 V* b. zero.
 c. 40V d. 50V
422. In a dc motor, energy conversion would not have been possible but for
 a. input energy from the supply.
 b. production of back emf in the armature.*
 c. use of commutator.
 d. rotation of the machine.
423. With the increase in speed of a dc motor
 a. both back emf as well as line current increase.
 b. both back emf as well as line current fall.
 c. back emf increases but line current falls.*
 d. back emf falls and line current increases.
424. When a dc motor is connected to normal dc voltage and then stopped forcibly,
 a. the motor will burn.*
 b. only the field winding will burn.
 c. nothing will happen to the motor.
425. If the back emf in a dc motor vanishes suddenly, the motor will
 a. start hunting
 b. burn*
 c. run at very high speed.
 d. run at very slow speed.
 e. not run at all.
 f. run nosily.
426. If a current-carrying coils is placed in a uniform magnetic field with its place perpendicular to the direction of magnetic induction then
 a. the net force and torque on the coil both, are zero.*
 b. the net force is zero but torque is finite.
 c. the net force is finite but torque is zero.
427. The output power of any electrical motor is taken from the
 a. armature.
 b. field.
 c. coupling mounted on the shaft.*
 d. motor frame.
428. The armature shaft must be able to withstand
 a. any unbalanced magnetic pull on the armature core.
 b. twisting strains due to transmission of torque.
 c. bending moment due to weight of the armature and commutator.
 d. all of the above.*
429. The output indicated on the name plate of any motor is always the
 a. gross power.
 b. power drawn in kva.
 c. power drawn in kw.
 d. output power at the shaft.*
430. A thicker wire is used in dc series motor field winding that in a dc shunt motor
 a. to create more flux.
 b. to reduce resistance.
 c. to carry large load current.
 d. both (b) and (c).*
431. In case of a conductively compensated dc series motor, the compensating winding is provided
 a. in series with the armature winding.*
 b. in parallel with the armature winding.
 c. in parallel with the field winding.
 d. as a separate unit.
432. The dc compound motors are generally
 a. level compound
 b. cumulative compound.*
 c. differential compound.
 d. none of these.
433. In a dc compound motor, the series field in comparison to shunt field will have
 a. more turns of thin wire.
 b. more turns of thick wire.
 c. less turns of thick wire.*
 d. less turns of thin wire.
434. In a dc compound motor the field regulator is provided to
 a. control the flux.*
 b. limit the armature current.
 c. demagnetize field partially.
 d. none of the above.

FILL IN THE BLANKS

1. An electrical generator is a machine which converts _____energy into electrical energy. (pneumatic, hydraulic, **mechanical**)
2. In a generator the energy conversion is based on the principle of the production of _____induced emf. (**dynamically**, statically)
3. The e.m.f of a generator will cause a current to flow if the conductor circuit is _____. (**closed**, opened)
4. The sliprings of a generator are to be _____each other. (away from, nearer to, **insulated from**)

5. The function of brushes in a generator is to collect the current induced in _____. (field magnet, sliprings, **armature coil**)
6. In a generator, brushes are pressed against the _____. (armature, magnet, **sliprings**)
7. When a coil is rotating in clock wise direction in a magnetic field, the _____ linked with it changes. (magnet, **magnetic flux**, armature)
8. When a coil is rotating in clock wise direction in a magnetic field, and if the plane of the coil is at right angles to the lines of flux, then the flux linked with coil is _____.(minimum, **maximum**, medium)
9. When a coil is rotating in clock wise direction in a magnetic field, and if the plane of the coil is at right angles to the lines of flux, then the rate of change of flux linkage is _____.(maximum, **minimum**, medium)
10. When a coil is rotating in clockwise direction in a magnetic field, and if the plane of the coil is horizontal, i.e. parallel to the lines of flux, then the flux linked with the coil is _____.(maximum, **minimum**, medium)
11. When a coil is rotating in clockwise direction in a magnetic field, and if the plane of the coil is horizontal, i.e. parallel to the lines of flux, then the rate of change of flux linkages is _____.(minimum, **maximum**, medium)
12. A current which is undergoing periodic reversal is known as _____current. (direct, **alternating**, surge)
13. In a generator, for making the flow of current unidirectional in the external circuit, the slip rings are replaced by _____. (brush, compensating windary, **commutator**)
14. The split-rings or commutators are made out of a conducting cylinder which is cut into two halves or segments _____each other. (connected to, **insulted from**)
15. In a generator, the yoke, the pole cores, the armature core and air gaps between the poles and the armature core forms the _____circuit. (**magnetic**, electrical, electronics)
16. Mechanical support for the poles of a generator is provided by _____. (pole shoes, armature core, **yoke**)
17. The magnetic flux produced by the poles of a generator is carried by the _____. (armature core, commutator, **yoke**)
18. In a gererator, spreading out of magnetic flux in the air gap is done by _____. (pole cores, **pole shoes**, pole coils)
19. In a generator, the reluctance of magnetic path is being reduced by _____. (**pole shoes**, pole cores, pole coils)
20. When current is passed through _____ coils, they electromagnetise the poles which produce the necessary flux. (armature, **pole**, load)
21. The function of armature core is to provide a path of _____reluctance to the flux passing though armature from a N-Pole to a S-Pole. (high, very high, **very low**)
22. In a generator, if the armature core lamination is thinner, then the resistance offered to the indueed e.m.f. is _____. (lesser, **greater**)
23. In a generator, the $I^2 R$ in armature core will be lesser, if the laminations in armature core is _____. (thicker, **thinner**)
24. The function of the commutator in a generator is to facilitate the collection of current from the _____. (armature core. **armature conductors**, pole coils)
25. The brushes of a generator usually made of _____. (**carbon**, zinc, brass)
26. In the armature winding, when the armature conductors are divided into two paralld paths, then that winding is known as _____winding. (**wave**, lap, compensating)
27. The number of conductors in each path of a 4 pole wave wound generator having 40 armature conductor will be _____. (10, **20**, 5)
28. In armature widning, when armature conductors are divided into as many parallel paths as the number of poles of the generator, then that winding is known as _____winding. (wave, **lap**, compensating)
29. The number of conductors in each path of a 4 pole lap wound generator having 40 armature conductor will be _____.(**10**, 20, 5)
30. In a lap winding armature, if there are P poles and Z armature conductors, then there are P parallel paths, each consisting of Z/P conductos connected in _____. (parallel, **series**, series parallel)
31. For calculating resistance of whole armature winding, we use the formula $R = \frac{pl}{S} \times Z$, where S is the _____. (length, no. of parallel path, **cross-section**)
32. Generator are usually classified according to the way in which their fields are _____.(constructed, divided, **excited**)
33. Field magnets of a separately excited generator are energised by an independent external source of _____current. (**direct**, alternating, pulsating)

34. In a self excited generator, the field magnets are energised by the current produced by _____. (battery, other generator, **same generator**)
35. In a self excited generator, when the armature is rotated, in the beginning, some e.m.f. will be induced in it because of _____. (low voltages, low current, **residual magnetism**)
36. Different types of self excited generators are named according to the manner in which their _____ are connected to the armature. (brushes, commutator, **field coils**)
37. In a series wound dc generator, the field windings are connected in series with _____. (brushes, commutators, **armature conductors**)
38. In a short shunt compound generator, the shunt windings are connected across the _____. (series coil, **armature**, armature and series coil)
39. In a long shunt compound across the _____. (series coil, armature, **armature and series coil**)
40. Due to the rotation of the iron core of the armature of a generator in a magnetic field, there are some losses in the core and are known as _____. (**iron losses**, copper losses, mechanical losses)
41. The armature core of a generator undergoes one complete cycle of magnetic reversal after passing under _____ of poles. (**one pair**, two pair, three pair)
42. The hysteresis loss of a generator is depends upon volume and grade of _____. (copper, **iron**, brush)
43. The e.m.f. induced in armature core, due to its rotation, is though small, sets up a large current in the body of the core due to its small _____. (weight, area, **resistance**)
44. The eddy current loss of a generator would be considerable if _____ iron core were used. (**solid**, laminated)
45. To reduce the eddy current loss of a generator, the armature core is built up of _____. (**thin laminations**, thick laminations)
46. The eddy current loss of a generator varies directly as the square of the _____ of laminations of armature core. (length, area, **thickness**)
47. The eddy current of a generator is not only reduce the efficiency of the generator, but also increase the _____ of the armature core. (weight, current capacity, **temperature**)
48. For reducing the hysteresis loss of a generator, those metals are to be chosen for the armature core which have a _____ hysteresis coefficient. (**low**, high, very high)
49. The magnetic losses are practically constant for shunt and compound wound generators because _____ is approximately constant. (**field current**, armature current, load current)
50. Air-friction or windage loss of rotating armature can be termed as _____ losses. (magnetic, copper, **mechanical**)
51. Magnetic and mechanical losses of a generator are collectively known as _____ losses. (constant, variable, **stray**)
52. Armature copper loss is known as _____ loss. (constant, **variable**, stray)
53. Armature copper loss is known as variable loss because it varies with the _____ current. (field, armature, **load**)
54. For a generator, the ratio of total watts generated in armature and mechanical power supplied, is known as _____ efficiency. (**mechanical**, electrical, commercial)
55. For a generator, the ratio of watts available in load circuit and total watts generated is known as _____ efficiency. (mechanical, **electrical**, commercial)
56. For a generator the ratio of watts available in load circuit and mechanical power supplied is known as _____ efficiency. (mechanical, electrical, **commercial**)
57. In a generator, when variable loss is equal to constant loss, the efficiency of the generator will be _____. (**maximum**, minimum)
58. By armature reaction is meant the effect of magnetic field set up by _____ on the distribution of flux under main poles of a generator. (field current, **armature current**, load current)
59. When the armature current of a d.c generator is increased, the demagnetising component of armature current is _____. (**increased**, decreased, remain same)
60. A few extra ampere-turns to the main field winding is added in a generator to neutralize the _____ effect of armature reaction. (**demagnetising**, distorting)
61. By using compensating winding, the _____ effect of armature reaction is neutralized. (demagnetising, **distorting**)
62. Compensating windings in a d.c. generator are connected in _____ with armature. (**series**, parallel, series-parallel)
63. Compensating windings in a d.c. generator are

- embedded in slots in the _____. (armature, commutator, **pole shoes**)
64. In a d.c. generator, the process by which current in the short circuited armature coil is reversed while it crosses the M.N.A is called _____. (armature reaction, **commutation**, polarization)
65. In a d.c. generator, the brief period during which armature coil remain short circuited is known as _____. (shorting period, **commutation period**, reaction period)
66. The main factor which does not allow the armature current to completely reverse its direction within commutation period is the production of _____ in the conductors. (spark, surge voltage, **reactance voltage**)
67. Interpoles of a d.c. generator are connected in such a way that they will carry full _____. (field current, **armature current**, load current)
68. The polarity of interpoles in a d.c. generator is the _____ as that of the main pole ahead in the direction of rotation. (**same**, opposite)
69. Interpoles are used in a d.c. generator, to make the current reversal in armature coil _____. (prolonged, with spark, **sparkless**)
70. The open circuit characteristic of a d.c. generator is also known as _____ characteristic. (total, external, **magnetic**)
71. The shape of curve for open circuit characteristic of a d.c. generator is _____ for separately excited and self-excited generators. (different, **same**)
72. The curve which shows the relation between actually induced e.m.f. in armature and the armature current is known as _____ characteristic of a d.c. generator. (open circuit, **internal**, external)
73. In the internal characteristic of d.c. generator, the actually induced e.m.f. in armature means the e.m.f. _____ allowing for the demagnetising effect of armature reaction. (**after**, before)
74. The external characteristic curve of d.c. generator lies _____ the internal characteristic curve. (above, **below**)
75. To find out open circuit characteristic of d.c. generator, the field excitation current should be _____. (constant, **variable**)
76. During finding out the open circuit characteristic of generator, in the beginning when exciting current is zero, then also we find some e.m.f. are generated because of _____. (pole structure, pole coil, characteristic, **residual magnetism**)
77. At low flux densities, the reluctance of iron path of a generator is _____. (maximum, medium, **negligible**)
78. The speed of a shunt generator is that speed for which the given shunt field resistance represents _____ resistance. (total, no, **critical**)
79. A series generator is a _____ voltage generator. (**variable**, constant)
80. A series generator is suitable for _____ the supply voltage. (generating, **boosting up**)
81. A shunt generator should be allowed to build up its voltage _____ loading. (after, **before**)
82. A shunt generator gives its greatest voltage at _____ (minimum load, maximum load, **no load**)
83. In a d.c. generator, the change in voltage when the load is reduced from rated value to zero, is known as _____ of d.c. generator. (external characteristic, internal characteristic, **voltage regulation**)
84. If no load voltage of a d.c. generator is 24 V and rated load voltage is 22V, then the regulation of the d.c. generator is _____ (19.1%, **9.1%**, 91.1%)
85. The external characteristics of long and short shunt compound generators are _____ (totally different, **almost equal**)
86. If the series and shunt fluxes of a compound wound generator are assist each other, the generator is called _____ compounded. (differentially, **cumulatively**)
87. If the series and shunt fluxes of a compound wound generator are opposing each other, then the generator is called _____. (cumulatively., compounded, **differentially compounded**)
88. The level of compounding in a cumulatively-compound generator can be altered by changing the amount of current passing through the _____ field winding. (**series**, parallel, both file)
89. In case of a flat-compounded generator, the terminal voltage is _____ from no load to full load. (**not constant**, constant)
90. An electric motor is a machine which converts electrical energy into _____ energy. (chemical, pneumatic, **mechanical**)

91. When a _____ conductor is placed in a magnetic field, it experiences a mechanical force. (heavy, thin, **current-carrying**)
92. Due to the effect of armature flux on the main flux, the distribution of flux density across the armature tooth section is _____. (equal, **unequal**)
93. When the speed of the motor is increased, its back e.m.f will _____. (**increase**, decrease, remains same)
94. In a DC motor, out of the armature input, some is wasted as _____ and rest is converted into mechanical work within the armature. (hysteresis loss, copper loss, **I²R loss**)
95. The turning or twisting moment of a force about an axis is known as _____. (speed, velocity, **torque**)
96. The torque is measured by the product of the force and the _____ at which this force acts. (area, diameter, **radius**)
97. The torque which is available for doing useful work in a d.c. motor is known as _____ torque. (total, **shaft**, lost)
98. The speed of a d.c. motor is _____ proportional to the back e.m.f. (**directly**, inversely)
99. The speed of a d.c. motor is inversely proportional to the _____. (back e.m.f., applied voltage, **flux**)
100. The speed regulation of a d.c. motor is defined as the change in speed, when the load on the motor is reduced from rated value to _____. (halt, minimum, **zero**)
101. The characteristic of a d.c. motor, when it is considering the relation between torque and armature current, is known as _____ characteristic. (**electrical**, mechanical, external)
102. The characteristic of a d.c. motor, when it is considering the relation between speed and torque, is known as _____ characteristic. (electrical, **mechanical**, external)
103. Series motors are used where _____ starting torque is required. (low, medium, **high**)
104. In a series d.c. motor, the speed varies _____ as armature current. (directly, **inversely**)
105. If a series d.c. motor is started without some mechanical load, then it will develop _____ speed. (little, normal, **excessive**)
106. In a series d.c. motor, if speed is high, then the torque is _____ (high, having no effect, **small**)
107. The d.c. motor which is preferably used for shunt machine is _____ motor. (series, **shunt**, compound)
108. In a cumulative compound d.c. motor. the series excitation _____ shunt excitation. (**helps**, oppose, having no effect on)
109. For driving heavy machine tools which have to take sudden deep cuts quite often, the motor which is preferably used is _____ motor (shunt, series, **cumulative compound**)
110. In a differential-compound d.c. motor, the series excitation _____ shunt excitation. (**oppose**)
111. Due to weakening of the field, with increase in armature current, there is a tendency towards speed instability occurs in case of a _____ motor. (series, cumulative-compound, **differential compound**)
112. In split-field series motor, the field winding is split into two electrically separate sections, thereby establishing magnetic field flowing in _____ direction. (same, **opposite**)
113. In split-field series motor, one of the two windings is used for each direction of rotation and is controlled by a _____ switch. (single-pole single throw, **single-pole double throw**, double-pole double throw)
114. The d.c. motors used for actuators are normally _____ (split-field shunt wound, **split-field series wound**, split field compound wound)
115. The ball bearing method for extension and retraction of linear actuator is normally adopted for _____ actuators. (**large**, small)
116. In the ball bearing method for extension and retraction of linear actuator, the space between grooves is filled with _____. (iron balls, **steel balls**, nicked balls)
117. The majority of actuators are fitted with electro magnetic brakes to prevent over travel when the motor is _____. (**switched-off**, switched-on)

118. The brakes of an actuator is spring loaded to "On" condition when the motor is _____. (energised, **de-energised**)
119. Multi-plate type friction clutches are used on _____actuators. (small, **large**)
120. The output terminals of an a.c. generator is marrked to show the _____. (frequency, R.M.S value, **phase sequence**)
121. The phases of aircraft a.c. generator are normally connected in _____connection. (**star**, delta)
122. The power ratings of a.c. generators are generally given in _____. (**kilovolt-amperes**, kilo watts)
123. Most a.c. generator are designed to takea proportion of the _____component of current through their windings. (active, **reactive**)
124. When an a.c. generator is specified as _____at 0.8 P.F, it does men\an that the product of volts and amperes under all conditions of P.F. must not exceed 40 KVA. (32 KVA, 38 KVA, **40 KVA**)
125. The frequency-wild generator can be used in resistive load circuit because the resistance to alternating current remains substantially constant and is _____of frequency. (dependent, **independent**)
126. The Stator winding of frequency-wild generator is _____connected. (**Star**, delta)
127. In a frequency-wild generator, to suppress interference in the reception of radio signals _____are used. (inductors, **capacitors**, resistors)
128. The frequency-wild generator is cooled by _____. (fan, oil, **ram air**)
129. In constant speed drive unit, the oil for system operation is supplied from a reservoir via charge pumps _____the unit. (from outside, **within**)
130. In a C.S.D. the charge oil is ported to fixed displacement unti by_____ (reservion, governor, **variable displacement unit**)
131. In a C.S.D., the supply of charge oil to the unit's control valve is controlled by governor valve which is driven by _____gear. (input, **output**)
132. A _____ motor should not be used where there is a possibility of shading off load totally. (shunt, **series**, cumulative compound)
133. For electric locomotive _____motor is used. (**series**, shunt, differential-compound)
134. For conveyors, the motor, which is preferrably used is _____. (series, shunt, **cumulative-compound**)
135. A cumulative-compound motor is normally used in _____. (lathe, crane, **elevator**)
136. In case of a d.c. motor the raito of motor output to motor input is known as _____efficiency. (**commercial**, electrical, mechanical)
137. In case of a d.c. motor the ratio of driving power in armature to motor input is known as _____efficiency. (commercial, **electrical**, mechanical)
138. In case of a d.c. motor the raito of motor output to driving power in armature is known as _____efficiency. (commercial, **mechanical**, electrical).



CHAPTER - 9

KNOWLEDGE OF THE CONSTRUCTION, PRINCIPLE OF OPERATION AND CHARACTERISTICS OF AC GENERATORS AND MOTORS

1. When the fixed displacement unit in a C. S. D. functions as a hydraulic motor, then its direction of rotation and speed is determined by
 - a. Its displacement
 - b. Its weight
 - c. The volume of oil pumped to it *
 - d. None of the above
2. When the input speed in a C.S.D. is sufficient to produce the required output speed, the fixed displacement unit is supplied with
 - a. Maximum charged oil
 - b. Minimum charged oil
 - c. No charged oil *
 - d. Either (a) or (b)
3. The disconnection of a C.S.D. transmission system following a malfunction may be accomplished
 - a. Mechanically
 - b. Electro-pneumatically
 - c. Electro-mechanically
 - d. All of the above *
4. The disconnection of a C.S.D. transmission performed by electro-mechanically is initially activated by a
 - a. Capacitor
 - b. Solenoid *
 - c. Thermal switch
 - d. None of the above
5. Re-setting of a disconnected C.S.D. transmission system can be done
 - a. In air
 - b. On ground when engine running
 - c. On ground when engine not running *
 - d. None of the above
6. Re-setting of a disconnected C.S.D. transmission system can be done by
 - a. Pulling out the re-set handle *
 - b. Pushing in the reset handle
 - c. Either (a) or (b)
 - d. None of the above
7. A constant speed drive generator is mainly consist of
 - a. Exciter
 - b. Rotating rectifier assembly
 - c. Main generator
 - d. All of the above *
8. The power for the main generator field of a constant speed drive generator is supplied by
 - a. A d.c. exciter from within the generator itself
 - b. An a.c. exciter from within the generator itself *
 - c. A d.c. exciter from outside the generator itself
 - d. An d.c. exciter from outside the generator itself
9. The total number of brushes fitted in a constant speed drive generator is
 - a. 6
 - b. 12
 - c. 18
 - d. Nil *
10. The rotor of the main generator of a constant speed drive generator is having
 - a. 2 poles
 - b. 4 poles
 - c. 8 poles *
 - d. 16 poles
11. The purpose of damper winding in a constant speed drive generator is
 - a. To assist main pole
 - b. To oppose main pole
 - c. To provide an induction motor effect on generator*
 - d. None of the above
12. The constant speed drive generator is getting cooled by
 - a. Ram air *
 - b. Fan
 - c. Oil
 - d. None of the above
13. In a constant speed drive generator a thermally operated over-heat detector switch is mounted on
 - a. Stator of the exciter
 - b. Stator of the main generator *
 - c. Rectifier assembly
 - d. Rotor of the exciter
14. An integrated drive generator is getting cooled by
 - a. Ram air
 - b. Fan *
 - c. Oil
 - d. None of the above
15. The excitation of the rotor field of a frequency-wild generator is provided by
 - a. Aircraft's main d.c. bus bar
 - b. Rectifier a.c.
 - c. Both (a) and (b) *
 - d. None of the above
16. The current compounding section of a frequency-wild generator is consist of
 - a. Switch

- b. Three phase current transformer
c. Rectifier
d. Both (b) and (c) *
17. The primary windings of the compounding transformer of a frequency-wild generator is connected in series with the
a. Compounding rectifier
b. Three phase of generator *
c. Either (a) or (b)
d. Both (a) and (b)
18. The secondary windings of the compounding transformer of a frequency-wild generator is connected in series with the
a. Compounding rectifier *
b. Three phase of generator
c. Either (a) or (b)
d. Both (a) and (b)
19. In the field excitation of frequency-wild generator, the current signal to the excitation rectifier is provided by
a. Aircraft d.c. bus bar
b. Three phase transformer
c. Voltage regulator *
d. Either (a) or (b)
20. In a frequency-wild generator, the direct current proportional to load current is supplied to the rotor field windings by
a. Aircraft's d.c. bus bar
b. Voltage regulator
c. Excitation rectifier
d. Compounding transformer and rectifier *
21. The stator of the exciter of constant speed drive generator consist of
a. Two shunt field windings
b. A stabilizing winding
c. Six permanent magnets
d. All of the above *
22. In the excitation of constant speed drive generator, in order to produce a field supplementary to that of the permanent magnets, the output of generator is fed back to shunt field winding of excitor through
a. voltage regulator * b. rectifier assembly
c. stablizing winding d. none of the above
23. During the initial stages of generator operation, the current flow to the excitor is passes through
a. Both the shunt field windings
b. one of the shunt field winding *
c. eithe a) or b)
d. none of the above
24. In a three phase induction motor, the difference between the synchronous speed and the actual speed of rotor is known as
a. torque
c. turn
b. slip *
d. none of the above
25. When an induction motor is start rotating, then the frequency of rotor current depends upon
a. actual speed
c. slip - speed *
b. synchronous speed
d. none of the above
26. The starting torque per ampere of a squirrel cage induction motor is
a. high
c. very poor *
b. very high
d. either a) or b)
27. In case of a slip - ring induction motor, by adding torque is increased at the begining because
a. the effect of improved power factor predominates the current decreasing effect of impedance*
b. the effect of increased impedance predominates the effect of improved power factor
c. both a) and b)
d. none of the above
28. In case of a slip ring induction motor, by adding external resistance in rotor circuit, the starting torque is increased at the begining but after a certain point, the torque start decreasing because
a. the effect of improved power factor predominates the current decreasing effect of impedance
b. the effect of increased impedance predominates the effect of improved power factor *
c. both a) and b)
d. none of the above
29. The starting torque of an induction motor will be maximum when the rotor resistance is
a. half of the rotor reactance
b. double of the rotor reactance
c. one fourth of the roto reactance
d. equal to the rotor reactance *
30. In an induction motor, the value of emf induced in the rotor at stands till is maximum, because :
a. the relative speed between the rotor and the revolving stator flux is maximum *
b. the relative speed between the rotor and the revolving stator flux is minimum
c. either a) or b)
d. none of the above
31. In an induction motor, when rotor starts running, the relative speed between it and rotating stator flux is
a. increased
c. remaining same
b. decreased *
d. none of the above
32. In an induction motor, when the rotor speed is equal to the speed of stator flux, then the speed of the motor will be

- a. minimum b. maximum
c. zero * d. none of the above
33. In case of an induction motor, the natural change in its speed from no - load without using any speed controlling apparatus is known as
a. speed variation b. speed control
c. speed regulation * d. none of the above
34. The percentage speed regulation of an induction motor having no load speed of 980 rpm and full load speed of 940 rpm is
a. 2.25 % b. 2.5 %
c. 4.25 % * d. 4.5 %
35. In case of an induction motor at no - load the slip is
a. high b. very high
c. very small * d. either a) or b)
36. In case of an induction motor, when the load is increased, the rotor slip will
a. increase * b. decrease
c. remain same d. none of the above
37. The speed regulation of a squirrel cage induction motor is
a. high b. very high
c. very small * d. none of the above
38. At start up, the squirrel cage rotor has large reactance because
a. the frequency of its induced currents is the highest*
b. the frequency of its induced currents is the lowest
c. either a) or b)
d. none of the above
39. The starting current drawn by an squirrel cage induction motor is having
a. a very large magnetising component
b. a very small in phase component
c. a very large in phase component
d. both a) and b) *
40. The starting current drawn by an squirrel cage induction motor is having a very large magnetising component but a very small in - phase component because of
a. high reluctance of stator magnetic circuit
b. low reluctance of stator magnetic circuit
c. large reactance of rotor
d. both a) and c) *
41. At the start - up a squirrel cage induction motor has a lagging power factor of approximately
a. 0.05 * b. 0.1
c. 0.9 d. 0.7
42. When a squirrel cage induction motor is running at no load, the motor has a lagging power factor of approximately
a. 0.05 b. 0.1 *
c. 0.9 d. 0.7
43. The lagging power factor of a squirrel cage induction motor at rated load is approximately
a. 0.1 b. 0.05
c. 0.9 * d. 0.7
44. The stator iron loss of an induction motor is depends on
a. supply frequency
b. flux density in the iron core
c. both a) and b) *
d. none of the above
45. For starting of squirrel cage induction motor the method used is
a. direct on line starting
b. auto transformer starting
c. store delta starting
d. all the above *
46. Direct on line starting system for squirrel cage induction motor is normally used on motors having power rating
a. below 20 kW b. above 20 kW
c. below 5 kW * d. above 5 kW
47. While using direct on line starting system on squirrel cage induction motor, the motor will have starting current which is about
a. same as the full load current
b. double of the full load current
c. 3 to 4 times of full load current
d. 4 to 7 times of the full load current *
48. While starting squirrel cage induction motors with direction on line starting system, the voltage drop in the supply cables will be
a. high * b. low
c. either a) or b) d. none of the above
49. The rotor conductors of an squirrel cage induction motor is made of
a. copper or aluminium wires
b. copper or aluminium bars *
c. manganin or tungsten wires
d. manganin or tungsten bars
50. For starting of squirrel - cage induction motor, it is not possible to add any external resistance in series with rotor circuit because of
a. rotor bars are connected to slip rings
b. rotor bars are heavy

- c. rotor bars are permanently short circuited on themselves *
- d. none of the above
51. The rotor of phase wound induction motor is wound for as many poles as
- the number of stator poles *
 - the double of stator poles
 - the half of stator poles
 - either b) or c)
52. When a phase wound induction motor is running under normal condition, the slip rings are automatically
- open circuited
 - short circuited *
 - lifted
 - none of the above
53. In an induction motor, when the 3 phase stator winding is energised by a 3 phase supply, then the resultant flux produced rotates around stator
- with high speed
 - with low speed
 - with synchronous speed *
 - either a) or b)
54. In an induction motor, when the 3 phase stator winding is energised by a 3 phase supply, then the magnitude of resultant flux will be
- $1.5 \phi_m$ *
 - $2.5 \phi_m$
 - $0.5 \phi_m$
 - $6 \phi_m$
55. The frequency of the induced emf in the rotor of an induction motor of stand still is
- half of the supply frequency
 - same as the supply frequency *
 - double of the supply frequency
 - one fourth of the supply frequency
56. The magnitude of the induced emf in the rotor of an induction motor is proportional to
- relative velocity between flux and conductor *
 - relative velocity between supply voltage and conductor
 - relative velocity between supply frequency and conductor
 - none of the above
57. The direction of rotor current of an induction motor is given by
- Flemings left hand rule
 - Flemings right hand rule
 - Lenz's law *
 - Faraday's law
58. The rotor of an induction motor is running at a speed which is
- equal to the speed of the stator field
 - more than the speed of the stator field
 - less than the speed of the stator field *
 - either a) or b)
59. When 50% tapping of an auto - transformer starter is used for starting of a squirrel cage induction motor then the starting torque developed by the motor will be
- 25 % of full load torque *
 - 50 % of full load torque
 - 75 % of full load torque
 - none of the above
60. When the switch of the auto transformer starter of squirrel cage induction motor is put at 'RUN' position then the motor will be connected
- directly to the supply *
 - to the supply through auto transformer
 - either a) or b)
 - none of the above
61. Tapping of an auto transformer starter can be used for starting of a squirrel cage induction motor is
- 50 %
 - 65%
 - 80 %
 - all the above *
62. If 50 % tapping of an auto transformer starter is used for starting of a squirrel cage induction motor
- 25 % of full load torque *
 - 50 % of full load torque
 - 75 % of full load torque
 - none of the above
63. While a squirrel cage induction motor is started by a star delta starter, the voltage of each phase during starting will be
- same as the line voltage
 - $1/\sqrt{3}$ of the line voltage *
 - $\sqrt{3}$ of the line voltage
 - half of the line voltage
64. While a squirrel cage induction motor is started by a star - delta starter, the starting torque is reduced to
- 50 % of normal value
 - 28 % of normal value
 - 33.3 % of normal value *
 - 48 % of normal value
65. A synchronously rotating flux can be produced by a
- 1 - phase stator winding
 - 2 - phase stator winding
 - 3 - phase stator winding
 - either b) or c) *
66. The method to make a single phase induction motor self starting is
- split phase method
 - capacitor method
 - shaded pole method
 - all the above *
67. The split phase induction motors are started by two phase motor action with the help of
- capacitors
 - inductors

- c. an additional winding * d. none of the above
68. In a split phase induction motor, the phase difference between the currents drawn by running and starting windings can be made sufficiently large by making
- both starting and running winding highly resistive
 - both starting and running winding highly reactive
 - starting winding highly resistive and running winding highly reactive *
 - starting winding highly reactive and running winding highly resistive
69. In the split phase induction motor, the centrifugal switch disconnects the starting winding from the supply when the motor reaches
- 25 to 30 % of its full load speed
 - 40 to 50 % of its full load speed
 - 70 to 80 % of its full load speed *
 - 100 % of its full load speed
70. The starting torque of a split phase induction motor is about
- 70 to 80 % of full load torque
 - 150 to 200 % of full load torque *
 - 300 to 350 % of full load torque
 - 650 to 700 % of full load torque
71. The starting current of a split - phase induction motor is about
- double of the full load current
 - half of the full load current
 - 3 to 4 times of full load current
 - 6 to 8 times of full load current *
72. In the washing machines, the motor which is normally used is
- split phase induction motor *
 - capacitor start induction run motors
 - capacitor start and run motors
 - shaded pole motors
73. The split phase induction motors are generally available in the
- 25 to 50 W range
 - 50 to 250 W range *
 - 100 to 500 W range
 - 150 to 1000 W range
74. In a capacitor start induction run motor, because of the large angle between currents of starting winding and main winding, the starting torque of the motor is
- small
 - large *
 - medium
 - either a) or c)
75. In a capacitor start induction run motor, the capacitor is connected in series with the
- starting winding *
 - main winding
 - rotor winding
 - all the above
76. The type of the capacitor used in a capacitor start induction run motor is
- paper capacitor
 - mica capacitor
 - electrolyte capacitor *
 - ceramic capacitor
77. During starting of capacitor start induction run motors when the motor runs up to nearly 75 % of its full load speed, the centrifugal switch cuts off the
- starting winding only
 - capacitor only
 - both a) and b) *
 - none of the above
78. Capacitor start induction run motors are generally having a starting torque of about
- 100 % of the full load torque
 - 250 % of the full load torque
 - 350 % of the full load torque
 - 450 % of the full load torque *
79. The capacitor start induction run motors are generally manufactured in the
- 50 to 100 W range
 - 100 to 200 W range
 - 50 to 200 W range
 - 100 to 500 W range *
80. Generally the motor used for swimming pool pump is
- split phase induction motor
 - capacitor start induction run motor *
 - capacitor start and run motor
 - shaded pole motor
81. The advantage of leaving the capacitor permanently in the circuit of a capacitor start and run motor is
- improvement of over load capacity of the motor
 - a higher power factor
 - higher efficiency
 - all the above *
82. The torque of a capacitor start and run motor is
- 50 to 100 % of the full load torque *
 - 100 to 150 % of the full load torque
 - 200 to 250 % of the full load torque
 - 400 to 450 % of the full load torque
83. In a two value capacitor start and run motor, the capacitors used as
- high value capacitance for run and low value capacitance for start
 - high value capacitance for start and low value capacitance for run *
 - both high value capacitance for start and run
 - both low value capacitance for start and run
84. The motor which is normally used in refrigerators is
- split phase induction motor
 - capacitor start induction run motor

- c. capacitor start and run motor *
d. shaded pole motor
85. In a shaded pole motor, the necessary phase splitting is produced by
a. additional winding b. capacitance
c. induction * d. none of the above
86. The shaded pole motors are having
a. salient poles on the stator
b. squirrel cage type rotor
c. both a) and b) *
d. none of the above
87. In shaded pole motors, the coil used as a shaded coil is generally made of
a. tin b. copper *
c. aluminium d. zinc
88. In a shaded pole motor when an alternating current is passed through the field winding surrounding the whole pole, the magnetic axis of the pole shifts from the
a. shaded part to the unshaded part
b. unshaded part to the shaded part *
c. either a) or b)
d. none of the above
89. In a shaded pole motor the rotation is obtained by
a. shifting of the magnetic axis *
b. rotation of the magnetic flux
c. both a) and b)
d. none of the above
90. The rotor of a shaded pole motor will rotate in a direction from
a. unshaded part to shaded part *
b. shaded part or unshaded part
c. either a) or b)
d. none of the above
91. Shaded pole motors are generally available in
a. 5 to 50 W ratings * b. 50 to 100 W ratings
c. 100 to 200 W rating d. 100 to 400 w ratings
92. The number of brushes fitted in a shaded pole motor is
a. 2 b. 4
c. 6 d. nil *
93. The efficiency of shaded pole motors are ranging from
a. 5 to 35 % * b. 15 to 50 %
c. 35 to 55 % d. 35 to 75 %
94. The motor which can be available with a speed less than one revolution per month is
a. split phase induction motor
- b. capacitor shart induction run motor
c. capacitor start and run motor
d. shaded pole motor *
95. The brushes of a repulsion motor are
a. connected to the supply
b. not connected to the supply
c. short circuited
d. both b) and c) *
96. In a repulsion motor when the brush axis is in line with the field axis, then the torque developed by the armature is
a. maximum b. minimum
c. zero * d. none of the above
97. In a repulsion motor when the brush axis is in line with the neutral axis, then the torque developed by the armature is
a. maximum b. minimum
c. zero * d. none of the above
98. A repulsion motor develops torque which is
a. in the direction in which brushes are shifted from field axis *
b. opposite the direction in which brushes are shifted from field axis
c. either a) or b)
d. none of the above
99. The rotor winding of a repulsion motor is wound like a
a. d. c. armature * b. squirrel cage
c. either a) or b) d. none of the above
100. The brushes of a repulsion motor remains in contact with the commutator
a. during starting only b. during running only
c. at all the times * d. none of the above
101. The torque of a repulsion motor is almost equal to the
a. field flux b. square of the field flux *
c. half of the field flux d. none of the above
102. In a repulsion motor, the magnitude of the starting torque as well as speed can be varied by varing the angle of shift of the
a. neutral axis from brush axis
b. netral axis from field axis
c. brush axis from field axis *
d. none of the above
103. A repulsion start induction run motor is having
a. constant speed characteristic *
b. variable speed characteristic
c. both a) and b)
d. none of the above

104. In a repulsion start induction run motor, for short circuiting the commutator
- copper wire is used
 - centrifugal mechanism is used *
 - capacitor is used
 - none of the above
105. During starting of a repulsion start induction run motor, the centrifugal mechanism is short circuiting the commutator, when the motor has reached nearly
- 25 % of its full load speed
 - 50 % of its full load speed
 - 75 % of its full load speed *
 - 100 % of its full load speed
106. The disadvantage of repulsion start induction run motor is
- require more maintenance
 - are relatively more expensive
 - cause radio interference during starting
 - all the above *
107. The rotor winding in a repulsion - induction motor is
- one squirrel cage type
 - one dc winding type
 - both a) and b) *
 - none of the above
108. A universal motor can operate on
- ac
 - dc
 - both a) and b) *
 - none of the above
109. The power rating of a universal motor is varies from
- 5 to 50 W
 - 5 to 200 W *
 - 50 to 500 W
 - 100 to 500 W
110. The adverse effects of a d.c. series motors are minimised in a universal motor by using
- few series field turn
 - low reluctance magnetic path
 - high reluctance magnetic path
 - both a) and b) *
111. The direction of rotation of a universal motor can be reversed by
- reversing the current flow through armature
 - reversing the current flow through field
 - reversing the current flow through both the armature and field winding
 - either a) or b) *
112. The motor which is generally used in a sewing machine is
- split phase induction motor
 - capacitor start and run motor
 - repulsion motor
 - universal motor *
113. The stator of a reluctance synchronous motor carries
- main winding
 - starting winding
 - either a) or b)
 - both a) and b) *
114. In a split phase type reluctance synchronous motor, for cutting the startings winding
- centrifugal switch is used *
 - capacitor is used
 - inductor is used
 - none of the above
115. Reluctance synchronous motors are generally built in a rating of
- 5 to 50 W
 - 10 to 25 W *
 - 50 to 100 W
 - 100 to 200 W
116. In case of a reluctance synchronous motor, when power supply is switched on, the motor starts and accelerates like a
- squirrel cage motor *
 - capacitor start and run
 - shaded pole motor
 - none of the above
117. The pull in action in a reluctance synchronous motor takes place due to
- attraction between revolving stator poles and magnetised rotor poles *
 - repulsion between revolving stator poles and magnetised rotor poles
 - either a) or b)
 - none of the above
118. The reluctance synchronous motor adjusts its torque angle for a change in load in a similar way to that of a
- three phase induction motor
 - single phase induction motor
 - three phase synchronous motor *
 - none of the above
119. The motor which is normally used in the recording instrument is
- capacitor start and run motor
 - repulsion induction motor
 - universal motor
 - reluctance synchronous motor *
120. The hysteresis synchronous motors are usually made in a power rating of
- 2 to 4 W *
 - 5 to 30 W
 - 10 to 100 W
 - 50 to 150 W
121. In a split phase hysteresis synchronous motor the stator has
- one winding
 - two windings *
 - three windings
 - four windings
122. In a split phase hysteresis synchronous motor both the stator windings are connected to single phase

- supply during
 a. starting b. running
 c. either a) or b) d. both a) and b) *
123. The rotor of the hysteresis synchronous motor is consists of
 a. two or more outer rings
 b. cross bar
 c. wire wound armature
 d. both a) and b) *
124. The cross bars which are used in the rotor of a hysteresis synchronous motor is having
 a. high retentivity and low permeability
 b. low retentivity and high permeability
 c. high retentivity and permeability *
 d. low retentivity and permeability
125. The starting of a hysteresis synchronous motor is similar to
 a. an induction motor * b. a synchronous motor
 c. a repulsion motor d. none of the above
126. Most synchronous motors run at speeds ranging from
 a. 50 to 200 r.p.m. b. 50 to 1000 r.p.m. *
 c. 150 to 1200 r.p.m. d. 150 to 1800 r.p.m.
127. The speed of a synchronous motor can be changed by changing
 a. supply voltage b. supply frequency *
 c. exciter current d. none of the above
128. A synchronous motor is capable of being operated in
 a. lagging power factor only
 b. leading power factor only
 c. both a) and b) *
 d. none of the above
129. The dc excitation is provided to the rotor of synchronous motor during
 a. begining of the starting
 b. when rotor speed reached near or equal to synchronous speed *
 c. either a) or b)
 d. none of the above
130. A synchronous motor is either to run synchronously or not at all, because of
 a. construction of stator
 b. construction of rotor
 c. input power supply
 d. magnetic interlocking of stator and rotor poles *
131. If the load of a synchronous motor is increased, the rotor progressively tends to full back
 a. in speed b. in phase *
- c. either a) or b) d. both a) and b)
132. When the load of a synchronous motor is increased, the motor will
 a. run at low speed
 b. run at high speed
 c. run at synchronous speed *
 d. none of the above
133. In a synchronous motor a back emf is set up in the stator by
 a. stator current b. rotor flux *
 c. applied voltage d. none of the above
134. The back emf produced in the stator of a synchronous motor is depends upon
 a. motor speed only b. rotor excitation only *
 c. either a) or b) d. both a) and b)
135. In a synchronous motor the armature current is obtained by dividing the vector difference of voltages by
 a. armature resistance b. armature inductance
 c. armature capacitance d. armature impedence *
136. In a normal excited synchronous motor the back emf is
 a. equal to applied voltage *
 b. less than the applied voltage
 c. more than the applied voltage
 d. none of the above
137. In a under excited synchronous motor the back emf is
 a. equal to applied voltage
 b. less than the applied voltage *
 c. more than the applied voltage
 d. none of the above
138. In a over excited synchronous motor the back emf is
 a. equal to applied voltage
 b. less than the applied voltage
 c. more than the applied voltage *
 d. none of the above
139. When load is increased in a normal excited synchronous motor then
 a. load angle increases
 b. armature current increases
 c. speed decreases
 d. both a) and b) *
140. In a under excited synchronous motor, when load is increases, the change in power factor is
 a. less than the change in armature current
 b. more than the change in armature current *
 c. equal to the change in armature current
 d. either a) or b)

141. In a over excited synchronous motor, when load is increases, the change in power factor is
 a. less than the change in armature current
 b. more than the change in armature current *
 c. equal to the change in armature current
 d. either a) or b)
142. In a normal excited synchronous motor, when load is increases, the change in power factor is
 a. less than the change in armature current *
 b. more than the change in armature current
 c. equal to the change in armature current
 d. either a) or b)
143. The variations in the excitation of a synchronous motor running with a given load produce variations in
 a. its speed b. its armature current
 c. its load angle d. both b) & c) *
144. The torque developed by a synchronous motor when full voltage is applied to its stator is known as
 a. pull in torque b. pull out torque
 c. running torque d. starting torque *
145. The starting torque of a synchronous motor used in a centrifugal pump is about
 a. 10 % of full load torque *
 b. 50 % of full load torque
 c. 100 % of full load torque
 d. 200 % of full load torque
146. The starting torque of a synchronous motor, used in a loaded reciprocating two cylinder compressor is about
 a. 10 to 20 % of full load torque
 b. 50 to 60 % of full load torque
 c. 100 to 150 % of full load torque
 d. 200 - 250 % of full load torque *
147. The running torque of a synchronous motor is determined by the
 a. horse power and applied voltage
 b. horse power and excitation voltage
 c. horse power and armature current
 d. horse power and speed of the motor *
148. A synchronous motor is started as induction motor till it runs
 a. 2 to 5 % below the synchronous speed *
 b. 2 to 5 % above the synchronous speed
 c. at the synchronous speed
 d. none of the above
149. The amount of torque at which the rotor of a synchronous motor pull into step with synchronously rotating stator field is known as
 a. starting torque b. running torque
 c. pull in torque * d. pull out torque
150. The maximum torque, which a synchronous motor can develop without pulling out of step or synchronism is called
 a. starting torque b. running torque
 c. pull in torque d. pull out torque *
151. The armature current of a synchronous motor has large values for
 a. low values of excitation
 b. high values of excitation
 c. both a) and b) *
 d. none of the above
152. The minimum armature current of a synchronous motor corresponds to
 a. unity power factor * b. lagging power factor
 c. leading power factor d. all the above
153. By synchronous capacitor we mean
 a. normal excited synchronous motor
 b. over excited synchronous motor *
 c. under excited synchronous motor
 d. all the above
154. The hunting in a synchronous motor is caused by
 a. a varying load
 b. a pulsating supply frequency
 c. both a) and b) *
 d. none of the above
155. In a synchronous motor the dampers or damping grids can be used for
 a. preventing the hunting of rotor
 b. making the motor self starting
 c. both a) and b) *
 d. none of the above
156. While starting a synchronous motor provided with damper windings reduced voltage is applied across
 a. stator terminals * b. rotor terminals
 c. both a) and b) d. none of the above
157. During starting of a synchronous motor provided with damper winding, the voltage applied across stator terminals is reduced with the help of :
 a. inverter b. voltage regulator
 c. auto transformer * d. none of the above
158. During starting of a synchronous motor provided with damper winding, dc excitation is applied when it reaches a steady speed by
 a. removing the short circuit on the main field winding*
 b. short circuiting the main field winding
 c. either a) or b)
 d. none of the above

159. A synchronous motor may be operated at any desired power factor by changing the
- supply voltage
 - dc excitation *
 - speed
 - armature current
160. The efficiencies of synchronous motors are excellent for a speed
- below 300 rpm *
 - above 300 rpm
 - below 1000 rpm
 - above 1000 rpm
161. The efficiencies of induction motors are excellent for a speed
- below 300 rpm
 - above 300 rpm
 - below 600 rpm
 - above 600 rpm *
162. Synchronous motors find extensive application on
- power factor correction
 - constant speed, constant load drive
 - voltage regulation
 - all the above *
163. In a transmission line, the sudden rise in voltage due to decrease of inductive load can be controlled by using a
- induction motor
 - repulsion motor
 - synchronous motor *
 - all the above
164. Alternator operates on the principle of
- electro-magnetic induction.*
 - self induction.
 - mutual induction.
 - self or mutual induction.
165. A synchronous machine can operate
- only as a generator
 - only as a motor.
 - both as a generator and as a motor.*
 - none of the above.
166. In a synchronous machine, if the field flux axis is ahead of the armature field axis in the direction of rotation, the machine operating is
- synchronous motor.
 - synchronous generator.*
 - asynchronous motor.
 - asynchronous generator.
167. An alternator generates
- dc.
 - ac.*
 - pulsating dc.
 - dc as well as ac.
168. The armature of an alternator
- is a stationary member.
 - is a revolving member.
 - is the frame.
 - consist of the winding into which current is induced.*
169. In small ac generators
- armature is revolving member.
 - the magnetic field is produced by dc electro-magnetic placed on the stationary member (stator).
 - the current induced in the rotating armature is collected by means of brushes and slip-rings on the revolving member (rotor).
 - all of the above.*
170. In modern alternators, the rotating part is
- field system.*
 - armature.
 - armature as well as field system.
 - none of the above.
171. The current from the stator of an alternator is taken out to the external load circuit through
- slip rings.
 - commutator segments.
 - solid connections.*
 - carbon brushes.
172. Practically all large generators are made with revolving field as
- it is easier to insulate stationary armature winding for high ac voltage (as high as 33,000 V).
 - rotating field is comparatively light and can run with high speed.
 - the load circuit can be connected directly with the fixed terminals of the stator without passing through slip-rings and brushes.
 - the excitation current (dc) can be supplied to the rotor at low voltage of 125 or 250 V through two slip-rings without any difficulty.
 - this arrangement provides more efficient cooling.
 - all of the above.*
173. In a synchronous machine, the stator frame serves the purpose of
- holding the armature stamping in position and also in some cases for circulating cold water for cooling.*
 - insulating the armature windings.
 - providing path to the magnetic flux.
 - protecting the whole machine.
174. In a synchronous machine, the stator frame is made of
- stainless steel.
 - CRGOS.
 - cast iron or welded steel plates.*
 - laminated silicon steel.
175. The stator core of a synchronous machine is built up of _____ laminations.
- stainless steel.
 - silicon steel.*
 - cast iron.
 - cast steel.
176. The stator core of a synchronous machine is laminated so as to reduce.
- eddy current loss.*
 - hysteresis loss.
 - both eddy current and hysteresis loss.

- d. the size and weight of the machine.
177. The stator core stamping also have openings which make _____ ventilating ducts to provide efficient cooling.
 a. axial b. radial
 c. axial as well as radial* d. none of the above
178. The stator slot insulations in synchronous machines are made of
 a. mica cloth. b. fibre glass.
 c. polyester sheets. d. any of these.*
179. Slots provided on the stator core of a synchronous machine are of _____ type.
 a. open.
 b. semi-closed.
 c. totally closed.
 d. either open or semi-closed.*
180. The open slots are more commonly used in the stator of a synchronous machine as
 a. the inductance of winding is less.
 b. they permit the placement of form-wound and insulated coils giving least expensive and more satisfactory.
 c. both (a) and (b).*
 d. none of these.
181. The stator of an alternator gets overheated due to
 a. open phase.
 b. unbalanced currents in the phases.
 c. improper alignment of the rotor.
 d. any one or more of the above.*
182. The machine that supplies dc to the rotor is called the
 a. rectifier. b. exciter.*
 c. convertor. d. inverter.
183. The field system of an alternator is usually excited at
 a. 125/250 V dc.* b. 110/220 V ac.
 c. 3-phase, 50 Hz 400 V. d. 230 V dc.
184. The slip-rings employed in a 3-phase synchronous machine are insulated for
 a. output rated voltage. b. low voltage.*
 c. very low voltage. d. very high voltage.
185. The power rating of the exciter is ordinarily _____ percent of that of synchronous generator.
 a. 0.3 to 1* b. 2 to 5
 c. 5 to 10 d. 10 to 20
186. The exciter of an alternator is a
 a. small dc shunt for compound generator mounted on the shaft of the alternator itself.
 b. a small dc shunt or compound generator driven by a separate electric motor.
 c. a small ac generator.
 d. either (a) or (b).*
187. In a large synchronous generator, dampers are provided in order to
 a. increase stability.
 b. eliminate harmonic effects.
 c. reduce voltage fluctuations.
 d. reduce frequency fluctuations.
 e. both (a) and (b).*
188. In a large synchronous generator, the damper winding is provided for
 a. absorption of energy of oscillations when operating in parallel with another alternator.
 b. suppression of spontaneous hunting when supplying power to a transmission line with high resistance/reactance ratio.
 c. providing a low resistance path for the currents due to unbalancing of voltages.
 d. all of the above.*
189. Squirrel-cage bars placed in the rotor pole faces of an alternator help reducing hunting
 a. above synchronous speed only.
 b. below synchronous speed only.
 c. above and below synchronous speed both.*
 d. none of the above.
190. Synchronous generators (or alternators) are usually driven by
 a. steam turbines. b. water turbines.
 c. steam engines. d. diesel engines.
 e. either steam turbines or water turbines.*
191. An alternator driven by a steam turbine is known as a
 a. turbo-generator.* b. hydro-generator.
 c. steam generator. d. none of the above.
192. Which of the following prime-movers has normally high rotating speed ?
 a. Hydraulic turbine. b. steam turbine.*
 c. Diesel engine. d. Steam engine.
193. Hydro-generator are generally employed to run at _____ rpm.
 a. 500* b. 1,000
 c. 1,500 d. 3,000
194. The high speed turbo-alternator has rotor of diameter and _____ axial length in comparison to those of rotor for a low speed hydro-generator.
 a. smaller, smaller b. larger, larger
 c. smaller, larger* d. larger, smaller
195. In case of turbo-alternators, rotor is made of
 a. forged steel.* b. cast iron.
 c. stainless steel. d. manganese steel.
 e. laminated silicon steel.
196. The poles and pole shoes of a synchronous machine are laminated in order to reduce
 a. reluctance of magnetic circuit.
 b. copper loss.
 c. hysteresis loss.

- d. heating due to eddy currents.*
197. The rotor of an alternator may be of
 a. salient pole type.
 b. non-salient or cylindrical type.
 c. squirrel cage type.
 d. salient pole or smooth cylindrical type.*
198. The salient pole rotors have
 a. two or four projecting poles carrying the field coils.
 b. a large number of projecting poles carrying the field coils.
 c. thick steel laminations riveted together and fixed to the rotor by a dove-tail joint.
 d. pole faces usually provided with slots for damper windings.
 e. all of the above except (a).*
199. The salient pole type rotors have
 a. smaller diameter. b. larger diameter.
 c. smaller axial length. d. larger axial length.
 e. both (b) and (c).*
200. In salient pole field structure, the pole shoes cover about _____ of pole pitch.
 a. one-third b. one half
 c. two-third* d. whole
201. Salient pole field structure has the advantage(s) of
 a. ability to low and moderate speed operations.*
 b. reduced noise.
 c. reduced friction and windage losses.
 d. reduced bearing loads.
202. Larger diameter salient pole rotors have shorter axial length because
 a. it occupies must less space.
 b. it saves lot of copper in stator winding.
 c. it reduces weight of the rotor.
 d. number of conductors held in large circumference of rotor is very large and so they need not be long.*
203. To obtain sinusoidal flux distribution, chamfering of poles is done in
 a. salient-pole alternators only.*
 b. smooth cylindrical pole alternators only.
 c. both of the above.
 d. none of these.
204. The rotor preferred for a low speed hydro-generator is
 a. smooth cylindrical rotor.
 b. salient pole rotor.*
 c. squirrel cage rotor.
 d. none of these.
205. The salient pole rotors are not suitable for high speed turbo-generators due to
 a. excessive bearing friction.
 b. undesirable mechanical oscillations.
 c. high centrifugal force and windage loss.*
 d. large eddy current losses.
206. Smooth cylindrical rotors are usually designed for
 a. 2 or 4 poles.* b. 8 poles.
 c. 12 poles. d. 24 poles.
207. The most suitable rotor for a turbo-alternator designed to operate at high speed is
 a. salient pole type rotor.
 b. smooth cylindrical type rotor.*
 c. squirrel cage rotor.
 d. either of the above.
208. Smooth cylindrical type field structure has the special features of
 a. low windage loss.
 b. better dynamic balancing and quieter in operation.
 c. small diameter and very long axial length.
 d. operate at high speeds (1,000 to 3,000 rpm).
 e. all of the above.*
209. In turbo-alternators, smooth cylindrical rotors have very long axial length because it
 a. reduces friction and windage loss.
 b. reduces centrifugal force.
 c. number of conductors being less, they have to be necessarily long for generating the required voltage.*
 d. none of the above.
210. Cylindrical rotor alternator use _____ ducts for efficient cooling.
 a. only radial. b. only axial.
 c. both radial and axial.* d. none of the above.
211. In cylindrical rotor _____ portion of rotor is wound.
 a. one-third. b. two-third.*
 c. one-half. d. whole.
212. Rotor shaft of a 500 MW synchronous generators is supported in _____ bearings.
 a. journal.* b. needle.
 c. ball. d. roller.
213. The frequency of emf generated per revolution in an alternator is equal to
 a. number of poles.
 b. number of pair of poles.*
 c. twice the number of poles.
 d. number of armature conductors per pole.
214. The frequency of emf generated by an alternator depends upon the alternator speed (N in rpm) and number of poles on the alternator field P and is given as
 a. $PN/60$ b. $60N/P$
 c. $PN/120$ * d. $120N/P$
215. The maximum possible speed at which an alternator can be driven to generate 50 Hz and 4,000 V is
 a. 4,000 rpm. b. 3,600 rpm.
 c. 3,000 rpm.* d. 1,500 rpm.

216. Two mechanically coupled alternators deliver power at 50 Hz and 60 Hz respectively. The highest speed of the alternators is
- 3,600 rpm.
 - 3,000 rpm.
 - 600 rpm.*
 - 500 rpm.
217. The most appropriate operating speeds in rpm of generators used in Thermal, Nuclear and Hydro-power plants would respectively be
- 3000, 300 and 1500.
 - 3000, 3000 and 300.*
 - 1500, 1500 and 3000.
 - 1000, 900 and 750.
218. The air-craft alternators are designed to generate emf of high frequency of 400 Hz in order to
- reduce the bulk.*
 - compensate for high speeds.
 - make the systems free from external disturbances.
 - all of the above.
219. Armature winding is one in which
- emf is induced by the leakage flux.
 - emf is induced by the main or working flux.*
 - working or main flux is created by the field current.
 - working or main flux is created by the armature current.
220. Armature winding in ac machines
- is always closed one.
 - is always open one.
 - may be either closed one giving delta connections or open one giving star connections.*
221. A pole-pitch in electrical machines is equal to
- 180 electrical degrees.*
 - 90 electrical degrees.
 - 120 electrical degrees.
 - 360 electrical degrees.
222. A coil consist of
- two conductors.
 - two coil-sides.*
 - two turns.
 - one turn.
223. The stator of modern alternators are wound for _____ phase groups.
- 180°
 - 120°
 - 60°*
 - 240°
224. In concentrated winding, the number of slots is equal to the number of
- coil sides.
 - poles.*
 - conductors.
 - coils.
225. Concentrated winding has
- one coil per phase.
 - two coils per phase.
 - one coil per pair of poles per phase.*
 - one coil per pole per phase.
226. In a concentrated winding, the induced emf will be maximum when the two sides of a coil are _____ pole pitch apart.
- one-half.
 - one.*
 - one and half.
 - two.
227. For a two layer winding the number of stator slots is equal to the number of
- poles.
 - conductors.
 - coil sides.
 - coils.*
 - pole pairs.
228. For a concentrated winding the polar group of each phase is _____ electrical degrees apart.
- 360°*
 - 180
 - 120
 - 60
229. The winding for an alternator are
- 36 slots, 4-poles, span 1 to 3
 - 72 slots, 6-poles, span 1 to 10
 - 96 slots, 6-poles, span 1 to 12
- The winding having pitch factor of more than 0.9 are
- I and II only.*
 - II and III only.
 - I and III only.
 - I, II and III.
230. Distributed winding has the advantage(s) of
- better utilization of core as a number of small slots evenly spaced are used.
 - improved wave-form as harmonic emfs are reduced.
 - diminished armature reactance and armature reaction.
 - efficient cooling.
 - all of the above.*
231. Distributed winding is preferred over concentrated winding as it
- reduces noise.
 - reduces the machine size.
 - reduces the amount of copper required.
 - improves the generated emf wave-form and adds rigidity and mechanical strength to the winding.*
232. In a synchronous alternator, which of the following coils will have emf closer to sine wave forms ?
- Concentrated winding in full pitch coils.
 - Concentrated winding in short pitch coils.
 - Distributed winding in full pitch coils.
 - Distributed winding in short pitch coils.*
233. If the space flux distribution is non-sinusoidal, emf induced in the distributed winding will be
- more sinusoidal in comparison to the flux distribution.*
 - less sinusoidal in comparison to the flux distribution.
 - of the same shape as that of flux distribution.
 - none of the above.
234. The armature winding of a 2-pole 3-phase alternator for each phase is distributed in a number of slots per phase. The rms value of the voltage per phase is less than the rms value of the voltage per coil series because the

- a. equal to b. lower than
c. higher than* d. none of these
251. A 3-phase 4-pole alternator has 48 stator slots carrying the 3-phase distributed winding. Each coil of the winding is short chored by one slot pitch. The winding factor is given by
- a. $\frac{1}{16} \cot(7.5^\circ)$ b. $\frac{1}{8} \cot(7.5^\circ) *$
c. $\frac{1}{16 \sin(7.5^\circ)}$ d. $\cos(7.5^\circ)$
252. The ratio of phasor sum of induced emfs per coil to the arithmetic sum of induced emfs per coil is known as
- a. distribution factor.
b. winding factor.
c. coil span or pitch factor.*
d. breadth factor.
253. The ratio of the phasor sum of the emfs induced in all the coils distributed in a number of slots under one pole to the arithmetic sum of the emfs induced is known as
- a. breadth or distribution factor.*
b. coil span factor.
c. pitch factor.
d. winding factor.
254. Three phase alternators are invariably connected in star so as to
- a. reduce the size of stator conductors used.
b. increase the terminal voltage.*
c. reduce magnetic losses.
d. all of the above.
255. The stator winding of an alternator is normally connected in star to eliminate the _____ harmonic component of the voltage waveform
- a. third* b. fifth
c. seventh
256. The emf generated in an alternator depends upon
- a. frequency.
b. flux per pole.
c. number of turns in the coils.
d. type of winding and coils used.
e. all of the above.*
257. The emfs generated in three phase of an alternator are _____ electrical degrees apart.
- a. 60 b. 90
c. 120* d. 180
258. In ac rotating machines, the generated emf
- a. is in phase with the working flux f.
b. lags behind f by 90° *
c. leads f by 90°
d. lags f by 180°
259. The armature of a single phase alternator is completely wound with T single turn coil distributed uniformly. The induced voltage in each turn is 2 V (rms). The emf of the whole winding is
- a. 2 T volt. b. 1.11 T volt.
c. 1.414 T volts. d. 1.273 T volts.*
260. The angle between induced emf and terminal voltage on no-load for a single phase alternator is
- a. 180° b. 90°
c. $0^\circ *$ d. none of these.
261. The space harmonics absent in the mmf of a 3-phase synchronous machine produced by balanced sinusoidal currents in the armature are
- a. 3, 9, 15, 21 etc.* b. 5, 11, 17, 23, etc.
c. 7, 13, 19, 25 etc. d. all of these.
262. The 5th space harmonics in the mmf developed by balanced fundamental frequency armature currents rotate at _____ times the synchronous speed with respect to the field.
- a. $5/6$ b. $6/5*$
c. $5/4$ d. $5/7$
263. The seventh space harmonics in the mmf produced by balanced fundamental frequency armature currents rotate at _____ times the synchronous speed with respect to the field.
- a. $5/7$ b. $8/7$
c. $6/7*$ d. $7/6$
264. Unlike dc generator kw rating, ac generators are rated in
- a. KVA or MVA* b. KVAR
c. MW d. Mega-amperes
265. The output of an alternator depends on
- a. generated emf. b. power factor.*
c. terminal voltage. d. all of these.
266. The rating of the prime-mover driving an alternator is determined entirely by its _____ rating.
- a. voltage b. current
c. KW output* d. speed
267. For the same power rating, an alternator operating at lower voltage will be
- a. larger in size.* b. smaller in size.
c. less noisy. d. more efficient.
268. The maximum current that can be supplied by an alternator depends on
- a. exciter current.
b. exciter speed.
c. strength of magnetic field.*
d. number of poles.
269. When an alternator designed for operation at 60 Hz is operated at 50 Hz
- a. kva rating will increase in the ratio of 1: 2.

- b. operating voltage will reduce in the ratio of 5/6.*
 c. operating voltage will increase in the ratio of 1 : 2.
 d. operating voltage will reduce in the ratio of $\left(\frac{5}{6}\right)^2$.
270. The rating of a synchronous machine is usually governed by its
 a. speed. b. temperature rise.*
 c. weight. d. none of these.
271. The flux set up by the armature current, which does not cross the air-gap and takes a different path is called the _____ flux.
 a. leakage* b. main
 c. cross magnetizing d. demagnetizing.
272. The emf set up by the leakage flux due to self induction is called the _____ emf.
 a. leakage b. reactance*
 c. self-induced d. none of these
273. The magnitude of leakage flux depends on
 a. the magnitude of armature current.
 c. phase angle between armature current and terminal voltage.
 c. air gap thickness.
 d. both (a) and (b).*
274. The impedance value of a generator is 0.2 pu on a base value of 11 kv, 50 MVA. The impedance value for a base value of 22 kv, 150 MVA is
 a. 0.15 pu.* b. 0.2 pu.
 c. 0.3 pu. d. 0.24 pu.
275. In an alternator, reactance emf
 a. leads the current by 90° .*
 b. lags behind the current by 90° .
 c. is in phase with the current.
 d. none of the above.
276. Leakage reactance of the armature of a salient pole synchronous machine which varies with the position of rotor is due to leakage flux
 a. of end connections.
 b. which comes out of slot teeth, crosses the air-gap and enters the pole faces.*
 c. which remains within the slot.
 d. none of the above.
277. In a synchronous generator
 a. the armature mmf leads the air-gap flux and air-gap flux leads the field mmf.
 b. the armature mmf lead the air gap flux and the air-gap flux lags behind the field mmf.
 c. the armature mmf lags behind the air gap flux and air-gap flux lags behind the field mmf.*
 d. the armature mmf lags behind the air-gap and air-gap flux leads the field mmf.
278. The armature reaction is the effect of armature flux
 a. on the main field flux.*
 b. on the speed of the alternator.
 c. both (a) and (b).
 d. none of these.
279. The armature reaction effect influences the
 a. operating speed.
 b. windage losses.
 c. generated voltage per phase.*
 d. none of the above.
280. Armature reaction effect is/are _____ on the main field flux.
 a. distorting (or cross-magnetizing) as well as demagnetizing.*
 b. only assisting.
 c. only demagnetizing.
 d. only distorting.
281. The armature reaction effect in a synchronous machine depends on
 a. load current.
 b. power factor of the load.
 c. speed of the machine.
 d. both (a) and (b).*
282. In a synchronous generator, the effect of cross-magnetization is to make the generated voltage
 a. truly sinusoidal. b. non-sinusoidal.*
 c. free from harmonics. d. none of these.
283. In an alternator, the armature mmf will be in phase with the main field flux only when the load is purely
 a. resistive. b. inductive.
 c. capacitive.*
284. In an alternator, the armature reaction is considered to be equivalent to a fictitious
 a. reactance.* b. resistance.
 c. impedance. d. admittance.
285. Drop in terminal voltage of an alternator due to armature reaction is countered by
 a. damper winding.
 b. effect of saliency.
 c. increased prime-mover output.
 d. automatic voltage regulator.*
286. Synchronous reactance of alternator represents
 a. armature reactance and leakage reactance.*
 b. a reactance operating at synchronous speed.
 c. field winding reactance.
 d. a reactance connected in series with a synchronous generator.
287. The synchronous reactance of an alternator is due to
 a. leakage flux only.
 b. reactance because of armature reaction in the machine.*
 c. synchronous machine reactance.

- d. both, leakage flux as well as armature reaction.
288. The saturated synchronous reactance of an alternator is _____ its unsaturated synchronous reactance.
- more than.
 - less than*
 - equal to
 - none of these
289. A 3-f alternator has negligible stator resistance. A short-circuit test is conducted on this alternator. At a particular speed a field current of I_{f1} is required to drive the rated armature current. If the speed of the alternator is reduced to half, the field current required to maintain rated armature current
- would be equal to I_{f1}
 - would be equal to $2 I_{f1}$
 - would be equal to $\frac{I_{f1}}{2}$
 - cannot be predicted due to insufficient data.*
290. In an alternator, short-circuit current is limited by the
- saturated synchronous impedance.
 - unsaturated synchronous impedance.*
 - either of the above.
 - none of these.
291. Synchronous impedance of a synchronous machine is given as phasor sum of
- armature resistance and armature reactance.
 - armature resistance and leakage reactance.
 - armature resistance and synchronous reactance.*
 - armature reactance and leakage reactance.
292. The terminal voltage of an alternator changes with the increase in load due to voltage drop on account of
- armature effective resistance.
 - armature leakage reactance.
 - armature reaction.
 - all of the above.*
293. When the load (inductive) is thrown off, the terminal voltage will
- increase*
 - decrease
 - remain unchanged.
 - none of these.
294. The magnitude of change in terminal voltage of a synchronous generator depends on the
- load current.
 - power factor of the load.
 - speed of the machine.
 - rating of the machine.
 - both (a) and (b).*
295. As the leading power factor of the load of an alternator decreases, the magnitude of generated voltage required to give rated terminal voltage
- increases.
 - decreases.*
 - remain unchanged.
296. In a synchronous generator delivering lagging power factor load
- the excitation emf leads terminal voltage by the power angle.*
 - the excitation emf lags the terminal voltage by the power angle.
 - excitation emf leads the terminal voltage by the power factor angle.
 - none of the above.
297. When the alternator is operating on no load the power supplied by the prime-mover is mainly consumed in meeting
- copper loss.
 - core loss.
 - bearing friction loss.
 - windage loss.
 - all of the above losses.*
298. The power factor on which an alternator operates depends on the
- speed of the prime-mover.
 - nature of the load being supplied.*
 - armature losses.
 - copper losses.
299. Unbalanced 3-phase stator currents cause
- vibrations.
 - heating of rotor.
 - double frequency currents in the rotor.
 - all of the above.*
300. Overheating of windings of generator
- reduces the generated voltage.
 - reduces the power factor.
 - reduces the life of the machine.*
 - does not have any significant effect.
301. The regulation of an alternator is defined as the
- increase in terminal voltage when full load is thrown off, assuming field current and speed remaining the same.*
 - fall in terminal voltage when the full load is thrown off, assuming field current and speed remaining unchanged.
 - the change in terminal voltage under the conditions of the maximum and minimum excitations.
 - none of above.
302. The regulation of an alternator is given as
- $\frac{V - E_0}{V} \times 100$
 - $\frac{E_0 - V}{V} \times 100$ *
 - $\frac{V}{E_0} \times 100$
 - $\frac{E_0 - V}{E_0} \times 100$
303. Regulation of an alternator supplying resistive or inductive load is
- always +ve*
 - always -ve
 - either of the above or zero.
 - none of the above.
304. The regulation of an alternator is likely to be negative

- in case of _____ load.
- resistive
 - inductive
 - capacitive*
 - any type of
305. A leading pf load on an alternator implies that its voltage regulation shall be
- positive
 - negative
 - zero
 - any one of these*
306. The effect of leading power factor on the voltage regulation of an alternator is
- increasing in nature.
 - decreasing in nature.*
 - maintained at constant value.
 - oscillating in nature.
307. The synchronous impedance method of determination of regulation of an alternator is also said to be the pessimistic method as it gives the value of synchronous impedance always
- more than its actual value under normal condition.*
 - less than its actual value under normal condition.
 - equal to synchronous reactance.
308. The regulation obtained by synchronous impedance method is always higher than actual value because
- synchronous reactance is assumed variable while it is not.
 - effective armature resistance is assumed constant.
 - synchronous reactance is assumed constant while it is not.*
 - field current is increased to give short-circuit current about twice of full-load current.
309. Synchronous impedance or emf method gives more regulation in comparison to mmf method because in this method
- armature reaction is considered negligible
 - saturation effect is ignored.*
 - saturation effect is taken into account.
310. The short-circuit characteristic of an alternator is
- always linear.*
 - always non-linear.
 - either of (a) or (b).
 - none of these.
311. Under short-circuit conditions, the power factor of an alternator is
- unity.
 - almost zero lagging.*
 - almost zero leading.
 - none of the above.
312. Modern alternators are designed to have poor regulation as it
- increases the value of short-circuit current.
 - limits the value of short-circuit current.*
 - increases the efficiency of operation.
 - both (a) and (c).
313. The phasor diagram by ASA method gives
- reliable result for both regulation and power angle of a salient pole synchronous generator.
 - reliable result for power angle but erroneous result for regulation.
 - reliable result for regulation but erroneous result for power angle.*
 - erroneous results for both regulation and power angle of a salient-pole synchronous generator.
314. The experimental data required for Potier method of determination of voltage regulation of an alternator are
- no-load curve and zero pf curve.*
 - no-load curve, short-circuit data.
 - short-circuit data and zero pf curve.
 - none of the above.
315. Which of the following methods is best for determining the voltage regulation of alternators ?
- EMF method.
 - MMF method.
 - Potier or zero pf method.*
 - none of the above.
316. Armature reaction mmf and leakage reactance of a synchronous machine are determined by
- open-circuit and short-circuit tests.
 - open-circuit and zero pf test.*
 - open-circuit test only.
 - zero pf test only.
317. The four methods of calculation of voltage regulation of 3-phase alternator are
- EMF method.
 - Saturated synchronous reactance method.
 - New ASA method.
 - MMF method.
- The correct sequence of the ascending order of the value of regulation obtained by these method is
- 3, 4, 2, 1
 - 4, 3, 1, 2
 - 3, 4, 1, 2
 - 4, 3, 2, 1*
318. By slip test on a 3-phase synchronous generator the maximum and minimum impressed voltages per phase are found to be V_{\max} and V_{\min} respectively. The values of the direct axis synchronous reactance X_d and quadrature axis synchronous reactance X_q are given as
- $X_d = \frac{V_{\max}}{I_{\min}}; X_q = \frac{V_{\min}}{I_{\max}} *$
 - $X_d = \frac{V_{\max}}{I_{\min}}; X_q = \frac{V_{\min}}{I_{\min}}$
 - $X_d = \frac{V_{\max}}{I_{\min}}; X_q = \frac{V_{\max}}{I_{\max}}$
 - $X_d = \frac{V_{\min}}{I_{\max}}; X_q = \frac{V_{\max}}{I_{\min}}$
319. Which of the following statements associated with synchronous machines is WRONG ?

- a. Load characteristic of a synchronous generator gives relation between terminal voltage and field current at constant load current pf.
- b. The regulation curve of a synchronous generator gives relation between field current and load current at constant pf of pf at constant load current.
- c. The short-circuit ratio is equal to synchronous impedance of the machine in pu.*
- d. Potier reactance is slightly higher than leakage reactance because of excessive saturation of the field poles during zero pf test.
320. An alternator with higher value of SCR has
- Poor voltage regulation and lower stability limit.
 - better voltage regulation and higher stability limit.*
 - poor voltage regulation and higher stability limit.
 - better voltage regulation and low stability limit.
321. When a synchronous generator is designed with lower value of SCR it
- will give higher stability limit.
 - will give lower SC current.*
 - will give better voltage regulation.
 - will have higher synchronous power.
322. A round rotor synchronous generator has a leakage reactance of 10%, armature reaction reactance of 90% and negligible armature resistance. With the machine initially running at rated speed and terminal voltage of 1.0 pu, a 3-phase short-circuit is applied. The sustained armature current will be
- 1.25 pu.
 - 1.11 pu.
 - 1.0 pu.*
 - 0.9 pu.
323. The cooling medium used in large sized synchronous machines is usually
- hydrogen.*
 - air.
 - water.
 - mineral oil.
 - sulphur hexafluoride.
324. The magnitude of resultant flux of a 2-phase winding is _____ the value of maximum flux due to either phase.
- half of
 - equal to*
 - one and half of
 - twice
325. The magnitude of resultant flux of a 3-phase winding is _____ the value of maximum flux due to either phase.
- half of
 - equal to
 - one and half of *
 - three times of
326. Single phase winding needs _____ minimum number of coils.
- one *
 - two
 - four
 - six
327. The mmf produced by single phase winding is
- pulsating and rotating with constant speed.
 - pulsating and stationary.*
 - constant in amplitude and stationary.
 - constant in amplitude and rotating.
328. The minimum number of windings required for producing a poly phase field is
- one
 - two*
 - three
 - none of these
329. A poly phase field is
- pulsating and stationary
 - pulsating and rotating.
 - constant in amplitude and rotating at synchronous speed.*
 - constant in amplitude and stationary in space.
330. When a balanced 3-phase distributed type armature winding is carrying 3-phase, balanced currents, the strength of the resultant rotating magnetic field is
- three times the amplitude of each constituent pulsating magnetic field.
 - equal to the amplitude of each constituent pulsating magnetic field.
 - half the amplitude of each constituent pulsating magnetic field.
 - one and half times the amplitude of each constituent of pulsating magnetic field.*
331. A synchronous generator has its field winding on the rotor and armature winding on the stator. When running under steady state conditions its air gap field is
- stationary with respect to stator.
 - rotating at synchronous speed with respect to rotor.
 - rotating at synchronous speed against the direction of rotor rotation.
 - rotating at synchronous speed in the direction of rotor rotation.*
332. In construction, synchronous motor is similar to a/an
- dc motor
 - slip-ring induction motor.
 - alternator*
 - rotary converter.
333. The essential parts of synchronous motor are
- laminated stator core with 3-phase armature winding
 - rotating field structure complete with damper winding and slip-rings.
 - brushes and brush holders.
 - two end shields to house the bearings that support of rotor shaft.
 - all of the above.*
 - (a), (b) and (d).
334. Synchronous motor generally have
- salient pole rotor.*
 - smooth cylindrical rotor.
 - either salient pole or smooth cylindrical rotor.
 - none of the above.

335. Rotor winding of a synchronous motor is excited by
 a. dc supply at $100\frac{3}{4}250$ V.*
 b. ac supply at 400 V.
 c. revolving field.
 d. induction from stator currents.
336. 3-phase synchronous motors need
 a. dc supply only.
 b. 3-f ac supply only.
 c. 3-phase ac supply as well as dc supply.*
 d. 3-phase ac supply and single phase ac supply.
337. Number of slip-rings in a 3-phase synchronous motor will be
 a. 0
 b. 1
 c. 2*
 d. 3 or 4
338. The doubly excited magnetic systems are
 a. solenoids.
 b. synchronous motors*
 c. electro-magnetic relays.
 d. none of these.
339. Electro-magnetic force or torque developed in any physical system tends to
 a. increase both the field energy and co-energy at constant current.
 b. reduce both the field energy and co-energy at constant current.
 c. reduce reluctance.
 d. reduce inductance.
 e. reduce permanence.
 f. both (a) and (c).*
340. In a synchronous motor
 a. the rotor mmf and stator mmf are stationary with respect to each other.*
 b. rotor mmf rotates slightly faster in comparison to stator mmf.
 c. stator mmf rotates slightly faster than rotor mmf.
 d. none of the above.
341. A synchronous machine is revolving armature and stationary field type. Under steady running conditions, the air gap field
 a. rotates at synchronous speed with respect to stator.
 b. rotates at synchronous speed in the direction of rotation of rotor.
 c. remains stationary with respect to stator.*
 d. remains stationary with respect to rotor.
342. In which of the following motors, the stator and rotor magnetic fields rotate at the same speed ?
 a. Inductance motors.
 b. Synchronous motors.*
 c. Universal motors.
 d. Reluctance motors.
343. In a synchronous machine, if the armature field axis is ahead of the field flux axis in the direction of rotation the machine operating is
 a. synchronous motor.
 b. synchronous generator.*
 c. asynchronous motor.
 d. asynchronous generator.
344. In a synchronous machine if the axis of the field flux coincides with that of armature flux, the machine
 a. will operate smoothly without any vibration.
 b. is said to be floating.*
 c. is operating as a synchronous generator.
 d. is operating as a synchronous motor.
345. In a 3-phase synchronous motor the magnitude of field flux
 a. remain constant at all loads.*
 b. varies with load.
 c. varies with speed.
 d. varies with power factor.
346. In a 3-phase synchronous motor
 a. the field mmf leads the air gap flux and air-gap flux leads the armature mmf.
 b. the armature mmf leads the air-gap flux and air-gap flux leads the field mmf.*
 c. the armature mmf leads the air-gap flux and air-gap flux lags behind the field mmf.
 d. none of the above.
347. The relative speed between the magnetic fields of stator and rotor under steady state operation is zero for
 a. a dc machine.
 b. an induction machine.
 c. a synchronous machine.*
 d. all the above machines.
348. A 3-phase synchronous motor needs dc supply for excitation
 a. continuously.*
 b. all the starting instant only.
 c. of stator
 d. none of these.
349. The coupling magnetic field reaction with _____ system(s) is essential for extracting energy from an electrical system.
 a. mechanical
 b. electrical*
 c. both electrical and mechanical
350. A synchronous motor having negligible loss, while operating on no load, will have armature current
 a. very large
 b. large
 c. very small*
 d. depending upon excitation
351. The armature current of a synchronous motor on no load without any loss
 a. leads the applied voltage by 90°
 b. lags behind the applied voltage by 90°
 c. is in phase with applied voltage.
 d. zero.*

352. As the load is increased on a synchronous motor, its speed
- decreases.
 - increases.
 - remain constant and additional load is supplied by shift in relative position of the rotor with respect to stator rotating magnetic field.*
 - remains constant for some time and then falls abruptly.
353. A synchronous motor operating with normal excitation adjusts to increased load due to increase in
- back emf.
 - armature current.*
 - power factor.
 - none of these.
354. The synchronous motor meets increase in load by taking more armature current as
- the rotor pole falls back relative to the stator pole causing an increase in motor current.*
 - the back emf decreases causing an increase in motor current.
 - rotating field is strengthened causing an increase in motor current.*
 - none of the above.
355. A synchronous motor is operating with normal excitation. With the increase in load the armature current drawn from the supply main increases due to
- increase in back emf.
 - fall in motor speed.
 - increase in resultant voltage across the armature.*
 - increase in power factor.
356. In a synchronous motor, under operating conditions, the angle between induced voltage and supply voltage will be
- zero.
 - between 0 and 90°
 - between 90° and 180°* d. more than 180°
357. The magnitude of emf induced in the armature of a synchronous motor (E_b) depends upon
- supply voltage.
 - rotor excitation.*
 - rotor speed.
 - flux density.
 - all of the above.
358. The phase of emf induced in the armature of a synchronous motor (E_b) depends upon
- rotor speed.
 - load.*
 - both load and speed.
 - none of the above.
359. The resultant voltage acting across the armature circuit of a synchronous motor (E_r) is the _____ of induced emf in the armature circuit (E_b) and supply voltage V.
- arithmetic sum.
 - arithmetic difference.
 - phasor difference.*
 - phasor sum.
360. In a synchronous motor, the synchronizing power comes into action when
- rotor speed either exceeds or falls below the synchronous speed.*
 - rotor speed is equal to synchronous speed.
 - rotor speed falls below the synchronous speed.
 - rotor speed exceeds the synchronous speed.
361. Synchronizing power of a synchronous motor varies
- directly as synchronous reactance, X_s .
 - directly as the square of the synchronous reactance, X_s^2 .
 - inversely as the synchronous reactance, $1/X_s$.*
 - none of the above.
362. The coupling angle or load angle of a synchronous motor is defined as the space angle between the
- rotor and stator poles of the same polarity.
 - rotor and stator poles of opposite polarity.*
 - rotor and stator teeth.
 - none of the above.
363. The torque angle δ is defined as the space angle between
- stator field axis and resultant field axis.
 - rotor field axis and resultant field axis.
 - stator field axis and rotor field axis.*
 - stator field axis and mutual field axis.
364. In a synchronous motor torque or load angle _____ with increase in load.
- increases*
 - decreases.
 - remains unaffected.
 - none of these.
365. The value of load angle for a synchronous motor is minimum when the motor is operating on
- full load.
 - maximum load.
 - no load.*
 - none of these.
366. The value of load angle for a synchronous motor depends mainly upon its
- excitation.
 - load.*
 - speed.
 - supply voltage.
367. A 3-phase, 400 V, 50 Hz synchronous motor is operating normally. If the load on the motor is doubled keeping the excitation constant, the new load angle will become nearly
- double*
 - half
 - four times
 - $\sqrt{2}$ times
368. The mechanical displacement of the rotor field axis with respect to stator field axis in a synchronous motor running on full load is of the order of
- 0°
 - 5°*
 - 10°
 - 15°
369. The total steady state torque to drive the synchronous motor and the load at synchronous speed is known as _____ torque.
- reluctance
 - pull-out
 - synchronous*
 - average
370. A synchronous motor develops synchronous torque only

- a. at synchronous speed.*
 b. on no-load.
 c. on full-load
 d. while over-excited.
 e. while under-excited.
371. Electro-magnetic torque is present in rotating machines when
 a. stator winding carries current.
 b. rotor winding carries current.
 c. both stator and rotor windings carry current.*
 d. none of the above.
372. In a synchronous motor electro-magnetic power varies
 a. directly as supplied voltage.*
 b. directly as square of the applied voltage.
 c. inversely as applied voltage.
 d. none of the above.
373. The interaction torque in a synchronous motor depends upon
 a. stator field strength alone.
 b. rotor field strength alone.
 c. torque angle alone.
 d. all of the above i.e. on stator field and rotor strengths and torque angle.*
374. The breakdown torque of a synchronous motor varies as
 a. applied voltage V .* b. V^2
 c. $1/V$ d. \sqrt{V}
375. The maximum constant load torque under which a synchronuous motor will pull into synchronism at rated rotor supply voltage and rated frequency is called the _____ torque.
 a. pull-out b. pull-in*
 c. synchronous d. reluctance
376. Higher the applied voltage
 a. higher will be the stator flux.
 b. higher will be the pull-in torque.
 c. lower will be the stator flux.
 d. lower will be pull-in torque.
 e. both (a) and (b).
 f. both (a) and (d).*
377. The maximum torque which will be developed by a synchronous motor at rest for any angular position of the rotor, at rated stator supply voltage and frequency is called the _____ torque.
 a. reluctance b. synchronous
 c. locked rotor* d. pull-out
378. The operation of a 3-phase synchronous motor operating on constant excitation across infinite bus will not be stable if power angle δ
 a. exceeds internal angle ϕ .*
 b. is less than ϕ .
 c. exceeds $\phi/2$.
 d. is less than $\phi/2$.
379. A 3-phase synchronuous motor will operate on lagging power factor will
 a. open-circuit voltage per phase E_0 exceeds $V \sin \phi$.
 b. $E_0 < V \sin \phi$.*
 c. $E_0 < V$.
 d. $E_0 \sin \phi < V$.
380. A 3-phase synchronous motor connected to an infinite bus-bar, with constant excitation, is driving a certain load and operating at leading power factor. If the shaft load is reduced
 a. the load angle will increase.
 b. the load angle will decrease.
 c. power factor will increase.
 d. both load angle and power factor will decrease.*
381. A synchronous motor is supplying a load at unity pf. If the load on the motor is increased keeping its excitation and terminal voltage constant, the power factor
 a. will remain the same. b. will become leading.
 c. will become lagging.* d. none of the above.
382. A 3-phase synchronous motor connected to an infinite bus is operating at half-full load with normal excitation. When the load on the synchronous motor is suddenly increased
 a. its speed will first decrease and then become synchronous.
 b. its speed will first increase and then become synchronous.
 c. its speed and then become synchronous.*
 d. its speed will remain unchanged.
383. A synchronous generator connected to an infinite bus is over-excited. Considering only the reactive power, from the point of view of the system, the machine acts as
 a. capacitor* b. inductor
 c. resistor d. none of the above
384. A synchronous machine connected to a power system grid bus-bar is operating as a generator. To make the machine operate as a motor, the
 a. direction of rotation is to be reversed.
 b. phase-sequence is to be changed.
 c. field excitation is to be decreased.
 d. mechanical input is to be less than the losses at the shaft.*
385. A salient pole synchronous motor is running on no-load. If its excitation is made off, it will
 a. continue running at synchronous speed.
 b. continue running but at a speed slightly less than synchronous one.*
 c. stop.
 d. none of these.
386. A salient pole synchronous motor continues running

- even if its excitation current is reduced to zero. This is due to
- rotating magnetic field of stator.
 - rotating magnetic field of rotor.
 - magnetization of rotor salient poles by stator magnetic field.*
 - interlocking action between stator and rotor rotating magnetic fields.
387. A smooth cylindrical synchronous motor will always stop when
- excitation winding gets disconnected.*
 - load varies.
 - supply voltage fluctuates.
 - supply frequency varies.
388. An increase in supply voltage to a 3-phase synchronous motor will reduce
- pull-in-torque* b. stator flux.
 - both (a) and (b) d. none of these
389. A synchronous motor is running clockwise. If the direction of field current is reversed, the motor would
- come to stop.
 - run in reversed direction.
 - run as before.*
 - run as before but at less speed.
390. The speed of a synchronous motor depends upon
- supply voltage. b. supply frequency.
 - excitation. d. number of poles.
 - both supply frequency and number of poles.*
391. The speed of a synchronous motor can be varied by varying its
- excitation. b. supply voltage.
 - supply frequency* d. load
392. For a 3-phase, 4-pole, 50 Hz synchronous motor the frequency, pole number and the load torque are all halved. The motor speed will be
- 375 rp., b. 75 rpm.
 - 1,500 rpm.* d. 3,000 rpm.
393. The speed of a synchronous motor
- remains constant from no load to full load.*
 - varies with the variation in load.
 - decreases with the increase in load.
 - increases with the increase in load.
394. A synchronous motor with comparatively large air gap gives
- higher stability limit.
 - high synchronizing power making the machine less sensitive to load variations.
 - both (a) and (b)*
 - none of these.
395. In a 3-phase synchronous motor, the magnitude of back emf set up in the stator depends on
- rotor excitation.* b. supply voltage.
 - rotor speed. d. load on motor.
396. The magnitude of counter or back emf in a synchronous motor
- is always less than supply voltage.
 - is always more than supply voltage.
 - is always equal to supply voltage.
 - may be either equal to or less than or more than supply voltage.*
397. In a synchronous motor the excitation voltage on no load is approximately equal to the applied voltage. This will happen
- when developed torque is maximum.
 - with zero excitation.
 - with 100% excitation.*
 - none of the above.
398. A synchronous motor can operate at
- leading power factor only.
 - lagging power factor only.
 - unity power factor only.
 - zero power factor only.
 - any power factor-zero, leading, lagging or unity.*
399. Which motor can conveniently operate at lagging as well as leading power factor ?
- Squirrel cage induction motor.
 - Wound motor.
 - Synchronous motor.*
 - D C shunt motor.
400. At constant load, the magnitude of armature current drawn by a synchronous motor is large for
- low excitation.
 - high excitation.
 - both low and high values and field excitation.*
 - 100 % excitation.
401. A synchronous motor operating at unity power factor draws _____ armature current.
- zero b. minimum*
 - maximum d. none of these
402. Variation in dc excitation of a synchronous motor causes variation in
- speed of motor.
 - power factor.
 - armature current.
 - both armature current and power factor.*
403. Power factor of a synchronous motor can be varied by varying
- applied voltage. b. supply frequency.
 - excitation.* d. load.
404. A 3-phase synchronous motor is operating at a given load. If an increase in excitation reduces the armature current, it can be concluded that the motor is
- operating at lagging power factor and absorbing reactive power from the mains.*

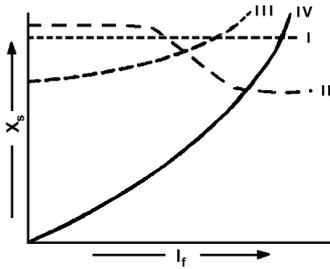
- b. operating at leading power factor and delivering reactive power to the mains
 c. either (a) or (b).
 d. none of these.
405. A synchronous motor installed at the end of a transmission line is operating at lagging power factor. With the fall in supply voltage, the power factor of the synchronous motor will
 a. go down. b. improve.*
 c. remain unchanged. d. none of these.
406. A synchronous motor is connected to a constant voltage, constant supply frequency. The motor is initially operated at lagging power factor. When the field current is increased
 a. the load angle increases.
 b. the power input increases.
 c. the power factor decreases.
 d. the armature current decreases upto a certain limit and then increases.*
407. A synchronous motor operates at 0.8 pf lagging. If the field current of the motor is continuously increased
 a. the power factor decreases upto a certain value of the field current and thereafter it increases.
 b. the armature current increases upto a certain value of the field current and thereafter it decreases.
 c. the power factor increases upto a certain value of field current and thereafter it decreases.
 d. the armature current decreases upto a certain value of field current and thereafter it increases.
 e. both (c) and (d).*
408. Stability of a synchronous motor _____ with the increase in excitation.
 a. increases* b. decreases
 c. remain unaffected.
409. A 3-phase synchronous motor driving a constant torque load is drawing power from an infinite bus-bar at a leading power factor. With the increase in excitation the
 a. pf increase. b. pf decreases.*
 c. power angle increases d. pf remains unaffected.
410. Armature reaction in a synchronous motor at rated voltage and zero power factor (lead) is
 a. magnetizing.
 b. cross-magnetizing.
 c. both magnetizing and cross-magnetising.
 d. demagnetising.*
411. Armature reaction in a synchronous motor at rated voltage and zero power factor lagging is
 a. cross-magnetising. b. demagnetising.
 c. magnetising.* d. none of these.
412. The power developed by a synchronous motor is
 a. directly proportional to supply voltage.
 b. directly proportional to the excitation voltage.
 c. inversely proportional to synchronous reactance.
 d. all of the above.*
413. The torque angle of a synchronous machine operating from a constant voltage bus, is usually defined as the space angle between
 a. rotor mmf wave and stator mmf wave.*
 b. rotor mmf wave and resultant flux density wave.
 c. stator mmf wave and resultant flux density wave.
 d. stator mmf wave and resultant mmf wave.
414. A synchronous motor on load draws a current at a leading power factor angle ϕ . If the internal power angle _____ which is the phase angle between the excitation emf and the current in the phasor diagram is Ψ , then the air-gap excitation mmf lags behind the armature mmf.
 a. Ψ b. $\frac{\pi}{2} + \Psi$
 c. $\frac{\pi}{2} - \Psi$ d. $\Psi + \phi$ *
415. A synchronous motor will deliver maximum power when
 a. load angle is equal to internal angle α *
 b. input power factor in unity.
 c. load angle is 45°
 d. load angle is 0°
416. The power input to a synchronous motor operating at constant supply voltage and constant excitation will be maximum when load angle
 a. $\delta = \frac{\theta}{2}$ b. $\delta = 180^\circ - 2\theta$
 c. $\delta = 180^\circ - \theta$ * d. $\delta = \theta$
417. The power developed by a synchronous motor for constant supply voltage and constant excitation will be maximum when load angle δ is
 a. 90°
 b. 0°
 c. slightly less than 90° *
 d. slightly more than 90°
418. For a given developed power, a synchronous motor operating from a constant voltage and constant frequency supply, will draw the minimum and maximum armature currents, I_{\min} and I_{\max} respectively, corresponding to
 a. I_{\min} at unity pf, but I_{\max} at zero pf.*
 b. I_{\min} at unity pf, but I_{\max} at zero pf.
 c. both I_{\max} and I_{\min} at zero pf.
 d. both I_{\min} and I_{\max} at zero pf.
419. V-curves of a synchronous motor give relation between
 a. armature current and field current.*
 b. applied voltage and field current.
 c. power factor and field current.
 d. armature current and power factor.

420. An inverted V-curve of synchronous motor shows the variation of
- power factor and field current at constant load.*
 - supply voltage and field current at constant excitation.
 - power factor and supply voltage during hunting.
 - supply voltage and excitation current at constant load.
421. A synchronous motor operating at rated voltage draws 1.0 pu current at 1.0 power factor. The machine parameters are synchronous reactance 1.0 pu; armature resistance negligible. Apart from supplying this rated power, if the motor has to supply an additional reactive power of 0.8 pu, then the field current has to be increased by
- 42 %
 - 46 %*
 - 52 %
 - 69 %
422. Synchronous capacitor is
- an ordinary static capacitor bank.
 - an over-excited synchronous motor driving mechanical load.
 - an over-excited synchronous motor without mechanical load.*
 - none of the above.
423. A synchronous motor operating at leading power factor can be employed as a
- phase advancer.*
 - voltage booster.
 - mechanical synchroniser.
 - synchronous reactor.
424. Synchronous condensers, when operated at power factor ranging from lagging through unity to leading for voltage control, are called the
- voltage boosters.
 - synchronous reactors.*
 - mechanical synchronisers.
 - none of the above.
425. Which of the following devices can be used as a phase advancer ?
- 3-phase induction motor squirrel cage type.
 - 3-phase induction motor slip-ring type.
 - Synchronous motor working at leading power factor.*
 - Synchronous motor working at lagging power factor.
426. The phenomenon of oscillation of the rotor of a synchronous motor about its equilibrium position corresponding to new load on sudden throwing off or increasing of load is called the
- swinging.
 - crawling.
 - hunting.*
 - none of these.
427. A 3-phase synchronous motor hunts due to variations in
- supply voltage.
 - excitation.
 - supply frequency.
 - load.
 - any of the above.*
428. A 3-phase synchronous motor hunts due to
- fluctuating load.
 - fluctuating supply voltage.
 - excessive field current.
 - faulty connections.
 - either fluctuating load or fluctuating supply voltage.*
429. In a synchronous motor hunting can be reduced to minimum possible by
- providing damper winding in the rotor pole faces.
 - using a fly wheel.
 - designing the motor for adequate synchronizing power.
 - any of the above methods.*
430. In 3-phase synchronous motor, hunting is prevented by
- dummy coils.
 - compensating winding.
 - damper winding.*
 - shot-pitch winding.
431. The damper windings also called the squirrel cage windings or damper grids
- are provided in a synchronous motor to make it self-starting and to prevent hunting.
 - consists of short-circuited copper bars embedded in the field pole faces of a synchronous motor.
 - are provided on the stator of a synchronous motor for improving the power factor.
 - both (a) and (b).*
432. In a synchronous motor, squirrel cage winding is provided for making motor
- noise free
 - self starting*
 - cheap
 - quick start
433. Damper winding is used in a synchronous motor for
- power factor improvement.
 - efficiency improvement.
 - eliminating hunting of the rotor.*
 - minimising temperature rise.
434. Damper windings in a synchronous motor
- make it self starting and prevent its hunting.*
 - balances its rotor.
 - improves power factor.
 - reduces eddy current losses.
 - reduces noise level.
435. During hunting of synchronous motor
- negative phase sequence currents are generated.
 - harmonics are developed in the armature circuit.
 - damper bar develops torque.*
 - field excitation increases.
436. When a synchronous motor is running at synchronous speed, the damper winding produces
- damping torque.

- b. eddy current torque.
 c. torque aiding the developed torque.
 d. no torque.*
437. In a synchronous motor when the rotor speed exceeds the synchronous speed during hunting
 a. the damper bars develops synchronous motor torque.
 b. the damper bars develops induction generator torque.
 c. harmonics are produced in the armature circuit.*
 d. negative sequence currents are generated.
438. A pony motor is basically a
 a. small induction motor.*
 b. dc series motor.
 c. dc shunt motor.
 d. double winding ac/dc motor.
439. Starting torque of a synchronous motor is
 a. very low. b. zero.*
 c. very high. d. half-full load torque.
440. Which of the following electric motors is not inherently self starting motor ?
 a. Synchronous motor.*
 b. 3-phase induction motor.
 c. Reluctance motor.
 d. DC series motor.
441. The synchronous motor can be started by
 a. providing damper winding in its rotor circuit.
 b. coupling it with a dc compound motor.
 c. coupling it with a small ac induction motor called the pony motor.
 d. any of the above methods.*
442. The number of poles on a pony motor employed for starting of a 3-phase synchronous motor should be _____ that on the synchronous motor
 a. equal to b. more than
 c. lesser than* d. none of these
443. When a synchronous motor is started, the field winding is
 a. short-circuited.*
 b. open-circuited.
 c. excited from a dc source.
 d. excited from a 3-phase as source.
444. When a synchronous motor is started, the field winding is energized
 a. in the very beginning.
 b. when the motor attains a speed slightly less than the synchronous speed.*
 c. after the motor has attained the synchronous speed and synchronized.
 d. any time.
445. A 3-phase synchronous motor provided with damper winding is started as a 3-phase
 a. synchronous motor.
 b. synchronous alternator.
 c. induction motor.*
 d. induction generator.
446. A cylindrical rotor synchronous motor is switched on to the dc supply with its field windings shorted on themselves. It will
 a. not start.
 b. start but not run at synchronous speed.*
 c. start as an induction motor and then run as a synchronous motor.
 d. start and run as a synchronous motor.
447. If the field winding of a synchronous motor is short-circuited and the motor stator is connected to 3-phase as supply through an autotransformer, the motor will
 a. start and run as a 3-phase induction motor.*
 b. crawl.
 c. hunt.
 d. not start.
 e. start and run as a 3-phase synchronous motor.
448. While starting a synchronous motor its field winding should be
 a. kept open.
 b. short-circuited.*
 c. connected to a dc source.
 d. none of the above.
449. When a salient pole 3-phase synchronous motor is started by induction motor action and its field is connected across a field discharge resistance, starting torque is developed by
 a. reluctance torque due to saliency of the rotor.
 b. eddy current and hysteresis torque in pole faces.
 c. induction motor torque in field and damper windings.
 d. all of the above.*
450. Which of the following methods is employed for starting a 3-phase synchronous motor ?
 a. Star-delta starter.
 b. Damper winding.
 c. Resistance starter in the stator circuit.
 d. Damper winding in conjunction with a star-delta starter or an auto-transformer starter.*
451. While starting a 3-phase synchronous motor by induction motor action, very high emf is induced in the field winding. The damage to the insulation of field winding and slip-rings can be avoided by
 a. splitting the field winding in several sections.
 b. short-circuiting the field winding through field discharge resistance.
 c. either (a) or (b).*
 d. none of these.
452. Synchronous motors are inherently not self-starting motors as

- a. the direction of instantaneous torque on the rotor reverses after each half cycle.*
 b. there is no slip.
 c. the stator does not produce revolving magnetic field.
 d. it has no starting winding.

453. If fig given below, the characteristics that corresponds to the variation of a synchronous reactance of a synchronous motor with field current is
 a. curve I b. curve II*
 c. curve III d. curve IV



454. The standard full-load power factor ratings for synchronous motors is/are
 a. zero. b. unity.
 c. 0.8 lag. d. 0.8 lead.
 e. unity or 0.8 lead.*

455. Electrical machines (ac) should have proper _____ in order to limit the operating temperature.
 a. voltage rating. b. current rating.*
 c. speed. d. kw rating.
 e. pf rating.

456. The size of a synchronous motor reduces with the increase in
 a. speed. b. kw output rating.
 c. flux density.* d. any of these.

457. Which of the following synchronous motors will be smallest in size ?
 a. 5 kw, 375 rpm* b. 5 kw, 500 rpm
 c. 5 kw, 750 rpm d. any of these

458. During short-circuited test on a synchronous motor _____ is/are short-circuited.
 a. armature terminals*
 b. field terminals.
 c. all stator phase windings.
 d. one of the stator phase winding

459. The rotor copper losses of a synchronous motor are met by
 a. armature input. b. dc source.*
 c. ac supply mains. d. none of these.

460. In a synchronous motor _____ loss does not vary with load.
 a. Stator copper b. hysteresis
 c. windage* d. none of these

461. _____ losses have the high proportion of losses occurring in synchronous machines.

- a. Iron* b. Stator copper
 c. Friction and windage d. Eddy current

462. _____ losses are not dissipated from the stator core surface in a synchronous machine

- a. Stator core b. Windage*
 c. Eddy current d. Stator copper

463. The efficiency of a properly designed synchronous machine is of the order of

- a. 60% b. 80%
 c. 92%* d. 99%

464. The negative phase sequence in a 3-phase synchronous motor exists when the motor is

- a. under-loaded.
 b. over-loaded.
 c. supplied with unbalanced voltage.*
 d. hot.

465. In case one phase of a 3-phase synchronous motor is short-circuited the motor will

- a. not start.
 b. run at 2/3 of synchronous speed.
 c. run with excessive vibrations.
 d. take less than the rated load.*

466. A synchronous motor may fail to pull into synchronism owing to

- a. excessive load. b. low excitation.
 c. high friction. d. any of these.*

467. A synchronous motor may not run at its rated speed due to

- a. low supply voltage. b. excessive load.
 c. low field excitation. d. any of these.*

468. A 3-phase synchronous motor will not start if

- a. voltage is too low.
 b. one phase is open.
 c. connections are faulty.
 d. any of the above.*

469. Which of the following is not the advantage of a synchronous motor ?

- a. High operation efficiency.
 b. Operation over a wide range of power factor^{3/4} from lagging to leading.
 c. It can always be adjusted to operate at unity power for optimum efficiency and economy.
 d. Its rotor has 2 slip-rings.*
 e. Operation at constant speed from no-load to full load.

470. Which of the following is not the disadvantage of a synchronous motor?

- a. Its torque is less sensitive to variations in supply voltage.*
 b. DC excitation is required.

- c. It has tendency to hunt.
 d. Its starting under load is not possible.
 e. It is unsuitable for line shaft drive in a small workshop.
471. Which of the following synchronous motors has low cost comparable to that of an induction motor ?
 a. High kw output high speed.
 b. High kw output low speed.*
 c. Low kw output low speed.
 d. Low kw output high speed.
472. A 3-phase synchronous motor is widely used for
 a. power factor improvement.
 b. control of voltage at the end of a transmission line.
 c. high torque loads.
 d. fluctuating loads.
 e. both (a) and (b).*
473. A 3-phase synchronous motor is exclusively used where
 a. load fluctuates frequently.
 b. the speed is to be maintained absolutely constant.*
 c. very high speed is required.
 d. high torque loads are to be driven.
 e. speed regulation is required.
474. Synchronous motors are not used
 a. in power houses and substations in parallel to bus bars for pf correction.
 b. in factories having a large number of induction motors and other power apparatus operating at lagging power factor, for pf improvement.
 c. for driving electric trains, cranes, machine tools and line shaft drives.*
 d. in rubber mills, textile mills, cement factories, mining industries and other big industries for power applications.
 e. for driving continuously operating and constant speed equipment such as centrifugal pumps, fans, blowers, ammonia and air compressors, motor generator sets etc.
475. Synchronous motors are employed in
 a. small sizes.
 b. all sizes.
 c. larger sizes-higher than about 45 kw.*
 d. very larger sizes-higher than 500 kw.
476. The alternator are operated in parallel because it
 a. increases the reliability of supply.
 b. makes the repairing economical and convenient.
 c. is easy to instal an additional unit as and when required.
 d. all of the above.*
477. The condition(s) to be fulfilled for proper synchronising of 3-phase alternator is/are
 a. the terminal voltage of the incoming machine must be approximately equal to bus-bar voltage.
 b. the frequency of the incoming machine must be equal to that of bus bars.
 c. the phase of the incoming machine voltage must be the same as that of the bus bar voltage relative to load (the phase voltage of the incoming machine and those of bus-bar should be in phase opposition).
 d. the phase sequence of incoming machine voltage must be the same as that of the bus-bars.
 e. all of the above.*
478. Which of the following methods used for synchronising of 3-phase synchronous generators is considered best one ?
 a. Three dark lamp method.
 b. two-bright and one dark lamp method.
 c. Synchroscope.*
 d. none of these.
479. Which synchronising a 3-phase alternator to the bus-bar the paralleling switch should be closed
 a. just before the pointer reaches the vertical position when moving in the fast direction.*
 b. just after the pointer passes the vertical position when moving in the fast direction.
 c. when pointer indicates fast position.
 d. when pointer indicates slow position.
480. The two-bright and one dark lamp method is used for
 a. determining of phase sequence.
 b. synchronising of 3-phase alternators.*
 c. Synchronising of single phase alternators.
 d. transfer of load.
481. Desirable feature for success parallel operation of two alternator is that both should have
 a. same resistance.
 b. same reactance.
 c. high reactance in comparison to resistance.*
 d. low reactance in comparison to resistance.
482. Two alternators are operating in parallel. For taking one of the alternators out from the system
 a. load shared by this alternator is transferred to the other by adjusting the power fed to the prime-mover before opening OCB.*
 b. power fed to the prime-mover is stopped.
 c. OCB is switched off.
 d. load connected to the bus-bar is reduced.
483. Synchronising current means
 a. the total current supplied to the load by the alternators operating in parallel.
 b. the current supplied by the synchronous generator.
 c. the current circulating in the local circuit of two alternators operating in parallel which brings the alternators in synchronism once they are out it.*
 d. none of the above.
484. If the voltage of one of the two machines operating in parallel suddenly falls

- a. both the machines will stop.
 b. the machine whose voltage has suddenly decreased, will stop.
 c. the synchronous torque will come into operation to restore synchronism.*
 d. none of the above.
485. Synchronising torque will come into operation whenever
 a. there is a difference in the magnitude of voltages.
 b. there is a phase difference in the voltages.
 c. there is a frequency difference between the two voltages.
 d. excitation of one of the alternator is changed.
 e. in all of the above cases.*
486. If the excitation of one of the alternators operating in parallel is increased while keeping input to its prime-mover unchanged then the
 a. reactive components of the output will change.*
 b. active components of the output will change.
 c. power factors of the alternators will not change.
 d. kva supplied by the alternators will not change.
487. Two alternators A and B are sharing an inductive load equally. If the excitation of alternator A is increased
 a. alternator B will deliver more current and alternator A will deliver less current.
 b. alternator B will deliver less current and alternator A will deliver more current.*
 c. both will continue to share load equally.
 d. both will deliver more current.
488. Two alternator are operating in parallel. If the power input to the prime-movers of both the alternators is increased, this will affect change in
 a. generated emf. b. frequency.*
 c. terminal voltage. d. all of these.
489. Two similar synchronous generators are working in parallel to supply a common load demand with identical excitations and steam supplies to their prime-movers. Now, if the steam supply to the prime-mover of one of the generators is increased compared to the other, with field excitation kept unchanged, then
 a. its active power component will remain the same but the reactive power contribution will increase.
 b. its active power will decrease while the reactive power will increase.
 c. both active and reactive components of power will increase.
 d. its active power contribution will increase but reactive power contributions of both will remain unchanged.*
490. Two alternators are opening in parallel and sharing a common load. For increasing the load shared by one them
 a. power input is kept constant and excitation is increased.
 b. its active power will decrease while the reactive power will increase.
 c. both active and reactive components of power will increase.*
 d. its active power contribution will increase but reactive power contribution of both will remain unchanged.
491. Two alternators are operating in parallel and sharing a common load. For increasing the load shared by one of them
 a. power input is kept constant and excitation is increased.
 b. power input is kept constant and excitation is reduced.
 c. power input is increased keeping excitation constant.*
 d. power input is reduced keeping excitation constant.
492. The load shared between two alternators operating in parallel may be adjusted by varying
 a. their speed.
 b. their excitation.*
 c. power input to their prime-movers.
 d. any of the above.
493. The kva/kvar shared between two alternators operating in parallel sharing a common load are adjusted by varying
 a. their speed.*
 b. excitation.
 c. power input to their prime-movers.
 d. any of the above.
494. When two alternators are operating in parallel, if the power input to one of the alternators is cut-off, the alternator will
 a. continue to run as a synchronous motor rotating in the same direction.
 b. continue to run as a synchronous motor rotating in opposite direction.
 c. stop running.
 d. get damaged due to burning of stator and rotor windings.*
495. The following data pertain to two alternators working in parallel and supplying a total load of 80 MW:
 Machine 1 : 40 MVA with 5% speed regulation
 Machine 2 : 60 MVA with 5% speed regulation
 The load sharing between machine 1 and 2 will be
- | | P1 | P2 |
|----|-------|--------|
| a. | 48 MW | 32 MW |
| b. | 40 MW | 40 MW |
| c. | 30 MW | 50 MW |
| d. | 32 Mw | 48 MW* |

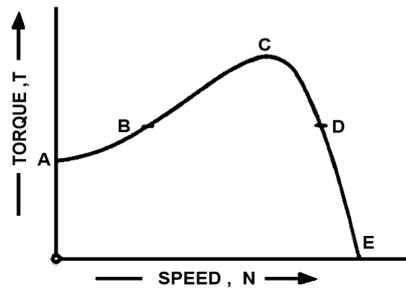
496. An infinite bus-bar has
- constant voltage.
 - constant frequency.
 - infinite voltage.
 - both (a) and (b).*
 - both (b) and (c).
497. If the excitation of an alternator connected to an infinite bus-bar is changed, keeping the power input to its prime-mover unchanged, its _____ will changed.
- kw output
 - power-factor
 - kva output
 - kvar output
 - all of the above except kw output*
498. A stationary alternator should not be connected to the live bus-bar because
- it is likely to operate as a synchronous motor.
 - it will get short-circuited.*
 - it will reduce bus-bar voltage.
 - all of the above.
499. A 3-phase synchronous generator with constant power input is supplying electrical power to an infinite bus at a lagging power factor. If its excitation is reduced
- both power factor and power angle will increase.*
 - both power factor and power angle will decrease.
 - power factor will improve but power angle will decrease.
 - power angle will increase but power factor will decrease.
500. A 3-phase synchronous generator with constant excitation is supplying electrical power to an infinite bus-bar at lagging power factor. If the power input is reduced
- both power factor and power angle will increase.
 - both power factor and power angle will increase.*
 - power factor will increase but power angle will decrease.
 - power factor will decrease but power angle will increase.
501. An alternator connected to an infinite bus, for a given excitation voltage, will develop maximum output power when the power angle δ and internal angle α are related as
- $\delta = 180^\circ - \alpha$
 - $\delta = 90^\circ - \alpha$
 - $\delta = \alpha$ *
 - $\delta = 180^\circ - 2\alpha$
502. An alternator connected to an infinite bus, for a given excitation, will develop maximum electro-magnetic power when
- $\delta = 180^\circ - \alpha$ *
 - $\delta = \alpha$
 - $\delta = 180^\circ - \frac{\alpha}{2}$
 - $\delta = 180^\circ - 2\alpha$
503. For a machine on infinite bus active power can be varied by
- changing field excitation.
 - changing of prime-mover speed.*
 - both (a) and (b) above.
 - none of the above.
504. If the prime-mover of an alternator supplying load to an infinite bus is suddenly shunt down, then it will
- stop
 - continue to run as an alternator.
 - continue to run as a synchronous motor in the reverse direction.
 - continue to run as a synchronous motor in the same direction.*
505. A salient-pole synchronous generator connected to an infinite bus will deliver maximum power at a power angle of
- $\delta = 0$.
 - $\delta = 90^\circ$.*
 - $\delta = 45^\circ$.
 - $\delta = 45^\circ$
506. The swing equation of a synchronous machine is given as
- $J \frac{d^2\delta}{dt^2} + D \frac{d\delta}{dt} = P_2(\delta)$
- Where $P_2(\delta)$ is the accelerating power as a function of power angle (δ). The kinetic energy of the rotor at synchronous speed, H and the frequency of supply, f are related as
- $J = \frac{2H}{\pi f}$
 - $J = \frac{H}{\pi f}$
 - $J = \frac{H}{2\pi f}$ *
 - $J = \frac{\pi H}{f}$
507. A large ac generator supplying power to an infinite bus, has a sudden short-circuit occurring as its terminals. Assuming the prime mover input and the voltage behind the transient reactance to remain constant immediately after the fault, the acceleration of the generator rotor is
- inversely proportional to the moment of inertia of the machine.*
 - inversely proportional to the square of the voltage.
 - directly proportional to the square of the short-circuit current.
 - directly proportional to the short-circuit power.
508. Four identical alternator each rated for 20 MVA, 11kv having a subtransient reactance of 16% are working in parallel. The short-circuit level at the bus-bars is
- 500 MVA.*
 - 400 MVA
 - 125 MVA.
 - 80 MVA.
509. A power station consists of two synchronous

- c. easy to cast owing to its low melting point and is easily available.*
d. of low resistivity.
526. In a 3-phase squirrel cage induction motor
a. rotor conductors are short-circuited through end rings.*
b. rotor conductors ends are short-circuited through slip rings.
c. rotor conductors are kept open.
d. none of the above.
527. The squirrel cage rotor of a 6-pole induction motor can be used for _____ induction motor.
a. only 6-pole b. 6 or 12 pole
c. any number of poles in an*
d. none of the above
528. The squirrel cage induction motors are provided with blades in order to
a. facilitate cooling of rotor.*
b. balance the rotor dynamically.
c. eliminate noise.
d. none of these.
529. The rotor of a 3-phase wound rotor induction motor is provided with
a. single phase-winding.
b. three phase winding.*
c. heavy copper or aluminium bars placed in rotor slots.
d. heavy short-circuited end rings.
530. In a 3-phase slip-ring induction motor, the rotor winding terminal are brought out through slip-rings to
a. connect extra resistance across them during starting.*
b. connect them either in star or in delta as per need.
c. connect to 3-phase ac supply.
d. close the rotor circuit externally.
531. The rotor winding for a 3-phase slip-ring induction motor having delta-connected stator must be connected in
a. delta.
b. star.*
c. delta or star according to need.
d. none of the above.
532. In a 3-phase slip-rings induction motor, brushes are connected to
a. external star-connected resistors.*
b. dc supply.
c. 3-f ac supply.
d. equalizing coils.
533. In a 3-phase wound rotor induction motor the short-circuit gear is used to short-circuit the
a. stator phases of the motor.
b. rotor at slip-rings.*
c. starting resistance in the stator.
d. none of the above.
534. Uneven gap in an induction motor is likely to cause
a. heating of motor.
b. unbalancing of motor shaft.
c. both (a) and (b).*
d. none of the above.
535. The value of air gap flux density in an induction motor is in the range of
a. 0.35 to 0.6 T.* b. 0.8 to 1.0 T.
c. 0.1 to 0.25 T. d. 2.5 to 3.5 T.
536. In an addition motor, the air gap flux density is usually kept low so as to
a. improve efficiency. b. improve power factor.*
c. reduce machine cost. d. none of the above.
537. Which of the following statements about a squirrel induction cage motor is incorrect ?
a. it has no commutator and no slip-ring.
b. it is provided with cage rotor which is simple, robust and almost intractable in construction.
c. It has high starting torque.*
d. Almost 90 percent of induction motors are of this type.
538. A 3-phase slip-ring induction motor has
a. short-circuited rotor. b. wound rotor.*
c. double cage rotor. d. none of the above.
539. A wound rotor induction motor can be distinguished from squirrel cage induction motor by
a. presence of slip-rings.* b. size of frame.
c. shaft diameter. d. any of the above.
540. The number of poles in a 3-phase induction motor is determined by the
a. supply frequency. b. motor speed.
c. supply voltage. d. Size of motor.
e. both (a) and (b).*
541. For induction motors normally
a. the stator winding is connected to a.c supply and the rotor winding is short-circuited.*
b. the rotor winding is connected to ac supply and the stator winding is short-circuited.
c. both of the stator and rotor windings are connected to ac supply.
d. stator winding is connected to ac supply and rotor winding to dc supply.
542. The operation of an induction motor is based on

559. The maximum possible speed of a 3-phase squirrel cage induction motor running at a slip of 4 % is
 a. 2,880 rpm.* b. 3,000 rpm.
 c. 1,440 rpm. d. 960 rpm.
560. An induction motor has synchronous speed of 1,500 rpm. What will be slip when it is running on a speed of 1,450 rpm?
 a. +3.33 %* b. -3.33 %
 c. +3 % d. -3 %
561. The full load slip of a 60 Hz, 12-pole squirrel cage induction motor is 5 %. Its full load speed is
 a. 600 rpm. b. 570 rpm.*
 c. 500 rpm. d. 475 rpm.
562. A 4-pole, 3-phase induction motor is running at 4 percent slip at full load. If the speed of the motor is 720 rpm, the supply frequency is
 a. $16\frac{2}{3}$ Hz b. 25 Hz.*
 c. 50 Hz. d. 60 Hz.
563. In an induction motor the slip will be negative when
 a. stator magnetic field and rotor rotate in opposite directions.
 b. rotor rotates at a speed less than synchronous speed and in the direction of rotation of stator field.
 c. rotor rotates at a speed more than synchronous speed and in the direction of rotation of stator field.*
 d. none of the above.
564. A 3-phase induction motor is operating at slip S. If its two supply leads are inter changed, then its slip at that instant will be
 a. $2 - s$.* b. $2 + s$.
 c. $1 + s$. d. $1 - s$.
565. The speed of rotating field due to rotor currents relative to rotor surface in an induction motor is
 a. N_s . b. $s N_s$.*
 c. N . d. $s N$.
566. The speed of rotating field due to rotor currents relative to stator core in an induction motor is
 a. N . b. $s N_s$.
 c. N_s .* d. $s N$.
567. The relationship between rotor frequency f_2 , slip S and the stator supply frequency f_1 is given by
 a. $f_1 = s f_2$. b. $f_2 = s f_1$.*
 c. $f_2 = f_1(1-s)$. d. $f_2 = \sqrt{sf}$
568. A 3-phase, 400 V, 4-pole induction motor is fed from a 3-phase, 400 V, 50 Hz supply and runs at 1,440 rpm. The frequency of rotor emf is
 a. 2 Hz.* b. 50 Hz.
 c. 48 Hz. d. zero Hz.
569. The frequency of rotor currents at standstill is equal to
 a. zero. b. $2f$.
 c. f .* d. $s f$.
570. The rotor of a 4-pole, 50 Hz, 3-phase slip-ring induction motor runs in clock-wise direction when its stator terminals 1,2,3 are connected to supply terminals A, B, C respectively. If 1,2,3, are connected to A, C, B, respectively of supply terminals and rotor runs in a clock-wise direction at synchronous speed, then the frequency of induced emf across the open-circuited rotor terminals is
 a. 50 Hz. b. zero.
 c. 25 Hz. d. 100 Hz.*
571. In a slip-ring induction motor, the frequency of rotor currents can be measured with a
 a. galvanometer.
 b. wattmeter.
 c. dc moving coil milli-voltmeter.*
 d. none of the above.
572. A voltmeter gives 120 oscillations per minute when connected to the rotor of an induction motor. The stator frequency is 50 Hz. The slip of the motor is
 a. 2% b. 2.5%
 c. 4%* d. 5%
573. A centre zero ammeter connected in the rotor circuit of a 6-pole, 50 Hz induction motor makes 30 oscillations in one minute. The rotor speed is
 a. 970 rpm. b. 990 rpm.*
 c. 1010 rpm. d. 1030 rpm.
574. For an induction motor under operating condition, the emf induced/phase in rotor circuit is _____ its standstill rotor induced emf per phase.
 a. equal to b. s times*
 c. $(1 - s)$ times d. $1/s$ times.
575. A 3-phase star-connected induction motor is connected to 400 V, 50 Hz ac supply. If the stator to rotor turn ration is 2, the standstill rotor induced emf per phase is
 a. 115.5 V.* b. 231 V.
 c. 346.5 V. d. 200 V.
576. In the above question, if the rotor rotates at 950 rpm, then the rotor induced emf per phase is
 a. 115.5 V. b. 57.75 V.
 c. 346.5 V.* d. 11.55 V.
577. In a 3-phase induction motor, the rotor current is produced by
 a. induction effect.* b. Lenz's law.
 c. rotor supply. d. none of these.
578. The direction of rotor current produced in an induction motor can be determined by
 a. Lenz's law.
 b. induction law.

- c. Fleming's right hand rule.*
d. Fleming's left hand rule.
579. In case of an induction motor the leakage flux is more in comparison to that of a transformer. This is due to
a. revolving rotor.
b. air gap between rotor and stator.*
c. higher flux densities in induction motor.
d. none of the above.
580. In an induction motor the phase reactance is _____ in comparison to phase resistance.
a. quite high* b. very small
c. slightly high d. almost same
581. In a 3-phase induction motor reactance under running condition is less than its standstill value. This is due to reduction in
a. rotor inductance.
b. stator magnetic flux.
c. frequency of rotor emf.*
d. mutual flux linking the stator and rotor.
582. In an induction motor under running condition, the rotor reactance per phase is _____ its standstill phase reactance.
a. s times* b. equal to
c. 1/s times d. (1 - s) times
583. If E_2 is the standstill rotor phase emf, I_2 is the standstill rotor phase current and $\cos \phi_2$ is the rotor power induction motor varies as
a. $E_2 I_2$ b. $E_2 I_2 \cos \phi_2$ *
c. $E_2 / I_2 \cos \phi_2$ d. $E_2 / I_2 \cos \phi_2$
584. The torque developed by 3-phase induction motor depends upon
a. rotor phase resistance
b. rotor standstill phase reactance.
c. applied voltage.
d. slip.
e. all of the above.*
585. The torque developed by a 3-phase induction motor varies as
a. V b. V^2 *
c. \sqrt{V} d. $\frac{1}{V}$
586. The torque developed by a 3-phase induction motor is approximately proportional to
a. \sqrt{s} b. s^2
c. s^* d. $1/s$
587. Insertion of resistance in the rotor circuit of an induction motor to develop a given torque causes _____ in order current.
a. almost no change.* b. increase.
c. decrease. d. none of these.
588. In an induction motor if the flux density is reduced to one-half of its normal value then the torque will
a. reduce to one half.*
b. reduce to one-fourth.
c. remain unchanged.
d. increase four times.
589. The starting torque for a 3-phase induction motor is proportional to
a. $\frac{R_2}{X_2}$ b. $\frac{X_2}{R_2^2 + X_2}$
c. $\frac{X_2}{R_2^2 + X_2^2}$ * d. $\frac{X_2}{R_2 + X_2}$
590. The starting torque of a 3-phase induction motor varies as
a. V^2 * b. V
c. \sqrt{V} d. $\frac{1}{V}$
591. The starting torque of a squirrel cage induction motor is
a. very large.
b. very low.
c. slightly more than full load torque.*
d. zero.
592. For achieving high starting torque and high operation efficiency and induction motor should have _____ rotor circuit resistance at starting and _____ circuit resistance under operating condition.
a. high, low* b. low, high
c. high, high d. low, low
593. In a 3-phase slip-ring induction motor high starting torque is achieved by
a. increasing supply voltage V.
b. increasing supply frequency f.
c. connecting a capacitor across the motor terminals.
d. connecting a star-connected resistance across the slip-ring terminals of the motor.*
594. In a 3-phase induction motor, the starting torque will be maximum when
a. $R_2 = \frac{1}{X_2}$ b. $R_2 = X_2$ *
c. $R_2 = X_2^2$ d. $R_2 = \sqrt{X_2}$
595. In a 3-phase induction motor, the maximum torque
a. is independent of rotor circuit resistance.*
b. varies as rotor resistance.
c. varies as the square of rotor resistance.
d. varies inversely as rotor circuit resistance.
596. In a 3-phase induction motor, if stator impedance is neglected, then the slip at maximum torque is equal to

- a. $\frac{x_2}{r_2}$ b. $\frac{r_2}{x_2}$ *
- c. $= \sqrt{\frac{r_2}{x_2}}$ d. $= \sqrt{\frac{x_2}{r_2}}$
597. An induction motor has a rotor resistance of 0.002 ohm/phase. If the resistance is increased to 0.004 ohm/phase then the maximum torque will
- a. reduce to half. b. increase by 100%.
c. increase by 200% d. remain unaltered.*
598. In an induction motor, maximum torque varies as
- a. $\frac{V}{X_2}$ b. $\frac{V^2}{X_2}$ *
c. $\frac{V}{R_2}$ d. $\frac{V}{X_2^2}$
599. Breakdown torque of a 3-phase induction motor of negligible stator impedance is
- a. directly proportional to the rotor resistance.*
b. inversely proportional to the rotor resistance.
c. directly proportional to the reactance.
d. inversely proportional to the rotor leakage reactance.
600. If the rotor circuit, resistance is increased in an induction motor, the maximum torque will occur at
- a. lower speed. b. high speed.*
c. the same speed. d. none of these.
601. The pull-out torque for a normal squirrel cage induction motor usually occurs at a slip ranging from
- a. 0.1 to 0.15 b. 0.2 to 0.25
c. 0.4 to 0.5* d. 0.5 to 0.6
602. Beyond the point of maximum torque any further increase in load will cause
- a. increase in torque developed and so the motor will run at a high speed.*
b. no change in the torque developed and so the motor will run at the same speed as before.
c. decrease in torque developed and the motor will slow down.
d. increase in current drawn from the supply mains resulting in damage to it.
603. The torque-slip characteristics of a polyphase induction motor becomes almost linear at small values of slip, because in this range of slips
- a. the effective rotor circuit resistance is very large compared to the rotor reactance.
b. the rotor resistance is equal to the stator resistance.*
c. the rotor resistance is equal to the rotor reactance.
d. the rotor resistance is equal to the stator reactance.
604. In a 3-phase induction motor if the leakage reactance is reduced by using open slots
- a. starting torque and starting current will decrease but power factor will increase.*
b. starting torque and starting current both will increase but power factor will decrease.
c. pull-out torque will decrease.
d. starting current will increase but starting torque will decrease.
605. An increase in rotor circuit reactance of a 3-phase induction motor will
- a. reduce starting torque as well as maximum torque.
b. increase starting torque as well as maximum torque.
c. increase starting torque and reduce maximum torque.
d. increase maximum torque and reduce starting torque.*
606. In the torque-speed characteristics of an induction motor shown in the figure given below, stable region is
- a. AB b. BC*
c. CD d. DE



607. The torque-slip characteristics of an induction motor is approximately a/an
- a. straight line. b. rectangular parabola.
c. parabola.* d. hyperbola.
608. Stable operation of an induction motor is
- a. between zero slip and unity slip.
b. between 0.5 slip and 0.95 slip.
c. between zero slip and slip corresponding to maximum torque.
d. between slip corresponding to maximum torque and unity slip.*
609. With the increase in load on a squirrel cage induction motor
- a. stator current increases.
b. power factor improves.
c. slip increases.
d. the torque developed by the motor increases till it becomes equal to the load torque.
e. all of the above.*
610. Whenever any polyphase induction motor is loaded
- a. motor speed decreases.
b. stator flux cuts the rotor bars more rapidly.
c. emf induced in the rotor as well as its frequency increases.

- d. current in rotor bars increases.
e. all of the above.*
611. The losses that occur in an induction motor are
a. stator copper loss.
b. stator iron loss.
c. rotor copper loss.*
d. windage and friction losses.
e. all of the above.
612. In a 3-phase induction motor iron loss mainly are
a. stator and rotor.*
b. rotor core and rotor teeth.
c. stator core and stator teeth.
d. stator winding.
613. Iron loss in the rotor of a 3-phase induction motor is negligible. This is due to
a. very low frequency of emf induced in the rotor.
b. very low emf induced in the rotor.*
c. very low flux density in rotor parts.
d. the fact that the rotor core is laminated.
e. constant magnitude of flux linking the rotor core.
614. Copper loss in rotor of an induction motor
a. appears as noise.* b. appears as heat.
c. lost in friction. d. lost in windings.
615. Rotor input of a three phase induction motor is equal to
a. input to motor-stator copper and iron losses.
b. mechanical power developed-windage and friction losses.
c. input to motor-windage and friction losses.
d. input to motor-stator iron losses-windage and friction losses.*
616. In an addition motor, slip depends upon
a. supply frequency. b. rotor input power.*
c. rotor copper losses. d. both (b) and (c)
617. The slip of an induction motor is given as
a. rotor output power/rotor input power.
b. rotor copper loss/rotor input power.
c. rotor copper loss/rotor output power.*
d. rotor output power/input power to motor.
618. If P_g is the air-gap power or input power to rotor and s is the slip then rotor copper loss is given as
a. $(1 - s)P_g$ b. P_g/s
c. $s P_g$ d. $P_g/(1 - s)$ *
619. In a 3-phase induction motor, the mechanical power developed, in terms of air-gap power P_g is
a. $(s - 1)P_g$ b. $\frac{P_g}{1 - s}$ *
c. $\frac{1}{s}$ d. $(1 - s)P_g$
620. The rotor power output of a 3-phase induction motor is 15 kw and the corresponding slip is 4%. The rotor copper loss will be
a. 600 W. b. 625 W.
c. 650 W. d. 700 W.*
621. The torque of a 3-phase induction motor depends on
a. rotor input.*
b. rotor copper losses.
c. friction and slip.
d. all of these.
622. The synchronous watt is
a. the torque which under synchronous speed would develop a power of 1 watt of power input to rotor in watts.
b. shaft output in watts.
c. input power to stator.*
d. the unit of ratings of synchronous machines.
623. The no-load current in an induction motor is approximately _____ per cent of full-load current.
a. 2 b. 10*
c. 30 d. 60
624. The no-load current in an induction motor is _____ in comparison to that of a power transfer.
a. much lower b. much higher
c. slightly less* d. slightly more
625. The equivalent circuit per phase of a three phase transformer is similar to that of a three phase induction motor but the transformer does not develop any torque. This is due to
a. insufficient voltage.*
b. low supply frequency.
c. non-fulfillment of condition of space condition of winding.
d. none of the above.
626. The resistance R_0 of the exciting branch of the equivalent circuit of a 3-phase induction motor represents
a. stator core loss only.
b. stator copper loss only.
c. stator and rotor copper losses only.*
d. friction and windage losses only.
e. stator core and copper losses.
627. In a 3-phase induction motor, the variable mechanical load is represented electrically by a variable _____ only.
a. induction b. capacitance
c. resistance* d. any of these
628. An induction motor has rotor resistance R_r , stand-still rotor induced voltage E_{ss} , and stator to rotor effective turn-ratio of m . In an equivalent circuit of this machine, the rotor circuit resistance is shown as $m^2 R_r/s$, where s is the slip. This implies that the value of the equivalent rotor circuit voltage will be
a. E_{ss} b. $s E_{ss}$ *

- c. mE_{ss} d. msE_{ss}
629. The stator referred resistance in the equivalent circuit of an induction motor, representing mechanical output is
- a. $\frac{r_2}{s}$ * b. $r_2 = \left(\frac{1}{s} - 1\right)$
- c. $\frac{r_2}{s}$ d. $r_2^2 = \left(\frac{1}{s} - 1\right)$
630. The output power of a 3-phase induction motor will be maximum when the equivalent load resistance is equal to the stand-still leakage _____ of the motor.
- a. impedance, Z'_1 b. reactance, X'_1 *
c. resistance d. capacitance
631. The power factor of an induction motor at no load is around
- a. 0.2 lag b. 0.2 lag
c. 0.5 lag* d. 0.8 lag
632. The power factor of an induction motor at full load is likely to be
- a. unity* b. 0.85 lead
c. 0.85 lag d. 0.5 lag
633. The power factor of a 3-phase induction motor is likely to be maximum when it will operate at
- a. full load.* b. no-load.
c. maximum slip. d. maximum torque.
634. The power factor of a lightly loaded induction motor is quite low because
- a. the current drawn is largely a magnetising current due to air-gap.*
b. of the current due to air-gap.
c. the current drawn is largely a magnetising components due to laminated core.
d. the current drawn is largely an energy component due to laminated core.
635. The power factor of a squirrel cage induction motor is
- a. low at light load only.
b. low at heavy loads only.*
c. low at light and heavy loads both.
d. low at rated load only.
636. In a 3-phase induction motor when the load is increased from light load
- a. rotor pf increases but stator pf decreases.
b. stator pf increases but the rotor pf decreases.
c. both stator and rotor pf increase.
d. both stator and rotor pf decrease.*
637. An induction motor always operates on lagging power factor. This is due to
- a. stator reactance.*
b. rotor leakage reactance.
- c. the large reactive lagging magnetizing current essential to produce the magnetic flux.
d. all of the above.
638. In which of the following tests to be conducted on induction motors, reduced voltage is applied.
- a. Blocked rotor test. b. No-load test.*
c. Both (a) and (b). d. None of these.
639. In induction motors, the short-circuit test is _____ test.
- a. no load b. blocked rotor
c. stator resistance d. open-circuit*
640. Blocked rotor test of an induction motor corresponds, in case of transformer, to
- a. full load
b. half-full load
c. no load
d. short-circuit operation*
641. The core losses, and friction and windage losses in case of an induction motor are determined from the _____ test.
- a. no-load b. blocked rotor
c. load d. stator resistance*
642. Short-circuit test is performed on an induction motor to determine
- a. short-circuit current under rated voltage.
b. equivalent resistance and reactance.
c. transformation ratio.
d. power factor on short-circuit.
e. all of the above.*
643. When the induction motor is standstill the slip is
- a. Zero b. 1*
c. infinity d. none of the above
644. Circle diagram is employed to determine the performance of a/an
- a. synchronous motor b. induction motor*
c. dc motor d. transformer
645. Complete circle diagram of an induction motor can be drawn from
- a. no-load test data only.
b. blocked rotor test data only.
c. stator resistance test data only.
d. no-load, blocked rotor and stator resistance test data.*
646. The power scale of circle diagram of an induction motor is determined from _____ test data only.
- a. open-circuit
b. stator resistance
c. short-circuit*
d. slip
647. In the circle diagram of an induction motor the diameter of the circle represents the

- a. rotor current* b. line voltage
c. operating torque d. maximum torque
648. Circle diagram of an induction motor can be used to determine its
a. power factor b. efficiency
c. output d. slip
e. all of the above*
649. An induction motor is said to be crawling when
a. it runs at one-seventh of rated speed.*
b. it accelerates too fast.
c. it is subjected to fluctuating loads.
d. it is started on full load.
650. If an induction motor with certain ratio of rotor to stator slots, runs at 1/7th of the normal rated speed, the motor is said to be
a. hunting b. crawling*
c. cogging d. jogging
651. The presence of a dominant 7th harmonic in the winding distribution of a 3-phase, 6-pole, 50 Hz induction motor may cause the motor to crawl at a speed of about
a. 750 rpm b. 500 rpm
c. 242 rpm d. 143 rpm*
652. The crawling occurs in induction motor due to
a. low supply voltage.
b. over load.
c. harmonics developed in the motor.
d. jammed bearings.*
e. improper design of machine.
653. Crawling of induction motor occurs due to
a. harmonics synchronous torques.
b. harmonic induction torques.
c. vibration torques.
d. both (a) and (b).*
654. Presence of 5th harmonics in induction motor causes
a. cogging
b. crawling
c. small reverse braking torque*
d. hunting
655. The term cogging is associated with _____ motors.
a. induction* b. repulsion
c. dc series d. dc shunt
656. The cogging occurs in induction motors due to
a. harmonic induction torques.
b. harmonic synchronous torques.*
c. vibration torques.
d. both (a) and (b).
657. Cogging of induction motors occurs at
a. high voltage and when the number of stator teeth and rotor teeth are equal.
b. high voltage and when the number of stator teeth and rotor teeth are not equal.
c. low voltage and when the number of stator teeth and rotor teeth are equal.*
d. low voltage and when the number of stator teeth and rotor teeth are not equal.
658. Cogging and crawling are phenomenon associated with
a. cage induction machines and they are essentially the same.
b. squirrel cage induction machines, the former during starting and the latter at a fraction of its rated speed.*
c. squirrel cage induction machines, the former at a fraction of its rated speed and the latter during starting.
d. wound rotor induction machines and they are reduced by skewing, chording and distribution of windings.
659. A 5hp, 400 V, 4-pole, 50 Hz induction motor having 36 slots in the stator and 40 slots in the rotor may crawl synchronously at
a. 50 rpm b. 150 rpm*
c. 200 rpm d. 750 rpm
660. In an induction motor, if the air-gap is increased
a. speed will reduce.
b. efficiency will improve.
c. power factor will be lowered.*
d. breakdown torque will reduce.
661. If two induction motors A and B are identical except that the air-gap of motor 'A' is 50% greater than that of motor 'B' then
a. the no-load power factor of A will be better than that of B.
b. the no-load power factor of A will be poorer than that of B.*
c. the core losses of A will be more than those of B.
d. The operating flux of A will be smaller than that of B.
662. An increase in number of poles of an induction motor results in
a. decrease in maximum pf.*
b. increase in maximum pf.
c. no change in maximum pf.
d. cannot be predicted.
663. Leakage reactance per phase of the stator of a polyphase induction motor is 1.0 ohm. The turns per phase of the stator are increased by 10%. The leakage reactance is then equal to
a. $(1.1)^2$ * b. $(0.9)^2$
c. $1/(1.1)^2$ d. $1/(0.9)^2$
664. Leakage reactance per phase induction motor is kept small to
a. reduce the possibility of crawling.
b. reduce the noise.
c. reduce magnetizing current.*
d. obtain high starting torque.

665. Increase in length of air-gap in an induction motor causes
- decreases in power factor.
 - decreases in pulsation losses.
 - increase in ampere-turns required to produce same flux density in the air gap.
 - all of the above.*
666. Decrease in length of air-gap between the stator and rotor of an induction motor will improve
- motor efficiency
 - starting torque
 - power factor*
 - pull-out torque
667. An induction motor with larger number of slots has _____ over-load capacity.
- low
 - large*
 - no effect on
 - none of these
668. The 3-phase induction motor provided with open slots has
- reduced leakage reactance.
 - increased starting current, starting torque and break down torque.
 - better pf.
 - both (a) and (b).*
669. Semi-closed or totally closed slots are used in induction motor essentially to
- improve pull-out torque.
 - increase pull-out torque.
 - increase efficiency.
 - reduce magnetizing current and improve power factor.*
670. The stator of a small (upto 5 hp) induction motor is provided with
- open slots with parallel teeth.
 - open slots with tapered teeth.
 - semi-closed slots with parallel teeth.*
 - totally closed slots with parallel teeth.
671. "Cogging" in induction motor occurs when
- number of stator teeth-number of rotor teeth = odd number.
 - number of stator teeth-number of rotor teeth = odd number.
 - number of stator teeth-number of rotor teeth = 0*
 - number of stator teeth-number of rotor teeth = negative number.
672. To avoid cogging in a squirrel cage induction motor the following stator slot (Z_1) and rotor slot (Z_2) combination must be avoided.
- $Z_1 = Z_2$ *
 - $Z_1 - Z_2 = 2P + 1$
 - $Z_1 - Z_2 = 3P + 1$
 - $Z_1 - Z_2 = 3P - 1$
673. In a 3-phase induction motor, the stator slots are
- equal to rotor slots.
 - exact multiple of rotor slots.
 - not exact multiple of rotor slots.*
 - none of the above.
674. In a 3-phase induction motor, the number of slots on stator is not kept an exact multiple of the number of rotor slots because it
- facilitates cooling.
 - avoids magnetic locking between stator field and rotor.*
 - improves efficiency.
 - improves pf.
675. The difference between the number of stator slots and that of rotor slots in an induction motor should not be equal to P, 2P or 5P. It is essential in order to avoid
- synchronous cusps.
 - crawling.*
 - magnetic locking.
 - noise and vibrations.
676. In induction machines, it is usually a standard practice to employ
- integral-slot winding with full pitch coils.
 - integral-slots winding with chorded coils.*
 - fractional slot winding with fractional pitch coils.
 - fractional slot winding with full pitch coils.
677. The rotor slots in a 3-phase induction motor are kept inclined. This phenomenon is known as
- skewing*
 - crawling
 - cogging
 - none of these
678. In an induction motor, skewing of rotor bars reduces
- eddy currents and copper requirement.
 - noise, vibrations and synchronous cusps.*
 - both (a) and (b).
 - none of these.
679. Rotor slots of a squirrel cage induction motor are skewed slightly in order to
- increase mechanical strength of rotor.
 - make the rotor construction simple.
 - reduce magnetic hum and avoid magnetic locking tendency of the rotor.*
 - increase slip for a given torque.
680. Skew of rotor bar eliminates
- the effect of space harmonics.
 - the entire effect of crawling.
 - magnetic noise.*
 - vibration due unequal force developed on rotor.
681. Which of the following statement regarding skewing of rotor bars in a squirrel cage induction motor are correct ?
- it prevents cogging.
 - it produces more uniform torque
 - it increases starting torque.
 - it reduces motor 'hum' during its operation.
- Select the answer using the codes given below
- 2, 3, 4
 - 1, 2, 3
 - 1, 2, 4*
 - 1, 3, and 4
682. _____ helps in prevent cogging in induction

- motors.
- a. Skewed slots*
 - b. High slip
 - c. Larger number of poles
 - d. Use of high quality insulation material
683. Jogging of an induction motor is
- a. energizing a motor once or repeatedly to have small movements for mechanisms.*
 - b. a process of synchronisation.
 - c. a method of braking.
 - d. none of the above.
684. In 3-phase induction motors, sometimes copper bars are placed deep in the rotor. It is done in order to improve
- a. efficiency
 - b. starting torque*
 - c. power factor
 - d. none of these
685. In a squirrel cage induction motor high starting torque is achieved by using
- a. high resistance in series with the rotor circuit.
 - b. low resistance across the rotor circuit.
 - c. double cage rotor.*
 - d. none of these.
686. A double cage induction motor is a
- a. slip-ring type
 - b. squirrel cage type.*
 - c. combination of squirrel cage and slip ring induction motors.
 - d. commutator type.
687. The outer cage of a double squirrel rotor consist of
- a. manganese brass.*
 - b. red copper.
 - c. bronze.
 - d. steel.
688. In double cage induction motor the inner cage has
- a. high resistance and high leakage reactance.
 - b. high resistance and low leakage reactance.
 - c. low resistance and high leakage reactance.*
 - d. low resistance and low leakage reactance.
689. A double squirrel cage induction motor has
- a. two series windings in stator.
 - b. two series windings in rotor.
 - c. two parallel windings in rotor.*
 - d. two parallel windings in stator.
690. In a double cage induction motor outer cage used for starting has
- a. high resistance and low leakage reactance.*
 - b. high leakage reactance and low resistance.
 - c. high resistance and high leakage reactance.
 - d. low resistance and low leakage reactance.
691. In a double squirrel cage induction motor, the resistance of upper cage is _____ that of inner cage.
- a. equal to
 - b. 4 to 5 times of*
 - c. one-fourth of
 - d. none of these.
692. Motor A has shallow and wider slots. Motor B has deeper and narrow slots. If both are 3-phase 400 V, 50 Hz, 1440 rpm induction motor. It can be concluded that
- a. Motor A has more starting torque as compared to motor B.
 - b. Motor B has more starting torque as compare to motor A.*
 - c. Motor A has more pull-out torque as compared to motor B.
 - d. Motor B has more pull-out torque as compared to motor A.
693. The deep-bar rotors or double cage rotors are employed to
- a. increase starting toque.*
 - b. improve efficiency.
 - c. increase pull-out torque.
 - d. reduce rotor core loss.
694. During starting of a double cage induction motor, the current induced in the rotor
- a. flows mostly through the lower cage.
 - b. flows mostly though the upper cage.*
 - c. is equally divided between the two windings.
 - d. none of the above.
695. While drawing an equivalent circuit diagram of a double cage induction motor, the two cages may be considered connected in
- a. parallel.*
 - b. series.
 - c. series-parallel.
696. Double cage induction motor, over an ordinary squirrel cage induction motor, has the advantage(s) of
- a. larger slip.
 - b. higher efficiency.
 - c. higher power factor.
 - d. reduced starting current.*
697. Which of the following statements about a double cage induction motor is incorrect ?
- a. it maintains higher efficiency during normal running conditions.
 - b. it is particularly useful where frequent starting under heavy loads is required.
 - c. it has better speed regulation than an ordinary squirrel cage induction motor.*
 - d. its starting current is comparatively smaller than that of an ordinary squirrel cage and slip-ring induction motors.
 - e. it has comparatively lower copper losses.
698. Squirrel cage induction motors have the advantages of
- a. cheaper in initial as well as in maintenance costs.
 - b. nearly constant speed, high over-load capacity, simple starting arrangement and high power factor.
 - c. lower copper losses and higher operation efficiency.
 - d. all of the above.*

699. Squirrel cage induction motors have the disadvantages of
- higher starting current and poor starting torque.
 - high sensitivity of fluctuations in supply voltage and low power factor at light-load.
 - no possibility of speed regulation.
 - all of the above.*
700. Slip-ring induction motors have the advantages of
- high starting torque and high over-load capacity.
 - nearly constant speed.
 - low starting current in comparison to squirrel cage induction motor.
 - all of the above.*
701. Slip-ring motors have the disadvantages of
- low efficiency and low power factor in comparison to squirrel cage induction motors.
 - low power factor at light-load.
 - sensitivity to fluctuations in supply voltage.
 - all of the above.*
702. Slip-ring motors have the disadvantages of
- low efficiency and low power factor in comparison to squirrel cage induction motors.
 - low power factor at light-load.
 - sensitivity to fluctuations in supply voltage.
 - all of the above.*
703. For high starting torque, the most suitable 3-phase induction motor is _____ induction motor.
- slip ring*
 - squirrel cage
 - double cage
 - deep bar squirrel cage
704. Which of the following ac motor is widely used ?
- Squirrel cage induction motor.*
 - Slip-ring induction motor.
 - Double cage induction motor.
 - Synchronous motor.
705. A squirrel cage induction motor is not favoured when _____ is the main consideration.
- initial cost
 - maintenance cost
 - high starting torque*
 - higher efficiency and higher power factor
706. A slip-ring induction motor is recommended for applications requiring
- high starting torque.
 - variable speed operation.
 - frequent starting, stopping and reversing operations.
 - all of the above features.*
707. Induction motors, over synchronous motors, have the advantages of
- being self starting.
 - having no requirement for dc excitation.
 - possibility of speed control of small extent.
 - simplicity and lower cost.
 - all of the above.*
708. If the full load speed of a 3-phase induction motor is 960 rpm, its speed at half load will be approximately
- 960 rpm
 - 1,000 rpm
 - 975 rpm*
 - 900 rpm
709. Unbalanced 3-phase voltage supply to an induction motor causes excessive heating of
- rotor.*
 - stator.
 - rotor shaft.
 - none of these.
710. If a 3-phase induction motor is to be operated on unbalanced power supply, then it should be operated at
- higher loads.
 - lower loads.*
 - higher speeds.
 - lower speeds.
711. A 3-phase induction motor is operating on 3-phase balanced supply. Suddenly one of the fuses blows off and the motor continues running. Such an operation of motor is called
- crawling.
 - single phasing.
 - cogging.*
 - jogging.
 - hunting.
 - unbalancing.
712. Single phase preventer
- suppresses negative sequence currents.
 - compensates for voltage drops.
 - provides protection in the event, of non-availability of one of the phases.*
 - none of the above.
713. An induction motor is fed from a balanced three phase supply at rated voltage and frequency through a bank of three single phase transformers connected in delta-delta. One unit of the bank develops fault and is removed. Then
- single phasing will occur and the machine fails to start.*
 - single phasing will not occur but the motor terminal voltages will become unbalanced and the machine can be loaded to the extent of 57.7% if its rating.
 - the machine can be loaded to the extent of 57.7% of its rating with balanced supply at its terminals.
 - the machine can be loaded to the extent of $66\frac{2}{3}\%$ of its rating with balanced supply at its terminals.
714. If a 3 phase induction motor is started when one of the phases is not available, then the motor
- will hum but no start.
 - will continue to operate satisfactorily on load below 57.7 % of rated load is brought up to speed by some external means.
 - will operated under reduced load but usually with considerable vibrations in case of wound rotor

- motor is brought up to speed by some external means.
- start and operate at a lower speed.
 - all of the above except (d).*
715. If one of the 3-phase of supply to an induction motor fails, may be due to any reason, when the motor is running normally, the motor will
- continue running at the same speed it is was running on light load.
 - continue running but will draw more current if it was operating at rated load.
 - stop and carry heavy current causing permanent damage to the windings if it was operating overloaded.
 - all of the above.*
716. Consider the following statements.
In a 3-phase induction motor connected to a 3-phase supply; if one of the lines suddenly gets disconnected, then the
- motor will come to a standstill.
 - motor will continue to run at the same speed with line current unchanged.
 - motor will continue to run at a slightly reduced speed with increase in line current.
 - rotor current will have both of $s f$ and $(2 - s) f$ component frequencies where s is the slip and f is the supply frequency.
- Of these statements
- 1 and 4 are correct.
 - 1 and 2 are correct.
 - 3 and 4 are correct.*
 - 2 and 3 are correct.
717. Increase in supply voltage to a 3-phase induction motor will not cause
- decrease in input current and so reduction in copper losses.
 - increase in torque.
 - decrease in speed as well as in core loss.*
 - operating temperature abnormally higher owing to increase in core loss.
718. Decrease in supply voltage to a 3 phase induction motor will not cause
- any difficulty in accelerating the load.
 - increase in torque.*
 - decrease in speed as well as in core loss.
 - increase in stator as well as rotor currents.
 - operating temperature abnormally higher owing to increase in core loss.
719. A 3-phase induction motor is operating at its rated torque. If the supply voltage falls to 75% of its normal value,
- the motor will get heated up to inadmissible extent after some time.*
 - the motor will stop.
 - the slip will decrease.
 - the stator and rotor current will decrease.
720. When the supply voltage to an induction motor is reduced by 10%, the maximum torque will decrease by approximately
- 5%
 - 10%
 - 20%*
 - 40%
721. An induction motor having full-load torque of 60 Nm when delta connected develops a starting torque of 120 Nm. For the same supply voltage, if the motor is changed to star-connection, the starting torque developed will be
- 40 Nm.*
 - 60 Nm.
 - 90 Nm.
 - 120 Nm.
722. A 3-phase, 480 V, 60 Hz induction motor is to be operated at 50 Hz supply. The most satisfactory supply voltage for the machine would be
- 480 V.
 - 400 V.*
 - 600 V.
 - 440 V.
723. If a 3-phase 350 V, 50 Hz, 1440 rpm induction motor is operated on 420 V, 60 Hz supply, then the torque will
- increase.
 - decrease.
 - remain unchanged.*
 - none of these.
724. The starting torque of an induction motor varies as
- f
 - $\frac{1}{f^2}$ *
 - $\frac{1}{f}$
 - f^2
725. With the increase in supply frequency _____ decrease(s).
- starting current
 - starting torque
 - full load current
 - maximum running torque
 - starting and full load currents and starting and maximum running torque*
726. This size of a high speed motor is _____ in comparison to that of a low speed motor for the same kw output
- smaller*
 - larger
 - almost the same
 - unpredictable
727. The cost of a high speed motor is _____ in comparison to that of a low speed motor for the same kw output.
- high
 - low*
 - almost the same
 - unpredictable
728. Which of the following induction motors will operate on the lowest value of power factor ?
- 7.5 kw, 950 rpm*
 - 7.5 kw, 1440 rpm
 - 15 kw, 950 rpm
 - 15kw, 1440 rpm
729. For starting a 3-phase induction motor _____ winding is to be connected to 3-phase as supply.
- rotor
 - stator*

- c. both stator and rotor d. none
730. The starting current of a 3-phase induction motor is about _____ of its full-load rated current.
- a. half b. twice
c. 5 to 7 times* d. 15 to 20 times
731. An induction motor employs a starting device to restrict _____ at start.
- a. line voltage b. line current*
c. torque d. power
732. Direct-on-line starter can be used for small capacity _____ induction motors.
- a. squirrel cage. b. wound rotor.
c. squirrel cage and wound rotor both types of*
733. For starting a small induction motor DOL starter is used in place of iron clad triple-pole (ICTP) switch as it
- a. provides protection against over-load and under-volt.*
b. reduces the starting current.
c. increases the starting torque.
d. improves the power factor and efficiency.
734. Induction motors, when directly switched on across their normal rated supply voltage, the torque developed at starting is about _____ of their full load torque.
- a. half b. 1.5 to 2.5 times*
c. 5 times d. 10 times
735. Under which of the following starting methods, an induction motor draws largest starting current ?
- a. Star-delta starting.
b. Auto-transformer starting.
c. Direct-on-line starting.*
d. Reduced voltage starting.
736. _____ starter is used for starting a 3-phase induction motor that needs frequent starting and operating in forward and reverse directions.
- a. Direct-on-line* b. Star-delta
c. Auto-transformer d. Reduced voltage
737. When a 3-phase induction motor is connected directly across the supply mains, the starting torque in terms of full-load current I_f , short-circuit current I_{sc} , full load torque T_f and full load slip S_f is given as
- a. $T_f \left(\frac{I_{sc}}{I_f} \right) S_f$ b. $T_f \left(\frac{I_{sc}}{I_f} \right)^2 S_f$ *
c. $T_f \left(\frac{I_{sc}}{I_f} \right) S_f^2$ d. $T_f \left(\frac{I_{sc}}{I_f} \right)^2 S_f^2$
738. With DOL start of an induction motor the heating during acceleration of inertia load is proportional to
- a. slip at maximum torque.
b. maximum torque.
c. stored kinetic energy.
- d. electro-magnetic power developed on the rotor.*
739. Primary series resistors are employed in the stator for starting a 3-phase squirrel cage induction motor to
- a. increase the starting torque.
b. improve the pf and efficiency of the motor.
c. reduce voltage applied across the motor terminals.*
d. increase the motor speed.
740. For starting 3-phase squirrel cage induction motors reactors are preferred over resistors as the reactors
- a. incur less power loss and effectively reduce the applied voltage to the motor.*
b. increase the starting torque.
c. improve the power factor at start.
d. all of the above.
741. If the applied voltage across a 3-phase induction motor is reduced to x times, the starting current and starting torque will be reduced to _____ and _____ times respectively.
- a. x,x b. x, x²*
c. x²,x d. x²,x²
742. In auto-transformer starting of a 3-phase induction motor, if the tapping used is x then the starting line current and starting torque will be _____ and _____ times respectively with direct-on-line starting.
- a. x,x b. x, x²
c. x², x²* d. x², x
743. A starting torque of 80 Nm is developed in an induction motor by an auto-transformer starter with a tapping of 30%. If the tapping of auto-transformer is 60%, then the starting torque will be
- a. 40Nm b. 160Nm
c. 240Nm d. 320Nm*
744. A small 3-phase induction motor has a short-circuit 5 times of full-load current and full load slip of 5%. If an auto-transformer with 60% tapping is used for starting this motor, the starting torque will be _____% of full torque.
- a. 45* b. 75
c. 9 d. 22.5
745. In star-delta starting, a 3-phase induction motor
- a. starts with delta connections and runs on star-connections.
b. starts with star-connections and runs on delta-connections.*
c. remains throughout star-connected.
d. remain through out delta connected.
746. Star-delta starting is equivalent to auto-transformer starting with _____ tapping.
- a. 33.3% b. 50%
c. 57.7%* d. 83%
747. Star-delta starting of a 3-phase induction motor reduces

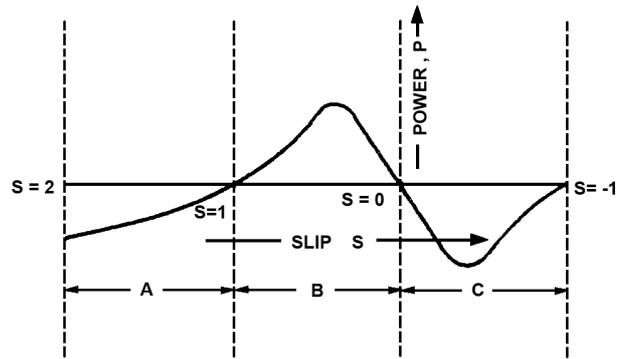
- the starting line current and starting torque to _____ percent and _____ percent respectively of those will DOL starting.
- a. 33.3, 33.3* b. 57.7, 33.3
c. 57.7, 57.7 d. 33.3, 57.7
748. _____ starting method of a 3-phase induction motor needs six terminals.
- a. DOL b. Star-delta*
c. Auto-transformer d. Line resistance
749. The disadvantage of star-delta starting of a 3-phase induction motor is that
- a. during starting power losses are increased.
b. the starting torque increases and the motor runs with jerks.
c. the starting torque is one-third of that in case of delta connections.*
d. at the time of change-over from star to delta connections a voltage peak is produced that may cause damage to that insulation.
750. Which of the following starting methods cannot be used for starting star-connected as delta-connected 3-phase induction motor ?
- a. Direct-on-line b. Star-delta*
c. Auto-transformer d. Line resistance.
e. Rotor-resistance
751. The starting torque of 3-phase slip-ring induction motor can be increased by connecting an external resistance in the
- a. rotor circuit* b. stator circuit
c. supply circuit d. both a. & b.
752. For slip-ring induction motors, rotor resistance starting is preferred over reduced voltage starting because it
- a. limits the speed.
b. limits the starting current.
c. increase the starting torque.
d. improves the starting power factor.
e. limits starting current, increases starting torque and also improves starting power factor.*
753. Which of the following starting methods can not be used for starting a 3-phase squirrel cage induction motor ?
- a. Star-delta b. Auto-transformer
c. Rotor-resistance* d. Line resistance
e. Direct-on-line
754. In case of 3-phase slip-ring induction motor, as the rotor resistance is increased, the starting torque
- a. increases
b. decreases
c. increases upto a certain value of resistance and then remains constant.
d. increases upto a certain value of resistance and then decreases*
755. The stator of a 3-phase, 4-pole slip-ring induction motor is connected to a 50 Hz supply and the rotor is connected to a 20 Hz supply. The rotor speed, at which steady-state motion action will result in is
- a. 600 rpm b. 1,500 rpm
c. 900 rpm d. 2,100
e. either 900 rpm or 2100 rpm*
756. An induction motor can run at synchronous speed if it is operated
- a. on no-load.
b. on full load.*
c. with emf injected in the rotor circuit.
d. on voltage higher than the rated voltage.
757. The speed regulation of a 3-phase induction motor at full load is about
- a. 4%* b. 8%
c. 15% d. 25%
758. The speed of an induction motor depends on
- a. number of stator poles.
b. stator supply frequency.
c. input voltage to stator.
d. all of the above.*
759. Speed of a squirrel cage induction motor can be controlled from
- a. rotor side only.
b. stator side only.*
c. stator as well as rotor side.
d. none of the above.
760. The speed of a slip-ring induction motor can be controlled from
- a. stator side only
b. rotor side only
c. stator as well as rotor side*
d. none of the above.
761. Smooth speed control can be achieved by
- a. rotor resistance control only.
b. rotor slip power control only.
c. variation of supply frequency only.
d. both rotor slip power control and variation of supply frequency.*
762. The absolute speed of magnetic field in space of a 3-phase rotor fed induction motor is
- a. synchronous speed N_s
b. rotor speed N_r
c. $(N_s - N_r)$ *
d. $(N_s + N_r)$
763. In $\frac{V}{f}$ speed control of 3 phase induction motor, with increase in frequency, the maximum torque and slip at which maximum torque occurs, would respectively
- a. increase and decrease *
b. increase and increase
c. decrease and increase
d. decrease and decrease

764. Synchronous speed of an induction motor can be increased by
- reducing mechanical friction.
 - increase supply voltage
 - increasing number of poles.
 - increasing supply frequency.*
765. Supply frequency control is generally affected with _____ constant.
- V/f^*
 - Vf
 - supply voltage V
 - none of these
766. In a variable speed induction motor drive $\frac{V}{f}$ is kept constant over a wide range of its frequency variation. The motor operates in the following mode:
- constant power mode.
 - constant torque mode.*
 - variable power and variable torque mode.
 - constant slip mode.
767. In ac motor control $\frac{V}{f}$ is kept constant to
- make maximum use of the magnetic circuit.*
 - make minimum use of the magnetic circuit.
 - maximize the current drawn.
 - make the power constant.
768. While operating on variable frequency supplies, the ac motor requires variable voltage as well in order to
- protect the insulation.
 - avoid the effect of saturation.*
 - improve the capabilities of the inverter.
 - protect the thyristor from $\frac{dv}{dt}$.
769. Line voltage control is used only with small squirrel cage motors driving fans and blowers as
- it reduces pull-out torque.
 - the range of speed control is limited.
 - both a. and b.*
 - none of these.
770. The method that can be used conveniently for speed control of a squirrel cage induction motor is
- pole changing control.*
 - rotor resistance control.
 - cascade operation.
 - secondary foreign voltage control.
771. The speed of a slip-ring induction motor can not be controlled by
- rotor resistance control.
 - pole changing method.*
 - concatenation or cascade operation.
 - rotor slip power control.
772. Consequent pole technique employed for speed control of induction motors involves changing of the
- slip
 - supply frequency
 - number of poles*
 - any of these.
773. For the applications requiring speed ratio other than 2 : 1, the speed control can be affected by varying the number of stator poles employing
- multiple stator winding.
 - pole amplitude modulation technique.*
 - consequent pole technique.
 - any of the above.
774. The speed of a squirrel cage induction motor cannot be controlled by _____ method.
- pole changing.
 - frequency control.
 - rotor resistance control*
 - line voltage control
775. Rotor resistance speed control used for 3-phase slip-ring induction motors has the drawbacks of
- reduced starting torque.
 - lower efficiency and poor speed regulation.*
 - both a. and b.
 - none of these.
776. In rotor resistance control method _____ with the increase in speed.
- torque increases
 - torque decreases*
 - slip increases
 - losses increase
777. Consider the following statements regarding speed control of induction motors by means of external rotor resistors:
- Regulation in speed is accompanied by reduced efficiency.
 - With a large resistance in the rotor circuit, the speed would vary considerably with variation in torque.
 - The method is very complicated.
- The disadvantage of such a method of speed control would include
- 1 and 2*
 - 2 and 3
 - 1 and 3
 - 1, 2, 3
778. In rotor resistance control of induction motor, the hardness of speed torque characteristics
- increases
 - decrease.*
 - remains same
779. The method that gives continuous speed control of a slip-ring induction motor is
- rotor resistance control.
 - secondary foreign voltage control.*
 - concatenation or cascade operation.
 - line voltage control.
780. In case of voltage injection method of speed control, the injection emf should be of
- supply frequency (f)
 - slip frequency (sf)*
 - $(1 - s)f$
 - $(2 - s)f$

781. Speeds higher than synchronous speed can be had by
- line voltage control.
 - rotor slip power control.*
 - rotor resistance control.
 - frequency control.
782. Slip-changing method of speed control can be used in case of
- slip-ring induction motors only.*
 - squirrel cage induction motors only.
 - squirrel cage as well as slip-ring induction motors.
 - none of the above.
783. Cascade method of speed control involves the use of two coupled induction motors. The necessary condition for speed control is that
- both the motors are of the wound rotor type having the same number of poles.
 - both the motors are of the squirrel cage rotor type having different number of poles.
 - one motor is of the slip-ring type but both the motors have the same number of poles.
 - one motor is of the slip-ring type and the two motors have different number of poles.*
784. In the cumulative cascade connection of two 3-phase induction motors, the synchronous speed of the set is given as
- $\frac{120f}{P_1}$
 - $\frac{120f}{P_2}$
 - $\frac{120f}{(P_1 + P_2)}$ *
 - $\frac{120f}{(P_1 - P_2)}$
785. In cascade operation of two induction motors, the ratio of mechanical power developed and the electrical power in the rotor of the main induction motor having P_1 number of stator poles will be
- $\frac{P_1}{P_2}$ *
 - $\frac{P_2}{P_1}$
 - $\frac{P_1 + P_2}{P_2}$
 - $\frac{P_1 - P_2}{P_2}$
786. At sub-synchronous speeds, in Kramer system, the electrical power fed to the auxiliary commutator machine at the slip frequency is
- dissipated as heat.
 - converted into mechanical power and supplied to the driven shaft.*
 - converted into electrical energy at line frequency and returned back to the supply mains.
 - none of the above.
787. At sub-synchronous speed, in Scherbius system, the electrical power supplied to the auxiliary commutator machine at the slip frequency is
- dissipated as heat.
 - converted into mechanical power and supplied to the driven shaft.
 - converted into electrical energy at line frequency and returned back to the supply mains.*
 - none of the above.
788. A 3-phase squirrel cage induction motor has a full-load efficiency of 0.8 and a maximum efficiency of 0.9. It is operated at a slip of 0.6 by applying a reduced voltage. The efficiency of the motor at this operating point is
- less than 0.4*
 - greater than 0.6
 - in the range of 0.8 ± 0.1
 - none of the above.
789. In plugging with a 3-phase induction motor.
- any two stator terminals are earthed.
 - any two stator terminals are shorted together.
 - the stator terminals are connected to a dc source.
 - the supply terminals of any two stator phases are interchanged.*
790. In dynamic braking of 3-phase induction motors.
- the supply terminals of any two stator phases are interchanged.
 - any two stator terminals of any two stator phases are interchanged.
 - the stator terminals are switched over to a dc source from the ac supply.*
 - a dc voltage is injected in the rotor circuit.
791. _____ braking is employed where reversal of direction of rotation is required.
- Dynamic
 - Plugging*
 - Regenerative
 - Any of these.
792. It is preferable to employ _____ braking for controlling the speed of motor during deceleration.
- regenerative
 - plugging
 - dc dynamic*
 - mechanical
793. While braking a 3-phase induction motor, its terminals were switched-over to a dc source from ac supply. The method of braking is
- regenerative braking.
 - counter-current braking.
 - eddy current braking.
 - none of the above.*
794. In a 3-phase induction motor, the regenerative braking occur when
- the load is lowered by a hoisting machine.*
 - the load is raised by a hoisting machine.
 - the number of poles is reduced in a pole-changing motor.
 - the motor speed falls due to overload.
795. The stator of a 2/4 pole changing cage motor is initially wound for 2-poles. The reconnection of the stator winding to 4-poles through a change over switch, while the motor is running would result in
- constant torque drive.

- b. constant he drive.
 c. plugging to standstill.
 d. regenerative braking to half the original speed.*
796. If a squirrel cage induction motor runs slow, the probable cause could be
 a. low voltage. b. over-load
 c. shorted stator coils d. one phase open
 e. open stator coils f. any of these*
797. If a squirrel cage induction motor run hot, the probable cause could be
 a. uneven air gap b. over-load
 c. low supply frequency. d. any of these*
798. If an induction motor hums during starting up, the possible cause could be
 a. open-circuit.
 b. unequal phase resistance.
 c. inter-turn short-circuit on rotor.
 d. any of the above.*
799. Under normal operating conditions, motor bearings may be safely operated at temperature up to
 a. 45°C b. 75°C
 c. 95°C * d. 125°C
800. A 3-phase induction motor fails to start. It may be due to
 a. over-loading.
 b. wrong connections.
 c. open-circuit in stator or rotor winding.
 d. any of the above.*
801. Three phase induction motor should preferably be mounted on
 a. wooden structure
 b. solid concrete foundation.
 c. rigid steel structure.
 d. either b) or c)*
802. The large sized induction motors are protected against over-load by
 a. high-voltage fuses.
 b. automatic cutouts.
 c. thermal of magnetic relays.*
 d. rewirable fuses.
803. The insulating materials employed for motor windings are classified according to
 a. motor kw output rating.
 b. level of temperature rise.*
 c. controller size.
 d. over-load protection available.
804. The factor(s) to be considered in selection of motor is/ are
 a. voltage rating of the motor.
 b. kw output rating of the motor.
 c. speed and frame enclosure size.
 d. bearings and protection provided.
- e. all of the above.*
805. One slip-ring connection of a 3-phase induction motor gets open-circuited. The motor will
 a. continue to run at the same speed.
 b. run at a lower speed.*
 c. run at a higher speed.
 d. stop.
806. A 3-phase wound rotor induction motor, when started with load connected to its shaft, was found to start but settle down at about half synchronous speed. If the rotor winding as well as stator winding were star-connected, the cause of the malfunctioning could be attributed to
 a. one of the stator phase winding being short-circuited.
 b. one of the supply fuses being blown.
 c. one of the rotor phase being open-circuited.*
 d. two of the rotor phases being open-circuited.
807. Insulation resistance of a motor is checked with a megger and the reading is recorded when the motor
 a. is first installed.*
 b. operates on over-load.
 c. breaks down.
 d. operates on no load.
808. Insulation resistance is measured between
 a. inter-turns of stator winding.
 b. inter-turns of rotor winding.
 c. windings and motor frame.*
 d. rotor and stator.
809. The minimum value of insulation resistance permissible for an induction motor is
 a. 0.5 MW/kv b. 1.0 MW/kv*
 c. 2.5 MW/kv d. 5.0 MW/kv
810. The minimum value of insulation resistance for an induction motor is prescribed at a temperature of
 a. 40°C b. 60°C
 c. 75°C * d. 105°C
811. Armature short-circuits can be detected and identified by _____ test(s).
 a. growler b. bar-to-bar
 c. voltage drop d. any of these *
812. Electrical noise cannot be heard with
 a. power on b. power off *
 c. rotor locked d. defective bearings.
813. In which of the following aspects induction generator does not differ from a synchronous generator ?
 a. It does not need dc excitation.
 b. Its stator is different in construction from that of a synchronous generator.*
 c. No synchronising is required.
 d. The frequency generated is independent of its speed.

814. Induction generators deliver power at
- leading power factor only.*
 - lagging power factor only.
 - leading as well as lagging power factor.
 - unity power factor only.
815. In a self excited induction generator, to keep the frequency of generated voltage constant with the increase in load, the speed of the induction machine should be
- increased*
 - decreased
 - maintained less than the rated synchronous speed.
 - maintained more than the rated synchronous speed.
816. A 3-phase induction motor runs at super synchronous speed. For self excitation the machine
- draws real power from the mains.
 - draws reactive power from the mains.*
 - feeds reactive power to the mains.
 - generators emf at the expense of residual magnetism.
817. Consider the following statements; if a 3-phase squirrel cage induction machine operates at a slip of - 0.05 (i.e. minus 0.05), then the machine will
- draw electrical power from the mains.
 - draw mechanical power through the shaft.
 - deliver electrical power to the mains.
- Of these statements
- 1, 2 and 3 are correct.
 - 1 and 2 are correct.
 - 2 and 3 are correct.*
 - 1 and 3 are correct.
818. Which of the following is not the advantage of an induction generator ?
- It does not hunt or drop out of synchronism.
 - It is simple and rugged in construction, cheaper in cost and needs little maintenance.
 - It delivers only leading current.*
 - When short-circuited it delivers little or no sustained power.
819. Which of the following is not the disadvantage of an induction generator ?
- It cannot be operated independently.
 - When short-circuited it delivers little or no sustained power.
 - It can deliver only leading current.*
 - none of the above.
820. An 8-pole wound rotor induction motor operating at 60 Hz supply is driven at 1,800 rpm by a prime mover in the opposite direction of the revolving field. The rotor current frequency is
- 60 Hz
 - 120 Hz
 - 180 Hz*
 - none of the above
821. The power-slip characteristics of a 3-phase induction machine, shown in the figure, has three regions of operations



- A- Braking region
- B- Motor region
- C- Generator region

Which of these are correctly represented in the given figure ?

- A and B
 - B and C*
 - A and C
 - A, B and C
822. In a 3-phase induction machine, motoring, generating and braking operations take place in the range of slip "s" given by
- motoring: $1 > S > 0$; generating : $0 > S > -1$; braking: $S > 1$ *
 - motoring : $S > 1$; generating $1 > S > 0$; braking: $0 > S > -1$
 - motoring : $S > 1$; generating $0 > S > -1$ braking: $0 > S > 0$.
 - motoring : $0 > S > -1$; generating : $S > 1$; braking: $1 > S > 0$.
823. Which of the following statements about synchronous-induction motor is incorrect ?
- It is basically a wound rotor induction motor with fewer and larger slots on rotor.
 - It has a very small air-gap as expected in a plain induction motor.*
 - It is connected to 3-phase ac supply on stator side and to dc on rotor side.
 - It starts as an induction motor and runs as a synchronous motor.
 - It is provided with a heavy rotor winding.
824. The synchronous impedance of a synchronous-induction motor is much larger than that of a synchronous motor due to
- its larger air-gap.
 - presence of damper bars in it.
 - its less magnetic reluctance.*
 - supply of dc excitation to its 3-phase rotor.
825. Synchronous-induction motors
- are used where high starting torque is required.
 - can be operated on full load on any desired pf.
 - are very often installed alongwith other induction motors in order to improve the overall power factor of the system.
 - have been made for rating up to 30,000 kw.
 - all of the above statements regarding synchronous induction motors are correct.*

826. The secondary of a linear induction motor normally consist of a
- concentrated single phase winding.
 - distributed single phase winding.
 - solid conducting plate.*
 - distributed three phase winding.
827. Linear induction motor is used in
- traction*
 - magnetic attraction
 - mechanical workshops
 - textile mills
828. A Schrage motor is a variable speed commutator type three phase induction motor and has three windings,
- all the three winding located in stator
 - all the three winding located in rotor.
 - two windings in rotor and one winding in stator.*
 - two winding in stator and one winding on rotor.
829. The primary winding of a Schrage motor is located
- in stator.
 - in lower part of the rotor.*
 - in upper part of the rotor.
 - partly in stator and partly in rotor.
830. For starting a Schrage motor, 3-phase supply is connected to
- rotor via slip-rings.*
 - secondary winding via brushes.
 - regulating windings.
 - stator windings as in an ordinary induction motor.
831. Which of the following motors is used only where adjustable speed is required over a wide range ?
- Schrage motor.*
 - Synchronous motor.
 - Slip-ring induction motor.
 - Squirrel-cage induction motor.
832. Which of the following statements about Schrage motor is incorrect ?
- it gives normally speed range of 3 to 1 but much speed range upto 15 to 1 and higher may also be obtained.
 - It is cheaper than the slip-ring induction motor.*
 - Its efficiency is higher than that of a slip-ring induction motor at all speeds except synchronous speed and is very much high at lower speeds.
 - while operating exactly at synchronous speeds it behaves, in a sense, like a synchronous motor compensating winding functioning as a dc exciter.
833. Which of the following statements associated with a Schrage motor is/are correct ?
- The magnitude into the slip frequency voltage injected into the secondary circuit depends upon the spacing between the two sets of brushes, and the phase depends on their angular position with respect on their angular position with respect to centre of the rotor winding.
 - When the two seats of brushes of each phase are making contact with the same commutator bar, the secondary is short-circuited and the motor operates an ordinary induction motor.
 - Its power factor can be varied by rocking the brushes as a whole round the commutator.
 - all of the above.*
834. A 3-phase slip-ring induction motor is fed from the rotor side with stator winding short-circuited. The frequency of the currents in the short-circuited stator is
- slip frequency.*
 - supply frequency.
 - frequency corresponding to rotor speed.
 - zero.
835. A 3-phase induction motor is fed from a balanced 3-phase supply on the rotor side, short-circuiting the stator terminals. The speed of the rotating magnetic field is
- zero.
 - equal to rotor speed.
 - equal to synchronous speed.
 - equal to slip speed.*
836. In particular motor there is a stator phase winding and a short-circuited rotor winding. The motor runs as synchronous speed but does not necessitate any dc excitation. The motor is a
- 3-phase induction motor.
 - 3-phase synchronous motor.
 - 3-phase reluctance motor.*
 - hysteresis motor.
837. The motor that requires the most complicated arrangement for speed control is
- dc shunt motor.
 - squirrel cage induction motor.*
 - stator supplied 3-phase commutator motor.
 - rotor supplied 3-phase commutator motor.
838. When the stators of two slip-ring induction motors are fed from a common 3-phase ac supply in parallel and the rotor windings are connected in opposition, they are called
- power selsyns*
 - position selsyns
 - power synchros
 - position synchros
839. Position synchronous normally have _____ phase stator winding and _____ phase rotor winding.
- three, single*
 - single, three
 - three, three
 - single, single

840. Phase advancers are employed with large induction motors to
- regulate their speeds.
 - reduce copper losses.
 - improve power factor.*
 - reduce noise and vibrations.
841. Which of the following statement about a phase advancer is incorrect ?
- It is a particular type of ac exciter which may be connected in the rotor circuit of an induction motor to improve power factor.
 - It uses the principle of injection through slip-rings of the motor a current leading with regard to the rotor voltage.
 - It resembles with an induction motor in construction.*
 - Its kva capacity needs be only 5% or less of kva correction affected in the main supply circuit.
 - It has compensating windings on the stator to ensure good commutation.
842. A fractional horse power or a small motor is defined as a motor built in a frame smaller than having a continuous rating of
- | | |
|-----------|-----------|
| a. 1/4 hp | b. 1/2 hp |
| c. 1 hp* | d. 2 hp |
843. Single phase ac motors are used in largest number. This is due to
- their great variety of useful services in the home, office, the factory, in business establishment and on the farm.
 - their wide applications in automatic control devices of various types.
 - lower cost.
 - both (a) and (b).*
844. A dual voltage single phase ac motors can be operated on either
- | | |
|------------------|-----------------|
| a. 230 or 400 V | b. 30 or 400 V |
| c. 115 or 230 V* | d. 160 or 320 V |
845. Single phase ac motors are classified on the basis of
- | | |
|-----------------|---------------------|
| a. construction | b. starting methods |
| c. size | d. rpm |
- e. both construction and starting methods.*
846. In a single phase ac induction motor
- stator is supplied with single phase ac.
 - rotor is supplied with single phase ac.
 - rotor is cage rotor.
 - rotor is wound rotor.
 - both (a) and (c).*
847. The rotor slots in an induction motor are, usually not kept parallel to the shaft as it
- helps the rotor, teeth to remain under the stator teeth.
 - helps in reducing the tendency of the rotor teeth to remain under the stator teeth.*
 - improves pf.
 - improves efficiency.
848. Most of the fractional horse power motors are fitted with _____ bearings.
- | | |
|----------|-----------|
| a. plain | b. sleeve |
| c. ball | d. roller |
- e. plain or sleeve*
849. A single phase induction motor is
- self starting.
 - not self starting.
 - self starting with the help of an auxiliary winding.*
 - none of the above.
850. Double revolving field theory is based on the idea that pulsating field produced in single phase motors can be resolved into two components of _____ its amplitude and rotating in _____ direction with synchronous speed.
- | |
|--------------------------------------|
| a. half, same |
| b. half, opposite* |
| c. $\frac{\sqrt{2}}$ times of, same |
| d. $\frac{\sqrt{2}}$ times, opposite |
851. In a double revolving field theory of single phase induction motor, the slip of the forward motor is then the slip of the back ward motor is
- | | |
|-----------|----------|
| a. 2 s | b. s |
| c. 2 - s* | d. s - 2 |
852. In a comparative study of the torque-slip characteristics of a balanced polyphase induction motor and that of a single phase induction motor, it is found that for zero slip
- the torque for the former is zero and has a non-zero negative value for the latter.*
 - the torque has a non-zero positive value on the former and has a non-zero negative value on the latter.
 - the torque is zero on both of the characteristics.
 - the torque has non-zero positive value on both of the characteristics.
853. A rotating magnetic field is produced by current in two winding displaced by 90 electrical degrees. This is the principle of
- | | |
|-------------------|---------------------|
| a. phase sequence | b. phase splitting* |
| c. phase timing | d. none of these. |
854. In an induction motor
- stator current, stator flux and rotor emf are in phase.
 - Rotor current and rotor flux are in phase and both lag behind the rotor emf by 90°.
 - Rotor current, rotor flux and rotor emf are in phase.
 - both (a) and (b) are correct.*

855. Field created by rotor currents is at right angle to the field created by stator currents and is so called the cross-field. The cross-field is _____ stator field at actually operating speeds.
- somewhat weaker than.*
 - somewhat stronger than.
 - of the same strength as that of .
 - any of the above.
856. In comparison to three phase induction motors, single phase induction motors have
- lower efficiency.
 - lower pf
 - poor speed regulation
 - more slip at full load
 - all of the above*
857. The torque developed by a single phase induction rotor drops to zero at
- synchronous speed
 - a speed slightly above synchronous speed
 - a speed slightly below synchronous speed.*
 - none of the above
858. Performance characteristics of single phase induction motors are _____ that of three phase induction motors.
- as satisfactory as
 - less satisfactory than*
 - more satisfactory than
 - almost as satisfactory as
859. The no-load current of a single phase induction motor is around _____ % of full load current.
- 10
 - 20
 - 40*
 - 80
860. The power factor at which single phase induction motors usually operate is
- 0.7 lag*
 - 0.8 lag
 - 0.7 lead
 - unity
861. Which of the following test are performed on single phase ac motors ?
- Stator winding resistance test.
 - Blocked rotor test.
 - No-load test.
 - All of the above.*
862. A 125 W, 4 pole, 110 V, 50 Hz, single phase induction motor delivers rated output at a slip of 6 per cent. The total copper losses at full load and rotational losses each are 25 W. The copper losses caused by forward field and backward field are respectively
- 0.75 W and 24.25 W.
 - 10 W and 15 W.*
 - 15 W and 10W.
 - 12.5 W each.
863. Single phase induction motors are made self starting by
- increasing rotor resistance.
 - using an external starting device.
 - providing an additional winding on the stator called the auxiliary winding.*
 - any of the above methods.
864. The two winding provided on the stator of a single phase induction motor, one main winding and the other auxiliary winding are connected
- in parallel*
 - in series
 - either in series or in parallel depending on the design of the motor
 - through inductive coupling
865. The stator winding of a single phase induction motor is spitted into two parts in order to
- improve efficiency.
 - improve power factor.
 - develop starting torque.*
 - increase speed.
866. In a single phase induction motor
- both the main and auxiliary windings are placed on stator.*
 - both the main and auxiliary windings are placed on rotor.
 - main winding is placed on stator and auxiliary winding on rotor.
 - auxiliary winding is placed on stator and main winding on rotor.
867. When a single phase induction motor picks up predetermined speed, its starting winding is disconnected and the motor continues running on _____ winding.
- rotor
 - armature
 - main*
 - compensating
868. Phase splitting can be accomplished in a single phase induction motor
- only by adding a capacitor in series with the auxiliary winding.
 - only by causing the auxiliary winding to have high reactance.
 - only by causing the auxiliary winding to have low resistance.
 - by any one of the above three methods.*
869. In a split phase motor the ratio of number of turns on auxiliary winding to that on main winding is
- unity
 - less than one*
 - more than one
 - two
870. Which of the following statements associated with split phase motors is incorrect ?
- Auxiliary winding is wound of the wire and is placed in the top of the slots to give high resistance and low reactance.
 - Main winding has low resistance and high reactance.

887. Compared to a resistor split phase motor a capacitor start motor has
 a. high starting torque.* b. lower starting torque.
 c. higher running torque. d. lower running torque.
888. In comparison to a resistance start motor, the capacitor start motor has
 a. high starting torque (about double).*
 b. low starting current (about half).
 c. high running torque
 d. larger phase difference between two winding currents.
 e. more number of turns on auxiliary winding.
 f. all of the above statements except (c) are correct.
889. A capacitor start induction motor is switched on to supply with its capacitor replaced by an induction of equivalent reactance. The motor will
 a. not start at all.*
 b. start and run slowly.
 c. start and run at rated speed.
 d. start with humming noise.
890. If the capacitor of a capacitor start induction motor is short-circuited, the motor will
 a. start
 b. not start*
 c. burn
 d. start with jerks
891. If the capacitor of a capacitor start induction motor fails to open when it picks up the speed,
 a. the motor will stop.
 b. the auxiliary winding will get damaged.
 c. the capacitor will get damaged.*
 d. the main winding will get damaged.
892. Capacitor-start capacitor-run induction motor is basically a _____ motor.
 a. two phase*
 b. ac series
 c. commutator
 d. synchronous
893. In a capacitor-start capacitor-run induction motor
 a. oil impregnated paper of small value and continuous rating is connected in series with the main winding.
 b. larger value electrolytic short duty capacitor is connected in series with auxiliary winding through a centrifugal switch.
 c. low value oil impregnated paper capacitor is connected in series with the auxiliary winding through a centrifugal switch.
 d. both (a) and (b).*
894. In a capacitor-start capacitor-run single phase induction motor, the value of capacitor connected in series with starting winding is approximately - times that of capacitor in the main or running winding.
 a. 1/3
 b. 3*
 c. 1/2
 d. twice
895. In a capacitor-start , capacitor-run induction motor, the split phase angle can be adjusted to be nearly 90° by choosing the proper.
 a. number of turns on the auxiliary winding.
 b. value of capacitor for the auxiliary winding.
 c. value of capacitor for the main winding.*
 d. any of the above.
896. The direction of rotation of a two capacitor type induction motor can be reversed by reversing the connections to the supply of
 a. main winding only.
 b. auxiliary winding only.
 c. either (a) or (b). *
 d. both (a) and (b) simultaneously.
897. As compared to capacitor start motors two capacitor type induction motors have
 a. better power factor and better efficiency.
 b. constant torque and so quite operation.
 c. greater overload capacity.
 d. high starting torque.
 e. all of the above.*
898. Two capacitor type induction motors have the main draw-back of
 a. high cost.*
 b. low power factor.
 c. pulsating torque.
 d. poor starting torque.
899. Two capacitor type single phase induction motor is generally coupled with the air conditioner because it
 a. is cheaper.
 b. is quite in operation.
 c. has higher running torque.
 d. has low starting as well as running currents.*
900. In a ceiling fan employing permanent capacitor motor
 a. secondary winding surrounds the primary winding.*
 b. primary winding surrounds the secondary winding.
 c. both are usual arrangements.
 d. none of the above.
901. In comparison to resistance start induction motor the permanent capacitor motor
 a. is more expensive.
 b. has better power factor
 c. has better starting torque
 d. all of the above.*
902. In comparison to resistance start induction motor the permanent capacitor motor
 a. simple construction and low cost.
 b. poor power factor.
 c. poor starting torque.
 d. all of the above.*
903. Which of the following statements regarding permanent capacitor motor is false ?
 a. It does not have a centrifugal switch.
 b. It does not have a starting winding and a squirrel

- cage rotor.*
- c. Its auxiliary winding is designed for continuous rating.
- d. It is more sensitive to voltage variations due to its poor running torque.
904. In a shaded pole motor the phase splitting is achieved by placing a shading coil at the slot cut around the
- large part of the pole.
 - smaller part of the pole.*
 - both the parts of the pole.
 - any of the above.
905. In a shaded pole motor, the rotating field is developed by using
- salient poles.
 - a capacitor.
 - shading coils.*
 - dampener winding.
906. Shaded pole motor is provided with
- laminated salient poles and a squirrel cage rotor.*
 - a commutator.
 - a capacitor.
 - a centrifugal switch.
907. In a shaded-pole motor, shading coils are used to
- reduce winding losses.
 - reduce friction losses.
 - produce rotating magnetic field.*
 - protect against sparking.
908. In a shaded pole squirrel cage induction motor the flux in the shaded part always
- leads the flux in the unshaded pole segment.
 - is in phase with the flux in the unshaded pole segment.
 - lags the flux in the unshaded pole segment.*
 - none of the above.
909. Which of the following statements associated with shaded pole induction motor is incorrect ?
- It is one of the simplest and cheapest single phase induction motor.
 - It has squirrel cage type rotor.
 - It has high operating efficiency.*
 - It has laminated salient poles each provided with its own exciting coil.
 - It is built in very small ratings (say upto 40W).
910. Shaded pole induction motor does not have the advantage of
- high starting torque.*
 - rugged construction.
 - low initial as well as maintenance costs.
 - comparatively small starting current.
 - use of concentrated winding and absence of centrifugal switch.
911. Consider the following statement regarding fractional horse power shaded pole motor;
- Its direction of rotation is from unshaded to shaded portion of the poles.
 - Its direction of rotation is from shaded to unshaded portion of the poles.
 - It can remain stalled for short periods without any harm.
 - It has a very poor power factor.
- Of these statements
- 1, 3 and 4 are correct.*
 - 2, 3 and 4 are correct.
 - 2 and 4 are correct.
 - 1 and 3 are correct.
912. The direction of shaded pole motor can be reversed by
- reversing supply terminals.
 - shifting any shading coil to the other half of the pole.
 - shifting two shading coils to the other half of the pole.
 - shifting all the shading coils to the other half of the pole.*
913. Shaded pole induction motor does not have the drawback of
- very small starting torque and poor power factor.
 - high cost.*
 - very low efficiency (5 to 35%)
 - very little over-load capacity
 - non-uniform operating torque.
914. In a shaded pole induction motor, locked rotor current is _____ full load current.
- less than
 - equal to
 - slightly more than*
 - several times the
915. The direction of rotation of a shaded pole induction motor
- cannot be reversed unless there is a provision for shifting of shading coil from one half to the other half of the pole.*
 - can be reversed by interchanging main winding terminals.
 - can be reversed by interchanging the supply terminals.
 - can be reversed by open-circuiting the shading rings.
916. The speed of single phase induction motors can be controlled by
- varying the applied voltage to the stator winding.
 - varying the number of poles on the stator.
 - either (a) or (b).*
 - none of these.
917. The wattage rating for a ceiling motor will be in the
- 50 to 250 W
 - 250 to 500 W
 - 50 to 150 W*
 - 10 to 20 W
918. A dc shunt motor does not operate on ac due to

- a. low resistance of armature circuit.
 b. high resistance of field circuit.
 c. high inductance of field circuit.*
 d. reversal of polarity.
919. If a dc series motor is operated on ac supply, it
 a. will not start at all.
 b. will start and run but will have poor performance such as excessive sparking, poor efficiency and poor power factor.*
 c. will get damaged due to burning of its windings.
 d. will run at excessively high speed.
920. The operation of an ordinary dc series motor when operated on ac, would not be satisfactory. The reason (s) is/are
 a. excessive eddy-current losses in the field core and yoke due to alternation in field flux.
 b. heavy sparking due to induced voltage and currents in the armature coils short-circuited by the brushes while undergoing commutation.
 c. abnormal voltage drop and low power factor due to inductance of the field winding.
 d. non-uniform torque due to reversal of field and armature current every half cycle.
 e. all of the above.*
921. What will happen if a single phase supply is connected to an ordinary dc series motor ?
 a. not run, at all
 b. run, but not satisfactorily.*
 c. armature burnt out.
 d. field winding burnt out
922. AC series motors are built with as few field turns as possible to reduce
 a. flux
 b. eddy current losses.
 c. reactance *
 d. speed
923. AC series motors in comparison to dc series motors do not have
 a. all parts of magnetic circuits laminated.
 b. multi-turn armature coils.
 c. very short air gap.
 d. single turn armature coils.*
924. In a large sized ac series motor, the inductive effects of armature and field cause
 a. serious commutation difficulties.
 b. heavy iron losses.
 c. low power factor.
 d. all of the above.*
925. Which of the following statement associated with an ac series motor is/are incorrect ?
 a. Its speed falls with the increase in load torque.
 b. Its power factor decreases with the increase in load torque.
 c. its torque-speed characteristics is similar to that of a dc shunt motor.*
- d. Its torque-speed characteristics is similar to that of a dc series motor.
926. In an ac series motor
 a. the starting current is about 2.5 times of full load current.
 b. the starting torque is about 4 times of full load torque.
 c. power factor varies from 0.9 to 0.95 lagging.
 d. all of the above.*
927. In an series motor, compensation winding is provided to
 a. neutralize the armature mmf.
 b. improve commutation and reduce sparking at the brushes.
 c. reduce reactance drop.
 d. reduce armature heating and vibration.
 e. all of the above except (d).*
928. AC series motors are preferably operated on low voltage and low frequency because
 a. low operating voltage reduces the inductance.
 b. lower operating frequency reduces reactance and iron loss and improves commutation.
 c. both (a) and (b).*
 d. none of the these.
929. In a large sized as series motor, armature reaction effect is neutralized and sparkless commutation is achieved by
 a. providing a compensating winding.*
 b. increasing supply winding.
 c. increasing supply voltage.
 d. connecting a high resistance in series with the winding.
930. In an ac series motor, power factor is improved by
 a. increasing the inductance of armature and field windings.
 b. reducing the inductance of armature and field windings.*
 c. increasing the supply.
 d. both (a) and (c).
931. In an ac series motor, commutation is improved by
 a. reducing the number of armature conductors.
 b. providing commutating poles.
 c. providing commutating poles and shunting winding of each of these poles with a non-inductive resistance.*
 d. increasing field winding turns.
932. In ac series motors armature coils are usually connected to commutator
 a. through resistors.* b. through inductors.
 c. through capacitors. d. solidly.
933. For improvement of commutation in ac series motors shunted commutating poles are commonly used and commutating pole windings are shunted

- by a
- non-inductive resistor to make the commutating pole current to lead the main current.
 - non-inductive resistor to make the commutating pole current to lag behind the main current.*
 - reactor to make the commutating pole current to lag behind the main current.
 - given statements are false.
934. A universal motor is one which has
- constant speed.
 - constant output.
 - capability of operating both on ac and dc with comparable performance*
 - maximum efficiency.
935. Which of the following statements associated with universal motor is incorrect ?
- It is a series connected commutator motor.
 - It is a constant speed motor.*
 - Its armature is of some construction as ordinary series motor.
 - Like all series motors, its no-load speed is very high.
 - It is usually built into the device it drives.
936. Which of the following statements about universal motor is incorrect ?
- it has laminated stator and laminated yoke.
 - it is built in small sizes upto about 0.5 kw.
 - its load-speed characteristic is very much similar to that of a dc series motor.
 - when operated on dc or ac supply at same speed it develops different outputs.*
 - It is designed for commercial frequencies ranging from zero to 50 Hz.
937. A universal motors runs at
- higher speed with dc supply and with less sparking.*
 - higher speed with ac supply and with less sparking.
 - same speed with both ac and dc supplies.
 - higher speed with ac supply but with increased sparking at the brushes.
938. Speed of the universal motor is
- dependent on frequency of supply.
 - proportional to frequency of supply.
 - independent of frequency of supply.*
 - none of the above.
939. Direction of rotation of a universal motor can be reversed by
- interchanging the brush leads.*
 - interchanging the supply terminals.
 - either (a) or (b).
 - none of these.
940. The speed of a universal motor is usually reduced by using
- V-belts
 - gearing*
 - chains
 - brakes
941. The speed of a universal motor is not controlled by
- connecting rheostat in series.
 - varying flux with tapped field windings.
 - varying supply frequency.*
 - applying variable supply voltage.
942. The speed of a universal motor can be controlled by
- introducing a variable resistance in series with the motor.
 - tapping the field at various points.*
 - centrifugal mechanism.
 - all of the above steps.
943. In a universal motor the most common causes(s) of brush sparking is/are
- open armature winding.
 - shorted armature winding.
 - shorted field winding.
 - high commutator mica.
 - all of the above.*
944. Under no load operating condition, the speed of a universal motor is limited by
- windage and friction.*
 - armature reaction.
 - armature weight.
 - supply frequency.
945. The armature reaction in a large sized universal motor is neutralized by
- shifting the brushes.
 - connecting a compensating winding in series with the armature.*
 - increasing the number of armature coils.
 - using low resistance brushes.
946. In case of a high speed universal motor _____ needs maximum attention.
- air gap
 - end play
 - balanced of rotor*
 - Insulation of rotor
947. In universal motors, normally the ratio of width of brushes to the width of commutator segment is
- 2 : 1*
 - 1 : 1
 - 1 : 2
 - 4 : 1
948. Repulsion motor
- receives its armature current by induction.
 - is similar to a series motor except that rotor and stator windings are inductively coupled.
 - can be directly switched on to supply line.
 - has high starting torque and high speed on no load.
 - all of the above.*
949. A repulsion motor is equipped with
- slip-rings.
 - centrifugal switch.
 - commutators and brushes.*
 - all of the above.

950. In a repulsion motor
- stator usually carries a distributed winding similar to the main winding of an ordinary single phase induction motor.
 - the rotor or armature is similar to a dc motor armature with a drum type winding connected to the commutator.
 - the brushes fixed directly opposite to each other are connected to each other or short-circuited.
 - the speed is function of load.
 - all of the above.*
951. Which of the following statements associated with repulsion motor is wrong ?
- Its direction of rotation depends upon the position of brushes.
 - Its characteristics are similar to those of series motor.
 - Its power factor is high.*
 - It is used where sturdy motor with large starting torque and adjustable but constant speed is required.
952. In a repulsion motor, commutator provides a means of connecting the
- stator windings.
 - armature windings.*
 - starting winding.
 - none of these.
953. In a repulsion motor the brushes are connected
- to the external supply.
 - to each other or short-circuited.*
 - to the stator winding.
 - none of the above.
954. Cross-connecting of commutator bars in repulsion motors reduces circulating currents caused due to
- unequal air-gap between the stator and rotor.*
 - shorted stator winding.
 - shorted brushes.
 - all of these.
955. In repulsion motors, brush angle with respect to magnetic axis is kept
- 0° to 150°
 - 15° to 45° *.
 - 90°
 - 180°
956. The torque-speed characteristics of a repulsion motor resembles which of the following dc motor characteristic ?
- Separately excited.
 - Shunt
 - Series*
 - Compound.
957. In a single-phase repulsion motor power factor is
- always leading
 - high at low speed.
 - high at high speed.*
 - always unity.
958. In a repulsion motor by shifting the brush position
- speed and direction of rotation can be controlled.
 - only speed can be controlled.
 - speed, torque and direction of rotation can be controlled.*
 - only torque can be controlled by varying the speed at constant output power.
959. In a repulsion motor, torque developed will be zero when brush axis is at _____ electrical degrees to the field axis.
- 0
 - 90
 - 45
 - both a & b*
960. In a repulsion motor speed control is affected by varying the
- impressed voltage.
 - position of brushes.
 - supply frequency.
 - either a or b*
961. Direction of rotation of a repulsion motor is reversed by
- interchanging the supply leads.
 - shifting the brushes round the commutator.*
 - either a or b
 - none of these
962. In a compensated repulsion motor, an additional stator winding is provided in order to
- improve power factor.
 - provide better speed regulation.
 - increase the output.
 - improve mechanical balance.
 - both a and b*
963. A repulsion start induction motor all of the commutator segments are short-circuited by
- commutator segments are short-circuited.*
 - brushes are short-circuited.
 - stator is short-circuited.
 - short-circuiting device is disconnected.
964. In q repulsion start induction motor all of the commutator segment are short-circuited by
- the brushes.
 - equilizer connections.
 - short-circuiting devices.*
 - any of the above.
965. The short-circuiting device in a repulsion start induction motor operates by
- magnetic attraction.
 - centrifugal force.*
 - circulating currents.
 - none of the above.
966. The repulsion start induction motor has the advantage(s) of
- high starting torque (2.5 to 4.5 times of full-load torque)
 - low starting current (about 3.5 times of full-load current).
 - low cost, high efficiency and good power factor.
 - both (a) and (b).*
967. Which of the following statement regarding repulsion start induction motor is/are correct ?
- it runs below synchronous speeds on all loads.
 - it needs more maintenance of commutator and other

- mechanical devices.
- It makes quite a noise on starting.
 - it starts as a repulsion motor with its brushes set to give maximum torque.
 - all of the above.*
968. Repulsion induction motor has
- single phase winding on its stator.
 - two separate windings on its rotor in common slots.
 - squirrel cage rotor and two separate winding on stator in common slots.
 - both (a) and (b).*
969. In a repulsion induction motor, the rotor has a
- squirrel cage winding with rotor bars permanently short-circuited and placed at the bottom of the slots.
 - repulsion winding similar to dc armature winding placed over the squirrel cage winding.
 - repulsion winding placed at the bottom of slots and squirrel cage winding placed above the repulsion winding.
 - both a and b.*
970. Which of the following statements regarding repulsion induction motor is wrong ?
- At start squirrel cage winding does not produce any torque.
 - At start and at low speeds, major part of the torque is developed by repulsion winding.
 - At rated load it almost runs at synchronous speed.
 - it employes centrifugally operated mechanism for short-circuiting the commutator.*
971. The repulsion induction motor has
- fairly good speed regulation.
 - starting torque 2.25 to 3 times the full torque.
 - starting current 3 to 4 times the full-load current.
 - all of the above.*
972. The repulsion induction motor does not have the drawbacks of
- higher cost.
 - careful maintenance.
 - poor starting torque.*
 - tendency of sparking.
973. Single phase synchronous motors
- are self starting motors.
 - do not need dc motors.
 - operate at constant speed.
 - are built for a wider range of output.
 - all of the above.*
974. Which of the following motors is not a synchronous motor ?
- Hysteresis.
 - Repulsion.*
 - Inductor.
 - Reluctance.
975. Single phase induction motor built with a variable air gap and without dc excitation is called the _____ motor.
- reluctance*
 - hysteresis
- repulsion
 - split phase
976. A single phase reluctance motor
- has salient pole rotor structure and runs at sub-synchronous speed.
 - has salient pole rotor structure and runs at super-synchronous speed.
 - has salient pole rotor structure and runs at synchronous speed.*
 - has non-salient pole rotor structure and runs at synchronous speed.
977. Reluctance torque is the
- torque developed in a given synchronous motor as a function of field excitation and the sine of the torque angle.
 - torque developed by salient pole synchronous or synchronous induction motors due to variations in air gap produced by armature reaction.*
 - torque developed by non-salient pole asynchronous motor.
 - torque developed by none of the above.
978. Reluctance motor is a _____ motor.
- singly excited*
 - double excited
 - unexcited
 - either a or b
979. Reluctance motor
- is a self starting motor
 - runs at constant speed.
 - needs no dc excitation for its rotor.
 - starts as an induction motor and runs as a synchronous motor.
 - all of the above.*
980. In a reluctance motor, when the load increases to an extent that it cannot maintain synchronous speed, it will
- fall out of synchronism and come to rest.
 - run as an induction motor.*
 - draw excessive armature current and burn out.
 - become unstable.
981. Which of the following statements about reluctance start motor is/are correct ?
- It is basically an induction motor and not a synchronous motor.
 - The air-gap between rotor and stator is uniform.
 - Its working principle is similar as that of a shaded pole motor.
 - Both a and c.*
982. Hysteresis motor is a
- synchronous induction motor.
 - single phase induction motor.
 - single phase synchronous motor without any salient pole and without dc excitation.*
 - single phase synchronous motor with salient poles and without dc excitation.

983. Hysteresis motor operates on the principle of
 a. hysteresis loss.*
 b. eddy current loss.
 c. electro-magnetic induction.
 d. magnetization of rotor.
984. The rotor of a hysteresis motor is built up of
 a. cast iron sheet.
 b. a group of specially hardened steel rings.*
 c. thin silicon steel laminations.
 d. thin m-metal laminations.
985. In an hysteresis motor, the rotor core must have
 a. retentivity* b. susceptibility
 c. resistivity d. none of these
986. A hysteresis motor
 a. is a self starting motor.
 b. is a constant speed motor.
 c. does not need dc excitation.
 d. all of the above.*
987. In a single phase hysteresis motor
 a. starting torque is caused by both eddy current and hysteresis while the running torque is caused by hysteresis.*
 b. starting as well as running torques are caused by both eddy current and hysteresis.
 c. starting torque is caused by only eddy current while running torque is caused by only hysteresis.
988. A hysteresis motor
 a. has high starting torque due to its high rotor hysteresis loss.
 b. is extremely quiet in operation due to absence of teeth and winding on rotor.
 c. accelerates from rest to full speed almost instantaneously.
 d. all of the above.*
989. The main reason for using a hysteresis motor for high quality tape recorders and record players is that
 a. its speed is constant (synchronous).
 b. it develops extremely steady torque.*
 c. it requires no centrifugal switch.
 d. its operation is not affected by mechanical vibrations.
990. A fluctuating voltage supply is detrimental to a refrigerator motor but not to a ceiling fan, although both are single phase induction motors because, the refrigerator motor
 a. is made more robust than the fan motor.
 b. is subjected to short duty cycle but the fan motor is subjected to continuous duty.
 c. is enclosed in a sealed unit while the fan motor is open to the environment.
 d. load is constant, but the fan motor load is voltage dependent.*
991. If a single phase motor fails to start but gives humming noise, this may be due to
 a. low voltage
 b. high voltage
 c. shorted stator winding.*
 d. blown fuses.
992. If a single phase motor fails to start, it may be due to
 a. blown fuses.
 b. open-circuit in auxiliary winding.
 c. open-circuit in main winding.
 d. short-circuit in the winding.*
993. An electric motor gets over-heated. This may be due to
 a. over-loading.
 b. shorted stator winding.
 c. worn-out or dry bearings.
 d. low or high voltage.
 e. any of the above.*
994. If the centrifugal switch fails to open when the motor attains 70 to 80 percent of asynchronous speed, it would result in
 a. over-loading of main winding.
 b. damage of centrifugal switch.
 c. damage to the starting winding.*
 d. none of the above.
995. If the starting winding of a single phase induction motor is left in the circuit
 a. the motor will run faster.
 b. the motor will run slower.
 c. there will be undue sparking.
 d. the auxiliary winding will get over-heated due to continuous flow of current and may get damaged.*
996. The running winding of a single phase motor is found earthed on test. The most probable location of ground faults is at the
 a. end connection.
 b. end terminals.
 c. slot edge where coils enter or come out of the slot.*
 d. anywhere on the winding inside or come out of the slot.
997. Burning out of windings is due to
 a. open-circuited capacitor.
 b. short-circuited capacitor.*
 c. capacitor of improper rating.
 d. none of the above.
998. An open in the centrifugal switch circuit gives an indication of
 a. open winding.* b. shorted winding.
 c. grounded winding. d. none of these.
999. Starting or auxiliary winding of single phase motor used in a refrigerator is disconnected from the circuit by
 a. centrifugal switch.

- b. magnetic relay.*
 c. thermal relay.
 d. any of the above.
1000. Consider the following single-phase motors
 I Capacitor start motor
 II Capacitor start and run motor
 III Permanent split capacitor motor
 IV Shaded pole motor
 The correct sequence of the increasing order of their cost is
 a. IV, III, II, I b. IV, III, I, II*
 c. III, IV, II, I d. III, IV, I, II
1001. Which of the following motors are used in largest number ?
 a. Fractional horse power motors.*
 b. 3-phase induction motors.
 c. DC shunt motors.
 d. Synchronous motors.
1002. Which of the following types of motors are not single phase ac motors ?
 a. Induction type motors.
 b. Commutator type motors.
 c. Synchronous type motors.
 d. Schrage motors.*
1003. Which of the following is not the induction motor ?
 a. Squirrel cage* b. Slip-ring
 c. Reluctance d. Double cage
1004. Which of the following types of motors are not the induction motors ?
 a. Repulsion motors.*
 b. Split phase motors.
 c. Shaded pole motors.
 d. Repulsion start induction motors.
1005. Which of the following types of motors are not the commutator motors ?
 a. AC series motors.
 b. Reluctance motors.*
 c. Universal motors.
 d. Repulsion motors.
 e. Repulsion-induction motors.
1006. Which of the following types of ac motors are synchronous type ?
 a. Reluctance motors.
 b. Hysteresis motors.
 c. Universal motors.
 d. both a) and b)*
1007. Which of the following motors has squirrel cage winding on stator ?
 a. 3-phase squirrel cage induction motor.
 b. 1-phase squirrel cage induction motor.
 c. 1-phase ceiling fan induction motor.*
 d. 1-phase table fan induction motor.
1008. Which of the following motors does not use a centrifugal switch ?
 a. Shaded pole motor.*
 b. Split phase motor.
 c. capacitor-start capacitor run motor.
 d. Repulsion start induction motor.
1009. Which single phase induction motor has the lowest speed ?
 a. Shaded pole.* b. Universal.
 c. Hysteresis. d. Repulsion.
1010. For speed higher than say 3000 rpm, the machine used is
 a. induction motor. b. synchronous motor.
 c. universal motor.* d. none of the above.
1011. Which of the following motors used a centrifugal switch ?
 a. Permanent capacitor motor.
 b. Reluctance motor.*
 c. Hysteresis motor.
 d. Universal motor.
1012. The stator and rotor pole number may be different in a
 a. pole changing induction motor.
 b. reluctance motor.*
 c. repulsion motor.
 d. synchronous motor.
1013. Which of the following motors is relatively free from mechanical and magnetic vibrations and give least noise ?
 a. Shaded pole motor. b. Universal motor.
 c. Hysteresis motor.* d. Reluctance motor.
1014. Which of the following motor is preferred for tape recorder ?
 a. Shaded pole motor.
 b. Hysteresis motor.*
 c. Tow-value capacitor motor.
 d. Universal motor.
1015. AC servo-motor is basically a
 a. Universal motor.
 b. capacitor motor.
 c. 2-phase induction motor.*
 d. 3-phase induction motor.
1016. Two stator winding of ac servo-motors are oriented electrical degrees apart.
 a. 90* b. 60
 c. 120 d. 180
1017. An ac servomotor (2-phase induction motor) has a rotor with
 a. high resistance winding.
 b. very small diameter to reduce inertia.
 c. very small diameter to reduce inertia.
 d. both a and b.*
 e. both a and c.

1018. The drag cup rotor is employed in a two phase induction motor to give
- low inertia*
 - high inertia
 - low torque
 - high torque
1019. AC servo-motor has the draw back of
- commutation problem.
 - low starting torque.*
 - poor reliability.
 - all of these.
1020. Given that D = rotor diameter and L = axial length, a high performance a c servo-motor is characterized by
- large D, large L
 - large D, small L
 - small D, small L
 - small D, large L*
1021. Which of the following statements is not true for an ac servo-motor ?
- Has low inertia rotor.
 - Is a single phase motor.*
 - Has slip torque characteristics as straight line with negative slope.
 - Reference voltage frequency is high compared to signal frequency.
1022. For stability of an ac servo-motor
- a negative slope on the torque speed curve is necessary.*
 - linearized torque-speed curve is essential.
 - the ratio of the rotor reactance to rotor resistance should be high.
1023. If a conventional motor is used for servo-applications, the system becomes unstable due to
- large diameter of rotor.
 - small axial length of rotor.
 - low resistance of rotor.*
 - high resistance of rotor.
1024. While a 2-phase ac servo-motor is in operation, if the voltage across the control field winding becomes zero, then the motor has a tendency to run as a single phase induction motor. To prevent this
- rotor having high mass moment of inertia is used for such a motor.
 - drag cup type of light rotor high resistance is preferred.*
 - a low resistance is used.
 - the number of turns in the control field winding used is less than the main reference winding.
1025. A stepper motor is a device.
- hydraulic
 - pneumatic
 - electro-mechanical*
1026. The input to a stepper motors is in the form of
- frictional force.
 - electric pulses.*
 - mechanical inertia
 - viscous damping force.
1027. The output of a stepper motor is in the form of
- linear movements
 - angular movements.
- c. either a or b.* d. none of these.
1028. Which type of motor is most suitable for a computer printer drive ?
- Reluctance motor.
 - Hysteresis motor
 - Shaded pole motor
 - Stepper motor*
1029. Which of the following machines is most widely used for conversion of ac into dc ?
- Motor-generator set.
 - Motor convertor.
 - Rectifier.*
 - Rotary convertor.
1030. _____ is normally used for conversion of ac into dc on large scale.
- Mercury arc rectifier.*
 - Motor convertor
 - Rotary convertor
 - Motor generator set
1031. _____ motor is usually employed in motor-generator sets.
- Squirrel cage induction
 - Slip-ring induction
 - Synchronous*
 - Commutator
1032. Motor-generator set does not suffer from the draw back of
- difficulty in control of output voltage.*
 - high cost.
 - poor efficiency.
 - requirement of more space.
1033. The rotor of motor-convertor is wound for
- single phase.
 - 3 phase.
 - 6 phase.
 - 12 phase.
 - 9 or 12 phase.*
1034. The number of poles on rotor of a motor convertor is _____ the number poles on its stator.
- equal to
 - more than
 - less than
 - independent of*
1035. The speed of the motor-convertor having number of poles on motor and generator sides P_m and P_g respectively and supplied from ac supply of frequency f is given as
- $\frac{120f}{P_m}$
 - $\frac{120f}{P_g}$
 - $\frac{120f}{P_m + P_g}$ *
 - $\frac{120f}{P_m - P_g}$
1036. In a motor-convertor, induction machine acts as
- a motor only
 - a convertor only.
 - a transformer only.
 - both as motor and as transformer.*
1037. In a motor-convertor the commutator machine acts as
- a generator only.
 - a convertor only.

- c. both as motor and as transformer.*
d. as a transformer only.
1038. In a motor-converter, the energy converted into mechanical energy to drive the shaft is given as _____ x energy input to the set.
- a. $\frac{P_g}{P_m + P_g}$ b. $\frac{P_m}{P_m + P_g}$ *
c. $\frac{P_m}{P_m - P_g}$ d. $\frac{P_g}{P_m - P_g}$
1039. The motor-converter does not suffer from the drawback of
- a. lower speed.
b. commutation problem.*
c. higher cost.
d. none of these.
1040. Rotary converter
- a. is not a machine.
b. is one machine only.*
c. has two machines-one synchronous motor and other dc generator.
d. has two machine-one induction motor and other dc generator.
1041. A rotary converter in general construction and design, is more or less like
- a. any dc machine* b. a transformer
c. an alternator d. an induction motor
1042. A rotary converter combines the functions of
- a. an induction motor and dc shunt generator.
b. an induction motor and a dc series generator.
c. a synchronous motor and a dc series generator.
d. a synchronous motor and a dc shunt or compound generator.*
1043. In a rotary converter armature currents are
- a. dc only b. ac only
c. partly ac and partly dc*
1044. In a rotary converter, ac and dc armature powers will be equal only when _____ losses are negligible and power factor is _____ .
- a. electrical; 1
b. mechanical; 1
c. electrical and mechanical; 1*
d. electrical and mechanical; 0.5
1045. Which of the following statement regarding ratios of line voltages and line currents on the ac side to that on the dc side of a synchronous converter is true ?
- a. Both line voltage ratio as well as line current ratio decrease with the increase in number of phases.*
b. Both line voltage ratio as well as line current ratio increase with the increase in number of phases.
c. Line voltage ratio increases but current ratio decreases with the increase in number of phases.
d. Line voltage ratio decrease but current ratio increases with the increase in number of phases.
1046. In a synchronous converter, copper losses are _____ that of a dc generator of the same size.
- a. equal to b. more than
c. less than* d. double of
1047. In a rotary converter, the copper losses are less in comparison to those of a dc generator of the same size. This is due to
- a. neutralization of dc component by ac component.*
b. negligible dc currents.
c. low operating speed.
d. all of the above.
1048. In a rotary converter copper loss are maximum at
- a. tapping points.*
b. midway between the tapping points.
c. every where equal.
d. all of the above.
1049. Which one of the following statements regarding the position of minimum copper loss in a phase of rotary converter is true ?
- a. The position of minimum copper loss is in the middle of the phase whatever may be the power factor.
b. The position of minimum copper loss varies with the variation in power factor and this position is displaced from the middle of the phase by the power factor angle.*
c. The position of minimum copper loss is the tapping point whatever may be the power factor.
d. None of the above.
1050. Which one of the following statement regarding a rotary converter is WRONG ?
- a. The output of a synchronous converter is generally larger than the output of the same machine operating as a dc generator.
b. The relative output increase with the increase in number of phases.
c. It operates on low power factor.*
d. The relative output diminishes as the power factor drops.
e. The temperature rise of a synchronous converter is less, in general, than the temperature rise of the same machine as a dc generator.
1051. The magnitude of each of the voltage phasors represented by the sides of a regular hexagon in a 6-phase system produced by double star connection of the secondaries of transformers is _____ times the voltage of each secondary winding.
- a. 0.5 b. 1.0*
c. 0.866 d. $\sqrt{3}$
1052. The magnitude of each of the voltage phasors represented by the sides of a regular hexagon in 6-

1069. The ionization potential of mercury is about
 a. 10.4 V* b. 5.4 V
 c. 24 V d. 2.4 V
1070. Glass bulb mercury arc rectifiers are made in rating upto
 a. 100 A at 100 V b. 200 A at 200 V
 c. 500 A at 500 V* d. 1000 A at 500 V.
1071. The average life of the glass bulb mercury arc rectifier is of the order of
 a. 1,20,000 hours* b. 12,000 hours
 c. 1,200 hours d. 4,800 hours
1072. If in a mercury arc rectifier connections of anode and cathode are interchanged
 a. the rectifier will get damaged.
 b. the rectifier will operate at reduced output.
 c. the rectifier will not operate.*
 d. none of the above.
1073. In comparison to mercury arc rectifiers metal rectifiers
 a. operate on low temperatures.*
 b. can operate on high voltages.
 c. can operate on high loads.
 d. give poor voltage regulation.
1074. The metal rectifiers are preferred over tube rectifiers as
 a. they are mechanically stronger.
 b. they do not need any voltage for filament heating.
 c. both a and b.*
 d. none of these.
1075. Lesser the number of anodes in mercury arc rectifier
 a. more smoother will be the output.
 b. less smoother will be the output.*
 c. output smoothness will have no effect.
 d. none of the above.
1076. Reactor is introduced in the ignition circuit of a mercury arc rectifier to limit
 a. wave ripples b. circuit voltage
 c. circuit current* d. none of these
1077. A set of resonant shunts is connected across the output terminals of a multi-anode mercury arc rectifier in order to
 a. reduce harmonic effect.*
 b. reduce noise level.
 c. reduce internal losses.
 d. improve the supply power factor.
1078. Ripple frequency in a single phase full wave rectifier operating at 50 Hz frequency supply is
 a. 25 b. 50
 c. 100* d. 200
1079. _____ phase mercury arc rectifier will deliver least undulating current.
 a. Single b. Two
 c. Three d. Six*
1080. The voltage drop at cathode in a mercury arc rectifier is due to
 a. surface resistance.
 b. expenditure of energy in ionization.
 c. expenditure of energy in liberating electrons from the cathode and in evaporating the mercury.*
 d. expenditure of energy in overcoming the electrostatic field around the anode.
1081. The voltage drop at anode in a mercury arc rectifier is due to
 a. energy expended in overcoming the electrostatic field in the neighbourhood of the anode.*
 b. expenditure of energy in ionization.
 c. self restoring property of mercury.
 d. all of the above.
1082. The voltage drop in arc primary depends on
 a. arc temperature b. arc length*
 c. purity of mercury d. all of the above.
1083. _____ depends upon loading in a mercury arc rectifier.
 a. Anode drop
 b. Cathode drop
 c. Drop in arc itself*
 d. Both anode and cathode drops
1084. The internal efficiency of a mercury arc rectifier depends on
 a. current only
 b. voltage only*
 c. both current and voltage
 d. none of the above.
1085. In a 3-phase bridge rectifier fed from a starconnected secondary winding of a transformer, let the voltage to the neutral of the A-phase (phase sequence A,B,C) be $V_m \sin \omega t$. At the instant when the voltage of A-phase is maximum, the output voltage at the rectifier terminals will be
 a. $\frac{V_m}{\sqrt{2}}$ b. V_m *
 c. $1.5 V_m$ d. $\sqrt{3} V_m$
1086. For an n-pulse rectifier, the rms value of the ac current is related to the dc load current as
 a. $I_{rms} = \frac{I_d}{n}$ b. $I_{rms} = \frac{I_d}{\sqrt{n}}$ *
 c. $I_{rms} = I_d$ d. $I_{rms} = \frac{2}{\pi} I_d$
1087. In a polyphase mercury arc rectifier the utility factor is given as
 a. $\frac{\sqrt{2} m \sqrt{m}}{\pi} \sin \frac{\pi}{m}$ b. $\frac{\sqrt{2} m}{\pi} \sin \frac{\pi}{m}$
 c. $\frac{\sqrt{2} m}{\pi} \sin \frac{\pi}{m}$ * d. $\frac{2}{\pi} \sin \frac{\pi}{m}$
1088. Utility factor is maximum for _____ phase rectifier.

Codes :	A	B	C	D
a.	1	2	3	4
b.	2	1	3	4
c.	1	2	4	3
d.	2	1	4	3*

Codes :	A	B	C
a.	1	2	3
b.	2	3	1
c.	3	1	2*
d.	1	3	2

1100. List I (Connection of 3-phase transformers)
 A Delta-zig zag
 B Star-zig zag
 C Open delta
- List II (Utilization factor)
 1. 0.5
 2. 0.667
 3. 0.866
 4. 1.0

Codes :	A	B	C
a.	3	3	3*
b.	1	2	3
c.	2	3	1
d.	2	2	2

1101. List I (Faults)
 A Internal fault (minor or major)
 B External fault
 C High voltage Surges
- List II (Protective device used)
 1. HRC fuses.
 2. Arcing horns.
 3. Buchholz relay.
 4. Breather.

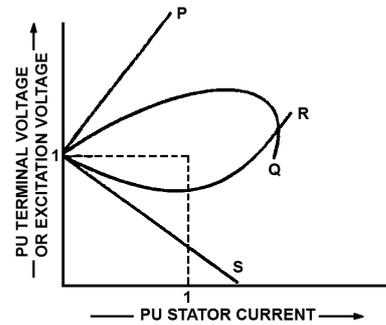
Codes :	A	B	C
a.	3	4	2
b.	3	1	2*
c.	4	1	2
d.	3	1	4

1102. List I (Parts of turbo-generator used in thermal power plants)
 A Stator core
 B Rotor core
 C Stator windings
 D Slip-rings
- List II (Materials from which these parts are made)
 1 Copper
 2 Copper alloy
 3 Silicon steel
 4 Mild steel
 5 Aluminium

Codes :	A	B	C	D
a.	3	5	2	1
b.	4	5	1	2
c.	4	3	1	2*
d.	3	4	1	2

1103. List I (Power factor of load)
 A Zero lag
 B Unity
 C Zero lead
- List II (Armature reaction effect in a synchronous alternator)
 1 Distortional or cross-magnetizing.
 2 Magnetizing
 3 Demagnetizing

1104. Fig given below depicts the load characteristics of an isolated three phase alternator running at constant speed. Match the following sets of operating conditions with the given characteristics. Disregard the effects of saliency, saturation and stator resistance.



- A Constant excitation and non-zero leading power factor.
 B Constant excitation and zero power factor, leading.
 C Constant terminal voltage and zero power factor leading.
 D Constant terminal voltage and non-zero leading power factor.

Codes:	A	B	C	D
a.	P	Q	S	R
b.	Q	P	S	R
c.	Q	P	S	R*
d.	P	S	R	Q

1105. List I (Name of machine)
 A Synchronous motor
 B Synchronous
 C Synchronous reactor
 D Synchronous phase modifier
- List II (Main characteristic)
 1. Operates from lagging to leading power factor without mechanical load
 2. Operates over a condenser wide range of power factors from lagging to leading and supplies mechanical load also.
 3. Operates at leading pf only without mechanical load.
 4. Operates at lagging pf only with mechanical load.

Codes:	A	B	C	D
a.	2	3	4	1
b.	3	2	4	1
c.	2	3	1	4
d.	2	3	1	1 *

1106. The per unit voltage of two synchronous machines connected through a lossless line are $0.95 \angle 10^\circ$ and $1.0 \angle 0^\circ$, match the two sides in the following:

Side 1	Side 2
A Real power of machine 1	P Positive real power
B Reactive power of machine 1	Q Positive reactive power
C Power factor of machine	R Negative real power
	S Negative reactive power
	T Leading power factor
	L Lagging power factor

Codes:	A	B	C
a.	P	Q	T*
b.	R	Q	T
c.	P	S	U
d.	R	S	U

1107. List I (Parts of electrical machine) List II (Approximate nature of airgap mmf produced in them)

A DC machine stator	1. Sinusoidal
B DC machine rotor	2. Trapezoidal
C Salient pole synchronous machine stator	3. Triangular
D Squirrel cage rotor of induction motor	

Codes:	A	B	C	D
a.	1	2	1	3
b.	3	1	3	1
c.	2	3	1	3
d.	2	3	1	1*

1108. List I (Test) List II (Machine)

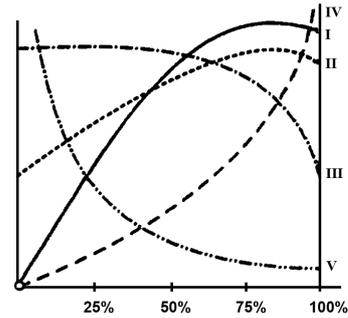
A No-load and blocked rotor test	P Transformer
B Sumpner's test	Q Induction machine
C Swinburn's test	R Synchronous machine
	S DC machine

Codes:	A	B	C
a.	Q	P	S*
b.	P	Q	S
c.	Q	S	P

d. S P Q

1109. Out of the several characteristics shown in fig given below identify ones to match the following for a 3-phase induction motor.

List I	List II
x-axis	P curve I
A Load efficiency	Q curve II
B Speed current	R curve III
C Speed power factor	S curve IV
	T curve V



Codes:	A	B	C
a.	R	R	P
b.	P	R	Q*
c.	P	Q	T
d.	Q	P	S

1110. A 3-phase induction motor is loaded. Match the consequent changes indicated in list II with the parameters indicated in list I

List I	List II
A Power factor	1. Increase
B Slip	2. Decrease
C Effective rotor reactance	

Codes:	A	B	C	D
a.	1	1	1	2
b.	1	1	1	-*
c.	2	2	2	1
d.	-	1	1	-

1111. List I (Type of induction motors) List II (Class of motors)

A Low-impedance squirrel cage induction motors	1. Class C motors
B High reactance squirrel cage induction motors	2. Class D motors
C High starting torque low starting current double cage motors.	3. Class B motors
D High resistance squirrel cage induction motors.	4. Class E motors
	5. Class A motors.

Codes:	A	B	C	D
a.	1	2	3	4
b.	5	3	1	2*
c.	2	3	5	4
d.	5	3	2	1

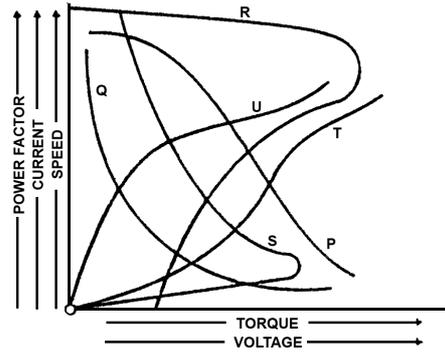
1112. List I
(Types of induction motors)
- A Low starting torque normal starting current and normal motors.
 B Low starting torque, low starting current and normal slip induction motors.
 C High resistance squirrel cage induction motors.
- List II
(Class of motor)
1. Class A motors
 2. Class B motors
 3. Class D motors
 4. Class E motors.
 5. Class F motors.

Codes:	A	B	C
a.	1	2	3
b.	2	3	4
c.	4	5	3*
d.	3	4	5

1113. List I
(Size of 3-phase induction motor)
- A Small
 B Medium (25 HP)
 C Large with heavy rotor.
- List II
(Bearing used)
1. Journal bearing.
 2. Bush bearing.
 3. Ball bearing.
 4. Roller bearing.

Codes:	A	B	C
a.	3	4	1*
b.	2	4	1
c.	3	2	1
d.	3	4	2

1114. List I
(Motor characteristics)
- A Speed-torque characteristics of induction machine under motoring operation
 B Current-torque characteristics of a dc series motor
 C Power factor variation with voltage of an induction motor under no-load operation.
 D Speed-torque characteristics of induction machine under dc injection dynamic braking operation.
 E Speed-torque characteristics of a dc series motor.
- List II
(Plot of Characteristics)



Codes:	A	B	C	D	E
a.	R	U	P	S	Q
b.	P	U	T	R	Q*
c.	R	U	T	S	S
d.	U	T	Q	S	P

1115. List I
- A Self excitation of dc generators
 B Speed control of a 3-phase induction motor by varying rotor resistance.
 C Speed control of a dc motor by field weakening.
 D Variation of applied to an induction motor with varying stator frequency.
- List II
1. Efficient and smooth speed control over wide range.
 2. Constant power applications.
 3. Associated with variation of load resistance.
 4. Constant torque application.
 5. Dangerous high speeds at no load

Codes:	A	B	C	D
a.	3	4	5	1
b.	3	4	2	1*
c.	3	2	4	5
d.	4	3	2	5

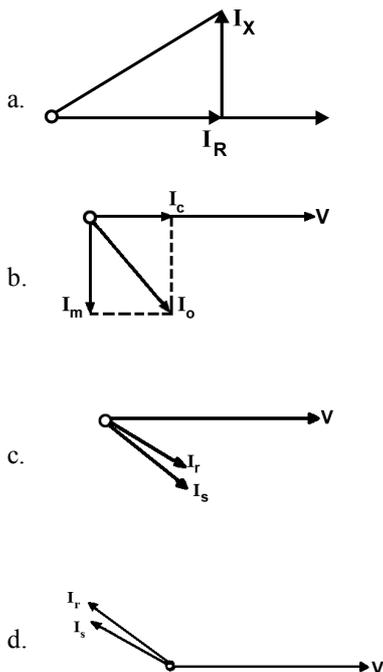
1116. List I
(Methods of control)
- A Injection of voltage into the rotor circuit of a 3 phase induction motor.
 B Variation of applied voltage to a 3 phase induction motor at constant frequency.
 C Series-parallel control of dc series motors.
 D Ward-Leonard control of dc motors.
- List II
(Applications)
1. Steel rolling mills.
 2. Textile mills
 3. Fans and blowers.
 4. Traction
 5. Position control in a servo system.

Codes:	A	B	C	D
a.	1	2	3	4
b.	4	5	2	1
c.	1	5	2	4
d.	2	3	4	1*

1117. List I
- A Synchronous motor input when the excitation is reduced to zero.
 - B Reactance voltage
 - C Tendency of induction motor to run at very low speeds
 - D Deceleration due to speed reversal
 - E Zero power factor method.
- List II
1. Synchronous power
 2. Compensating windings.
 3. Plugging
 4. Reluctance power
 5. Voltage regulation
 6. Commulating poles
 7. Crawling
 8. Regenerative braking
 9. Speed regulation.
 10. Cogging.

Codes:	A	B	C	D	E
a.	4	6	7	3	5*
b.	4	6	3	5	7
c.	1	7	3	8	9
d.	5	2	10	8	6

1118. List I



- List II
1. Full load generating
 2. Blocked rotor

3. Full-load motoring
4. No load

Codes:	A	B	C	D
a.	2	4	1	3
b.	2	3	4	1
c.	2	4	3	1*
d.	4	2	3	1

1119. List I (Name of motor)
- A Capacitor start induction motor
 - B Capacitor-start capacitor-run induction motor.
 - C Permanent capacitor motor
 - D Shaded pole motor
- List II (Characteristics)
1. Inherently self starting but very small starting torque.
 2. Low starting torque.
 3. High starting torque
 4. High starting torque, better power factor and better efficiency

Codes:	A	B	C	D
a.	3	4	2	1*
b.	3	4	1	2
c.	1	3	2	4
d.	4	3	1	2

1120. List I (Name of motor)
- A. Shaded pole motor
 - B Universal motor
 - C Reluctance motor
 - D Hysteresis motor
- List II (Constructional features)
1. Series motor armature type armature.
 2. Salient poles and concentrated winding.
 3. Rotor has neither teeth nor winding.
 4. Rotor of unsymmetrical shape and has no winding.

Codes:	A	B	C	D
a.	2	1	3	4
b.	2	1	4	3*
c.	1	2	4	3
d.	1	2	3	4

1121. List I (Name of motor)
- A Capacitor-start capacitor-run induction motor.
 - B Permanent capacitor motor.
- List II (Characteristics)
1. Low starting torque.
 2. High starting torque

- and high speed (more than 3,000 rpm).
- C Universal motor 3. Better efficiency, better power factor and high starting torque.
- D AC series motor 4. High starting torque and variable speed.

Codes:	A	B	C	D
a.	1	3	4	2
b.	1	3	2	4
c.	3	1	2	4*
d.	3	1	4	2

1122. List I (Name of motor)
- A Repulsion motor
- B Repulsion start induction motor
- C AC series motor
- D Universal motor
- List II (Applications)
1. Electric traction.
2. Coil winders.
3. Vacuum cleaners and portable drills.
4. Refrigerator compressors.

Codes:	A	B	C	D
a.	4	2	3	1
b.	4	2	1	3*
c.	2	4	3	1
d.	2	4	1	3

1123. List I (Motors)
- A Permanent magnet dc motor.
- B Stepper motor
- C Single phase Induction motor
- D Universal motor
- List II (Applications)
1. Cassette tape recorder.
2. Ceiling fan.
3. Hand drill.
4. Digital control.

Codes:	A	B	C	D
a.	1	4	2	3
b.	1	3	2	4
c.	4	1	3	2
d.	1	2	4	3 *

1124. List I (Motors)
- A Shaded pole motor.
- B Universal motor
- C Reluctance motor
- D Hysteresis motor
- List II (Applications)
1. Record players and tape recorders.
2. Electric clocks, signalling and timing devices.
3. Small fans.
4. Electric shavers.

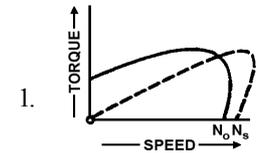
Codes:	A	B	C	D
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- a. 3 4 1 2*
- b. 3 4 2 1
- c. 4 3 1 2
- d. 1 2 4 3

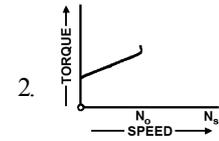
1125. List I (Types of motor)

- List II (Torque-speed characteristics)

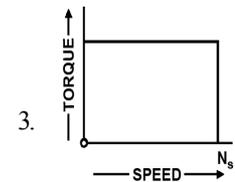
A Hysteresis motor



B Capacitor start split phase motor



C Reluctance motor



Codes:	A	B	C
a.	3	1	2
b.	2	3	1*
c.	2	1	3
d.	1	3	2

1126. List I (Type of 1-f motor)
- A Permanent magnet type
- B Shaded pole
- C Universal
- D Capacitor-start capacitor-run induction motor
- List II (Type of appliance)
1. Rocket
2. Refrigerator compressor
3. Sewing machine
4. Photocopying machine

Codes:	A	B	C	D
a.	1	2	3	4
b.	1	2	4	3
c.	4	1	3	2
d.	1	4	3	2*

TRUE/FALSE

1. An alternator used in power-house has stationary field and rotating armature. **(F)**
2. In a 3-phase synchronous machine, the rotor rotates in the direction opposite to that of the stator field. **(F)**

3. Alternator has no commutator. (T)
4. The alternator driven by an hydraulic turbine is called the turbo-alternator. (F)
5. The rotor of an alternator has two slip-rings for dc supply. (T)
6. Alternator field is desinged to have low inductance. (F)
7. Revolving armature type alternator are usually of relatively small kva capacity and low voltage rating. (T)
8. The pole face in a salient pole type rotor is so shaped that the radial air-gap length increases from the pole centre to pole tips. (T)
9. Totally closed slots are commonly used for housing armature winding in alternators. (F)
10. Cyclindrical rotor synchronous machines have always horizontal configuration. (T)
11. Cylindrical construction of rotor provides better balance and less noisy operation. (T)
12. The salient type pole rotor of a synchronous machine is dicasted. (F)
13. Pelton wheel driven alternators are usually of horizontal configurations. (F)
14. In a large synchronous generator damper winding is provided to improve stability. (T)
15. Synchornous generators driven by IC engines must have large flywheels or heavy damper windings in order to prevent excessive oscillations. (T)
16. In synchronous machines the dmapers are placed in pole core. (F)
17. The stator core laminations of an alternator are annealed and insulated from each other by thin oxide coating and an enamel. (T)
18. In an elternator, a fractional rather than integral number of slots per pole is often used in order to eliminate harmonics in the wave-form. (T)
19. Large power generating stations usually have several exciters using various methods of drive so as to ensure excitation supply. (T)
20. An alternator's capacity to generator electric power is primary limited due to heating within the machine. (T)
21. The single layer winding has one conductor per slot. (T)
22. One turn consists of two-coils sides. (F)
23. For a double layer winidng the number of slots in the stator of a synchronous machine is a multiple of the number of poles and the number of phases. (T)
24. The majority of the ac machines use fractional pitch coils. (T)
25. Short-pitch coils cannot be employed in concentric windings. (T)
26. Chorded coils are never employed in synchronous machine windings. (F)
27. Direction of alternating induced emf in the armature conductors of an alternator can be determined by Flemming's right hand rule. (F)
28. The effect of armature reaction in an alternator is taken care of by magnetizing reactance of the machine. (T)
29. In an alternator mmfs of the stator and rotor are stationary with respect of each other. (T)
30. In case of synchronous generator the armature reaction effect is independent of power factor of the load. (F)
31. Synchronous reactance can be determined from open-circuit and short-circuit tests. (T)
32. In an alternator the terminal voltage is equal to the phasor difference of no-load voltage and product of armature current and synchronous impedance. (T)
33. The rise in voltage of an alternator when the load is thrown off is the same as the fall in voltage when the same load is applied. (F)
34. Percentage impednace is the impedance drop at rated current and frequency expressed as the %age of the rated voltage. (T)
35. Direct load method may be used for determination of voltage regulation for small machines but is not recommended for large machiens. (T)
36. The short-circuit ratio of a synchronous machine is defined as the ratio of the field current required to develop rated voltage on open0circuit to the field current required to give rated current on short-circuit. (T)
37. A small short-circuit ratio indicates small armature reaction in an alternator. (F)
38. When an alternator is operating on no load, the power supplied by the prime-mover is mainly utilized to produce induced emf in the armature winding. (F)
39. Ventilation problem is not much severe in case of cylindrical pole alternators. (F)

40. The provision of radial ventilating ducts in the stampings assists in cooling of a machine. (T)
41. The cooling medium flows axially or longitudinally through the air-gap and the lamination perforations and is discharged radially through the ventilating ducts. (T)
42. Proper oil level should be maintained in case of sleeve bearings. (T)
43. The ball/roller bearing should be greased at proper intervals. (T)
44. The temperature of a correctly fitted and properly lubricated bearing should not exceed 50° C. (T)
45. An alternating field can be replaced exactly by two rotating fields of half its amplitude travelling in opposite directions at synchronous speed. (T)
46. In a pulsating field the polarity reverses at the rate of supply frequency but the field is stationary in nature. (T)
47. An alternator cannot be operated as a synchronous motor. (F)
48. A 3-phase synchronous motor has 3-phase armature winding connected to a 3-phase ac supply and the rotor has an electromagnet excited from a dc source. (T)
49. A synchronous motor is provided with narrow air gap in comparison with that of induction motor. (F)
50. Direct-connected exciters are frequently found on high speed synchronous motors. (T)
51. In a synchronous motor the magnitude of field flux varies with the power factor. (T)
52. In a 3-phase synchronous motor the magnitude of field flux varies with the power factor. (F)
53. In a 3-phase synchronous machine the stator field is stationary and rotor field is rotating one in nature. (F)
54. In a 3-phase synchronous motor the rotor rotates in a direction opposite to that of the stator field. (F)
55. The direction of rotation of a 3-phase synchronous motor can be reversed by interchanging any two of the phase. (T)
56. The rotor poles of a synchronous machine are magnetically locked with its stator poles when the machine is running. (T)
57. A synchronous motor has no starting torque but when started it always runs at a fixed speed. (T)
58. A synchronous motor can withstand overload upto its maximum value of torque angle. (T)
59. A synchronous motor with comparatively larger air gap has poor stability limit. (F)
60. The working of synchronous motor is similar to transmission of mechanical power by shaft. (T)
61. When a synchronous motor operating under normal conditions is shut down and its field circuit is to be opened, this is done by connecting discharge resistance across its terminals. (T)
62. A synchronous motor with larger air gap has a high synchronising power which makes it less sensitive to variation in loads. (T)
63. Pull-out torque of a synchronous motor increases with the decrease in excitation. (F)
64. Pull-out torque and maximum torque are same in a synchronous motor. (T)
65. The torque developed by a synchronous motor is less sensitive to change in supply voltage. (T)
66. It is difficult to synchronous salient pole rotor synchronous machine in comparison to smooth cylindrical rotor machine. (F)
67. In an under-excited synchronous motor counter or back emf is greater than supply voltage. (F)
68. If the synchronous motor is over-excited its power factor tends to approach unity with the increase in load. (T)
69. A synchronous capacitor is a stationary device. (F)
70. A synchronous capacitor converts electrical energy into electrical energy. (T)
71. A synchronous motor when operated over-excited and without mechanical load can be employed for improving voltage regulation of a transmission line. (T)
72. Damper grids in a synchronous motor assist in increasing its stability. (T)
73. A 3-phase synchronous motor provided with damper grids is self-stability. (T)
74. Before synchronising a 3-phase synchronous motor to the supply it has to be run upto or near its synchronous speed by some external means. (T)
75. A synchronous helps in synchronising of a 3-phase synchronous motor. (T)
76. A 3-phase synchronous motor is started with its field energized from a dc source. (F)

77. The field winding of a 3-phase synchronous motor is energized from a dc supply source just before its rotor attains synchronous speed in order to avoid slipping of poles. **(T)**
78. A 3-phase synchronous motor provided with damper winding can be started on load. **(F)**
79. The synchronous motors are usually started by induction motor principle. **(T)**
80. Large 3-phase synchronous motor, specially those designed for starting under full load, use three phase wound rotor type winding. **(T)**
81. A synchronous motor in comparison to an induction motor is costlier and complicated. **(T)**
82. The synchronous motors in comparison to induction motors are cheaper in high speed range. **(F)**
83. The control equipment of a synchronous motor is more complex in comparison to that of an induction motor. **(T)**
84. Synchronous motors are widely used in industries for driving mechanical loads. **(F)**
85. Synchronous motors are made in large size for constant duty service. **(T)**
86. A synchronous motor can be employed to drive a synchronous generator for generating power at a frequency different from supply frequency. **(T)**
87. Synchronous motors are widely used for line shaft drives in small workshops. **(F)**
88. It is necessary to connect many alternators to a common bus-bar in order to share the total load on the system. **(T)**
89. Synchronisation process by lamp method is more accurate than that by synchroscope. **(F)**
90. A machine with a large airgap has a high synchronising power. **(T)**
91. Load shared by a synchronous generator is governed by its excitation. **(F)**
92. Eye bolt is provided on induction motors for lifting purposes. **(T)**
93. Frames for small induction motors are made as a single unit and are usually cast. **(T)**
94. The stator of an induction motor is similar in construction to that of a synchronous machine. **(T)**
95. The number of terminals in the terminal box of an induction motor is six. **(T)**
96. In squirrel cage induction motors the stator and rotor slots are of overhung type. **(T)**
97. Single layer concentric windings are employed in case of large induction motors operating at high voltages. **(T)**
98. Rotor core of a 3-phase induction motor is always laminated. **(T)**
99. The rotor core of a 3-phase squirrel cage induction motor has heavy copper or aluminium bars placed in its slots. **(F)**
100. The cage rotor is made of copper. **(T)**
101. The lamination of the rotor of an induction motor should be properly insulated against one another. **(F)**
102. The skewing of rotor slots gives more uniform torque. **(F)**
103. The rotor bars of a squirrel cage induction motor are open-circuited. **(F)**
104. The slip-rings of a wound rotor induction motor are insulated from the shaft. **(T)**
105. The rotor of an induction motor may be considered as an analog of a mechanical clutch. **(T)**
106. The air-gap between the stator and rotor of an induction motor is made as small as practicable in order to keep air gap reluctance minimum. **(T)**
107. An increase in the value of air gap flux density in an induction motor improves its power factor and efficiency. **(F)**
108. The emf induced in the rotor of an induction motor at synchronous speed is zero. **(T)**
109. The torque developed in a 3-phase induction motor at synchronous speed is maximum. **(F)**
110. The slip of a squirrel cage induction motor is small due to low resistance of rotor winding. **(T)**
111. The frequency of rotor current reduces with the increase in speed of an induction motor. **(T)**
112. In a 3-phase induction motor, the current varies directly as the voltage whereas the torque varies as the square of applied voltage. **(T)**
113. The breakdown torque of a 3-phase induction motor is independent of rotor resistance. **(T)**
114. In an induction motor, although the magnitude of maximum torque is independent of rotor resistance

- but its exact location depends upon the rotor resistance but its exact location depends upon the rotor resistance. (T)
115. The operating characteristics of an induction motor can be well adopted to a constant speed work. (T)
116. On increasing the starting torque of a 3-phase induction motor, the maximum torque decreases. (F)
117. Ratio of full load torque to maximum torque is always greater than unity. (F)
118. Torque exerted on the rotor of a 3-phase induction motor is proportional to the input power to rotor. (T)
119. Rotor efficiency can be expressed as the ratio of rotor actual speed to synchronous speed i.e. N/N_s . (T)
120. The no-load current of an induction motor consists of magnetizing component and no load loss component. (T)
121. The magnetizing component of the no-load current in a 3-phase induction motor is much less than component at no load. (F)
122. Rotor input in watts of an induction motor is also known as synchronously wattage. (T)
123. Synchronous wattage of an induction motor is equal to the power transferred across the air gap to the rotor. (T)
124. The power output of an induction motor will be maximum when slip is zero. (F)
125. In a 3-phase induction motor, power factor at starting is higher than that while running. (F)
126. When the load is increased on a 3-phase induction motor, the pf goes on increasing, reaches its maximum value at near about full load and then it decreases. (T)
127. The reading of wattmeter in no-load test on an induction motor gives only windage and friction losses. (F)
128. In blocked rotor test on an induction motor, the rotor runs at very slow speed. (F)
129. Starting current and starting torque can be determined from blocked rotor test on a squirrel cage induction motor. (T)
130. Blocked rotor test can be performed only on squirrel cage induction motor. (F)
131. Load test is performed at full load and upto 1.25 times full load of the motor. (T)
132. The starting torque of an induction motor can be determined from its circle diagram. (T)
133. A 3-phase induction motor starts up from rest and is not to be synchronised. (T)
134. Temperature rise test is carried out to determine the temperature rise at different parts of the motor while running at rated conditions. (T)
135. For motors with continuous rating, the temperature rise test should be continued till thermal equilibrium has been reached. (T)
136. In temperature rise test, whenever possible, temperature should be measured both while running and after switching off the supply. (T)
137. The synchronous speed of the nth order harmonic is 1/nth of the synchronous speed of the fundamental. (T)
138. An induction motor may fail to start at no-load because of cogging. (F)
139. The skewing of slots has no effect on the production of harmonics in any rotor. (F)
140. Improper alignment of shaft may result in decrease in speed of the motor. (F)
141. A double squirrel cage induction motor has two independent squirrel cage windings on the rotor, each having its own set of slots. (T)
142. The starting current of a double cage induction motor is comparatively higher than those of the ordinary squirrel cage and wound rotor induction motors. (F)
143. At the start of the motor the lower cage offers very low impedance to the flow of current in comparison to upper cage. (F)
144. The double cage induction motor has comparatively higher copper losses. (F)
145. During running condition of a double cage induction motor, most of the current flows through more than that developed by the upper cage. (F)
146. Slip-ring induction motors are cheaper in cost and much simpler and rugged in construction than squirrel cage type. (F)
147. Slip-ring induction motor cannot be started on road. (F)
148. The rotor of an induction motor gets its power through magnetic induction. (F)
149. The main advantage of wound rotor motor over

- squirrel cage induction motor is that it can be started with the help of rotor resistance. (T)
150. Squirrel cage induction motors are very useful when they are to be started against heavy loads. (T)
151. Induction motors require more maintenance in comparison to that for synchronous motors. (F)
152. The induction motor is much more sensitive to over-loads than a dc shunt motor. (F)
153. Low supply voltage is likely to cause operating temperature abnormally high owing to increase in core losses. (F)
154. Magnetic conditions of a motor may get disturbed seriously due to large change in supply voltage. (T)
155. An automatic star-delta starter has a time delay relay through which change-over from star to delta takes place automatically after a prefixed duration of time. (T)
156. The external rotor resistance in a slip-ring induction motor is cutout gradually as the motor picks-up speed. (T)
157. In a 3-phase wound rotor induction motor, the external starting resistance is used for the entire operating condition. (F)
158. If the speed of an induction motor is changed by changing the slip, the speed regulation will be poor. (T)
159. The speed of a 3-phase induction motor can be controlled very smoothly over a wide range. (F)
160. The speed of a squirrel cage induction motor can be controlled from rotor side. (F)
161. In the pole changing speed control method, there is only one stator winding. (F)
162. In the consequent-pole technique method of speed control the stator needs two windings. (F)
163. The speed of a squirrel cage induction motor can be changed by varying the slip. (F)
164. Slip of an induction motor can be changed by varying the voltage applied to the stator. (T)
165. In a variable frequency drive of induction motor v/f is constant to produce high starting torque. (F)
166. In variable frequency induction motor drives the ratio v/f is increased at low speed. (F)
167. In a variable frequency drive of induction motor v/f is kept constant to avoid saturation. (T)
168. A low resistance squirrel cage rotor gives high starting torque at low value of frequency. (T)
169. In a 3-phase wound rotor induction motor slip at a given load can be varied by varying the rotor circuit resistance. (T)
170. Efficiency of an induction motor increases by using rotor resistance speed control method. (F)
171. The speed of a 3-phase slip-ring induction motor can be controlled from stator as well as from rotor side. (T)
172. Rotor resistance speed control is used in situations when speed variation is required for short duration only. (T)
173. If the two induction motors used for cascade control have equal number of poles only cumulative cascading is possible. (T)
174. Kramer system of speed control is based on the emf injecting method. (T)
175. The speed of an induction motor cannot be controlled as easily and efficiently as that of a dc shunt motor. (T)
176. Stiff bearing may be a cause for not starting of an induction motor. (T)
177. Sparking at the brushes of a slip-ring induction motor may be one of the reasons to make the motor to run at lower speed. (T)
178. A 3-phase induction motor can be dried by blocking the rotor and circulating current at a voltage around 10% of rated voltage. (T)
179. If any two phases of a 3-phase induction motor are interchanged it will operate as an induction generator. (T)
180. The slip of an induction machine when operating as a generator is 2 - s. (F)
181. The torque-speed characteristics of the machine, as a generator resembles to those of the motor. (T)
182. When used in parallel with synchronous machine, an induction generator can deliver only lagging loads. (F)
183. A long air-gap in a synchronous induction motor makes it a stiffer machine with a large over-load capability. (T)
184. The operating principle of the linear induction motor is the same as that of a conventional rotary motor. (T)
185. The speed of a linear induction motor depends upon the number of poles, pole pitch and stator supply frequency. (F)

186. The speed of a linear induction motor can be increased increasing the number of poles, the supply frequency and pole-pitch being kept fixed. (F)
187. 'Emf effect' in a flat linear induction motor increases with the increase in number of poles. (F)
188. Commutator motors are recommended for use in mines. (F)
189. The brush shift against the direction of rotation of a Schrage motor gives improved power factor for both susynchronous and supersynchronous operation. (F)
190. The motors built in fractional-horse power sizes are technically termed small motors. (T)
191. In a single phase induction motor if rotor is initially given a start by some external means in either direction, the motor will run in that direction. (T)
192. The stator of a single phase induction motor carries one winding only. (F)
193. In a split-phase induction motor the auxiliary winding has a lower resistance to reactance ratio. (F)
194. Split-phasing in a split phase motor is done by transformer. (F)
195. For making a single phase induction motor self starting it is temporarily converted into a 2-phase motor, during starting. (T)
196. For single phase motors using centrifugal switches, the connections of auxiliary winding should be reversed only when the rotor is at rest. (F)
197. Resistance start induction motor has a higher efficiency than that of a permanent capacitor motor. (F)
198. In a capacitor-start single phase induction motor, capacitor is used in series with the motor to improve power factor. (F)
199. Electrolytic capacitors are used in capacitor-start motors. (T)
200. Capacitor-start capacitor-run motor finds application in small home air conditioning units. (T)
201. Permanent capacitor induction motor has low pf at full load. (F)
202. In a shaded pole motor, the laminated pole has a slot cut across the laminations approximately at one-third distance from one edge. (F)
203. A shaded pole motor is the only single phase induction motor which is inherently self starting. (T)
204. The shading coil of a shading pole is made of copper. (T)
205. In a shaded-pole motor, the effect of the shading ring is to reduce the flux in the shaded portion and, at the same time, to shift it in time phase behind the flux in the unshaded portion. (T)
206. A shaded-pole motor runs in the direction from the shaded to unshaded part of the poles. (F)
207. The shading bands do not produce any phase displacement between two fluxes in a shaded pole motor. (F)
208. Shaded-pole motors develop higher starting torque than 1-phase capacitor start motors. (F)
209. In a single phase induction motor, shading coil, when used degrades the power factor. (T)
210. Shaded-pole induction motors are used in refrigeration compressors. (F)
211. Speed control of split-phase induction motors is relatively difficult. (T)
212. The working principle of ac series motor is the same as that of a dc series motor. (T)
213. In ac motors the yoke and poles are completely laminated in order to reduce eddy current losses. (T)
214. AC series motors need not have laminated yokes. (F)
215. Large ac series motor are usually designed for operation on high frequencies. (T)
216. A small ac series motor operates at very low speed. (F)
217. For an ac series motor, on complete removal of mechanical load, the speed is limited by its own friction and windage load. (F)
218. The reactance voltage drop in an ac series motor tends to increase the speed with the increase in load. (F)
219. In a conductively compensated ac series motor, the compensating winding is connected in parallel with the armature. (F)
220. AC series motors have high torque to weight ratio than dc series motor of equal ratings. (F)
221. Compensating winding is provided in a series motor to improve its power factor. (T)
222. Power output to weight ratio is highest in case of universal motors in comparison to other single phase motors. (T)

223. Small universal motors are generally directly couples to load. (T) speed, the stator flux ceases to sweep across the rotor and the rotor acts like a permanent magnet. (F)
224. Universal motors are used in food mixer grinder. (T) 244. Synchronous hysteresis motors are most suitable for intermittent running. (F)
225. Small universal motors are suitable for grinding purpose. (T) 245. An hysteresis motor is a smooth noiseless motor. (T)
226. Universal motors are used in food mixer grinder. (T) 246. Hysteresis motors can pull-into step just about any load they can carry, regardless of the connected inertia of that load. (F)
227. A repulsion motor runs in the direction of brush shift. (T) 247. Eddy current motors operate on dc supply only. (F)
228. The starting torque and current drawn by a repulsion motor depends on the position of brushes. (T) 248. A permanenet magnet motor is variable reluctance motor. (F)
229. The direction of rotation of a repulsion-start induction motor can be reversed by changing the position of brushes. (T) 249. In servo-motors rapid response is obtained by low torque to inertia ratio. (F)
230. The speed of repulsion-start induction motor can be varied by brush-shifting. (T) 250. A Stepper motor is a constant reluctance motor. (F)
231. Repulsion motors are unsuitable for high speed running. (T) 251. Stepper motors are generally used to achieve very fine speed control. (T)
232. A reluctance motor is a synchronous motor without dc excitation. (T) 252. A motor convertor is self starting. (T)
233. The rotor of a reluctance motor comes upto nearly synchronous speed by synchronous motor action. (F) 253. A motor convertor can be operated on any frequency. (T)
234. The air-gap reluctance of a reluctance motor is uniform. (F) 254. When a rotary convertor receives power from dc supply mains and deliver ac power, it is called direct rotary convertor. (F)
235. The physical dimensions of reluctance motors are somewhat smaller than other types of motors of same output rating. (F) 255. A synchronous convertor is not portable. (T)
236. Value of slip in a reluctance motor is large. (F) 256. A rotary convertor is liable to flashover and reversal of polarity. (T)
237. The reluctance motors are usually built in fractional horse power sizes. (T) 257. A rotary convertor operates on low power factor. (T)
238. Reluctance motors operate on dc as well as on ac. (F) 258. Rating of rotary convertor increases with the increase in number of phases. (T)
239. Reluctance motors have high starting torques. (F) 259. The copper oxide rectifier used to find applications in control circuits and is adaptable to various voltages and currents. (T)
240. Reluctance motor employs the conventional split phase stator and a centrifugal switch to open auxiliary winding. (T) 260. The copper oxide rectifier is a non-linear device and its copper losses need large heat dissipation. (T)
241. In case of a hysteresis motor, the induced emf in the rotor will be maximum at the synchronous speed. (F) 261. The copper oxide rectifier can be used on polyphase circuits to supply large values of currents. (F)
242. Hysteresis motor has no winding on rotor. (T) 262. Selenium rectifiers are more efficient than the mercury arc recitifiers when operated on high voltage system. (F)
243. When the hysteresis motor attains the synchronous (T) 263. Ageing of a selenium rectifier may change its output by 5 to 10 percent. (T)

264. The ignition or auxiliary anode used in mercury-arc rectifier is made of boron oxide. (T)
265. In a mercury-arc rectifier, the voltage drop at the cathode is about 5.5 V. (T)
266. In a mercury-arc rectifier, the voltage drop across its electrodes is almost independent of load current. (T)
267. A mercury arc rectifier has low response to load demands. (F)
268. In comparison to glass tube rectifier metal tank rectifier can withstand more voltage on dc side. (T)
269. Metal tank rectifiers are mounted in a vacuum chamber of steel, are dismantable, continuously evacuated and are water cooled. (T)

FILL IN THE BLANKS

1. In a C.S.D. when oil is pumped to the fixed displacement unit by the variable displacement unit, then the former is functions as a hydraulic _____. (pump, **motor**)
2. When the input speed supplied to a C.S.D. is more than that needed to produce the required output speed, the governor causes charge oil to _____ the control valve. (**flow away from**, supplied to)
3. When the input speed supplied to a C.S.D. is less than that needed to produce the required output speed, the governor causes charge oil to be _____ the control valve. (flow away for, **supplied to**)
4. To indicate the disconnection of a C.S.D. transmission system, in some mechanism a magnetically-Operated indicator button is provided in the _____. (C.S.D. tsel, **reset handle**)
5. If indicator is provided in the system, then it the indicator is protrude out it indicate that C.S.D. transmission system is _____. (connected, **disconnected**)
6. In a generator with constant speed drive, the exciter output is converted into d.c. by _____. (fixed rectifier assembly, **rotating rectifier assembly**)
7. The rectifier assembly used for converting the exciter output in a constant speed drive generator is located on _____. (stator, **rotor**)
8. The exciter of a constant field drive generator is having a _____ armature. (static, **rotating**)
9. The rotor of the exciter of a constant field drive generator is having _____ winding. (single phase, **three phase**)
10. To suppress the voltage spikes created within the diodes of rectifier assembly in a constant drive generator, _____ is connected in rectifier circuit. (inductor, resistance, **capacitor**)
11. In parallel operation of constant speed drive generator, the damper winding helps to _____ transient voltage. (increase, **reduce**, maintain same)
12. The primary windings of the compounding transformer of a frequency-wild generator is connected in _____ with the three phases of generator. (**series**, parallel, series-parallel)
13. The secondary windings of the compounding transformer of a frequency-wild generator is connected in _____ with the compounding rectifier. (**series**, parallel, series-parallel)
14. In the field excitation of frequency-wild generator, when the control switch is in 'start' position, d.c. from main busbar is supplied to the generator _____ windings. (stator, **rotor**)
15. The purpose of compounding transformer and rectifier in a frequency-wild generator is to supply direct current to rotor field windings in proportional to _____ current. (excitation, **load**, surge)
16. The excitor of constant speed drive generator is having _____ permanent magnets. (four, **six**, ten)
17. In the exciter of a constant speed drive generator, a _____ is provided as a temperature compensator. (thermal switch. inductor, **thermistor**)
18. In low or normal ambient temperature the thermistor of the exciter of constant speed drive generator, _____ current flow, to its winding circuit. (**blocks**, allow)
19. The rectifier assembly of the exciter of constant speed drive generator is consisting of _____ silicon diodes. (four, **six**, eight)
20. The stabilizing winding of the exciter of constant speed drive generator is providing feed back signal to _____. (rectifier, thermistor, **voltage regulator**)
21. In case of an induction motor, the frequency of the rotor current is the same as the supply frequency, when the motor is _____. (running, **stationary**)
22. The resistance of a squirrel cage rotor is fixed and _____ as compared to its reactance. (**small**, high)
23. The starting current of the rotor of an induction motor is _____ in magnitude. (small, very small, **very large**)
24. The starting current of the rotor of an squirrel-cage induction motor _____ by a very large angle with rotor e.m.f. (leads, **lags**)

25. The starting torque of a squirrel-cage induction motor is roughly _____ times the full load torque. (1.5, 5.5, 7.5)
26. The starting current of a squirrel-cage induction motor is roughly _____ times the full load current. (1 to 2, 2.5 to 3.5, **5 to 7**)
27. The squirrel cage induction motors are _____ where the motor has to start against heavy loads. (useful, **not useful**)
28. The starting torque of a slip-ring induction motor is increased by adding external resistance in _____ circuit. (**rotor**, stator)
29. The torque of an induction motor is _____ sensitive to any changes in the supply voltage. (less, **very**, not)
30. In an induction motor the value of e.m.f. induced in the rotor at standstill is _____. (minimum, **maximum**)
31. In an induction motor, for a slip 's', the rotor induced e.m.f. will be _____ the induced e.m.f. at standstill. (half, double, **s times**)
32. In an induction motor, the induced e.m.f. in the rotor is _____ proportional to the relative speed between the rotor and stator flux. (**directly**, inversely)
33. The maximum torque of an induction motor varies _____ as standstill reactance. (directly, **inversely**)
34. To get a good starting torque in an induction motor, the standstill reactance of rotor should be kept as _____ as possible. (**small**, high)
35. Below the 'break down' torque, in an induction motor, as the slip increases, the torque will _____. (**increase**, decrease, remain same)
36. Beyond the 'break down' torque, in an induction motor, as the slip increases, the torque will _____. (increase, **decrease**, remain same)
37. The maximum torque of an induction motor is _____ rotor resistance. (dependent on, **independent of**)
38. The exact location of maximum torque of an induction motor is _____ rotor resistance. (**dependent on**, independent of)
39. In an induction motor, _____ is necessary in order to induce the rotor current. (torque, **slip**, speed regulation)
40. A squirrel -cage induction motor is often classified as a _____ speed motor. (**constant**, variable)
41. During start-up of squirrel-cage induction motor, the motor current _____ the supply voltage by a very large angle. (leads, **lags**)
42. The power factor of a squirrel-cage induction motor is improves as its load is _____. (decreased, **increased**)
43. The stator iron loss in an induction motor is practically _____. (variable, **constant**)
44. The iron loss of the rotor of an induction motor is _____. (maximum, **negligible**)
45. The frequency of rotor currents of an induction motor under normal running condition is always _____. (**small**, medium, high)
46. The speed of a induction motor _____ with increase in load. (**decrease**, increase)
47. In an induction motor, greater the number of poles, _____ the speed. (greater, **lesser**)
48. The stator winding of an induction motor, when supplied with 3 phase current, produce a magnetic field which is of _____ value. (fluctuating, **constant**)
49. The rotor bars of an squirrel-cage induction motor are brazed or electrically welded to _____ heavy and stout short-circuiting end rings. (**two**, three, four)
50. The number of brushes in a squirrel-cage induction motor is _____. (2, 6, **nil**)
51. When the stator of phase-wound induction motor is wound two-phase. then the rotor is wound _____. (single phase, two phase, **three phase**)
52. The brushes of a phase-wound induction motor is externally connected to a _____. (copper bar, end rings, **reostat**)
53. Slipring and brushes are used for _____ rotor of induction motor. (squirrel-cage, **phase-wound**)
54. During starting of phase-wound induction motor, it is _____ to insert an external resistance in starting circuit. (**possible**, not possible)
55. The direction of induced e.m.f. in the rotor of an induction motor is given by _____ (Fleming's left hand rule, **Fleming's right hand rule**, Lenz's law)
56. The rotor of an induction motor is running in the _____ direction as that of the flux. (**same**, opposite)
57. The auto-transformer starter used for squirrel-cage induction motor is applying reduced voltage across motor _____ during starting period. (**stator**, rotor)
58. If 65% tapping of an auto-transformer starter is used for starting of a squirrel cage induction motor, then the starting torque developed by the motor will be _____ % of the full load torque. (25, **42.2**, 65)

59. Generally a _____ switch is used for connecting the auto-transformer in the circuit for starting a squirrel-cage induction motor. (single-throw, **double throw**, micro)
60. While a squirrel-cage induction motor is started by a star-delta starter, the current in each phase will be _____ of the current which the motor would have taken if connected directly across the supply. (half, double, **one-third**)
61. The slip-ring induction motor is started with all the starter resistance in circuit, thus giving _____ starting torque. (**maximum**, minimum)
62. During starting of slip-ring induction motor, when the motor comes upto its full load speed, the starting resistance is reduced to zero, and the slip-rings are _____ (**short-circuited**, open-circuited)
63. A three-phase induction motor is a _____ motor. (**self starting**, non-self-starting)
64. A single-phase induction motor is a _____ motor. (self starting, **non-self starting**)
65. The stator of a single-phase induction motor produces a _____ flux. (rotating, **pulsating**)
66. During starting, a split-phase induction motor behaves like a _____ motor. (single phase, **two-phase**, three phase)
67. The centrifugal switch used in a split-phase induction motor is located _____ the motor. (**inside**, outside)
68. During starting of a split-phase induction motor, when the motor reaches 70 to 80 percent of its full load speed, the starting winding is automatically disconnected by _____. (main winding, rotor winding, **centrifugal switch**)
69. In buffing machines, the motor which is normally used is _____ induction motor. (capacitor-short and run, **split-phase**, shaded pole)
70. During starting of capacitor-start induction-run motor, the angle between currents of starting winding and main winding is _____. (**large**, small)
71. In a capacitor start induction-run motor, the capacitor is connected in _____ with the starting winding. (series, parallel, **series**, parallel)
72. During starting of capacitor-start induction-run motor, when the motor attains 75% of its full load speed, then the starting winding and capacitor are cut off by _____. (main winding, **centrifugal switch**, micro switch)
73. The centrifugal switch of a capacitor-start induction-run motor is cut off the starting winding during starting when the motor runs upto nearly _____ of its load speed. (25%, **75%**, 100%)
74. During starting of a capacitor-start induction-run motor, the current drawn by the starting winding _____ the voltage. (**leads**, lags, in phase with)
75. During starting of a capacitor-start induction-run motor the current drawn by the main winding _____ the voltage. (leads, **lags**, in phase with)
76. The starting torque developed by a capacitor-start induction-run motor is nearly _____ of the torque developed by a split-field induction motor. (one fourth, **double**, half)
77. Capacitor-start induction-run motor is normally used in _____. (washing machines, **compressors**, refrigerators)
78. The capacitor-start induction-run motors are very popular for general purpose applications requiring _____ torque. (**high**, low, medium)
79. In capacitor-start-and-run motors the starting winding and capacitor are connected in the circuit for _____ (starting time only, **all times**)
80. There are _____ centrifugal switches in a capacitor-start-and-run motor. (one, two, **no**)
81. The capacitor-start-and-run motors are normally having a _____ starting torque. (high, **low**, medium)
82. The capacitor-start-and-run motors are generally _____ for belted applications. (suitable, **not suitable**)
83. The capacitor-start-and-run motors are generally _____ for continuous-duty application requiring large locked-rotor torque. (suitable, **not suitable**)
84. In a shaded-pole motor, the short circuited copper coil is placed around the _____ part of the pole. (**smaller**, bigger)
85. In a shaded-pole motor, the part of the pole where the copper coil is placed is known as _____ pole. (**shaded**, unshaded)
86. The shaded-pole motors are generally have _____ starting torque. (**low**, high, medium)
87. In a photocopying machine normally _____ motors are used. (split-phase, capacitor-start-and-run, **shaded-pole**)
88. In a repulsion motor, when the brush axis is at angle α with field axis, then torque will _____ in the armature. (**developed**, not developed)

89. The torque developed in a repulsion motor is having similarity with d.c. _____ motor. (**series**, shunt, compound-wound).
90. A repulsion motor is generally having a _____ starting torque. (**high**, low, medium)
91. A repulsion motor is normally have _____ speed regulation. (good, **poor**)
92. In case of a repulsion motor, the direction of rotation _____ reversed during rotation. (**can be**, can not be)
93. A repulsion-start induction-run motor will run as induction motor when the motor speed is reached nearly _____ of its full load speed. (25%, 50%, **75%**)
94. A repulsion-start induction-run motor is generally _____ noisier. (**more**, less)
95. A repulsion-start induction-run motor can withstand _____ starting periods than capacitor type motors. (**longer**, shorter)
96. In a repulsion-induction motor _____ independent rotor windings are there. (**two**, three, four)
97. In a repulsion induction motor there is _____ centrifugal switch to short-circuit the commutator. (one, two, **no**)
98. The characteristics of a repulsion-induction motor is comparable to a d.c. _____ motor. (shunt, series, **compound**)
99. A repulsion-induction motor can be termed as a _____ speed motor. (**constant**, variable)
100. A repulsion induction motor is having a _____ starting torque. (**high**, low, medium)
101. A universal motor is generally a smaller version of d.c. _____ motor suitably modified to use on a.c. also. (shunt, **series**, compound)
102. The adverse effects of a d.c. series motor is minimised in a universal motor by using few series field turns and a _____ reluctance magnetic path. (**low**, high)
103. In a Universal motor _____ flux densities are used. (**low**, high)
104. The number of armature conductors and commutator segments in a universal motor is _____ a d.c. series motor of equal rating. (**more than**, less than, equal to)
105. The direction of rotation of a universal motor on a.c. supply is the _____ as on d.c. supply. (opposite, **same**)
106. The universal motors are usually wound for operation in _____ direction. (**one**, either)
107. A universal motor is having _____ starting torque. (**high**, low)
108. The universal motors are normally having a _____ speed characteristics. (constant, **variable**)
109. The universal motors are running at dangerously high speed at _____ load. (**no**, medium, full)
110. A universal motor is normally used in a _____. (compressor, refrigerator, **vacuum cleaner**)
111. The reluctance synchronous motors are usually a single-phase _____ synchronous motors, (excited, **non-excited**)
112. In a reluctance synchronous motor the d.c. power supply is _____ for exciting its rotor. (required, **not required**)
113. The rotor of a reluctance synchronous motor is squirrel-cage type and of _____ construction. (symmetrical, **unsymmetrical**)
114. In a reluctance synchronous motor, by removing some of the teeth of a normal squirrel-cage rotor, salient poles are produced which offer _____ reluctance to the stator flux. (**low**, high, medium)
115. During starting of a reluctance synchronous motor, a point is reached when the rotor snaps into synchronism with the _____ stator flux. (**revolving**, stationary)
116. As compared to an equivalent induction motor, the reluctance synchronous motors are having _____ torque. (higher, **poor**)
117. Reluctance synchronous motors are normally used for _____ speed applications. (**constant**, variable)
118. The application of reluctance synchronous motor is normally found in _____ (swimming pools, sewing machines, **signalling devices**)
119. The hysteresis synchronous motor is a single phase _____ synchronous motor. (excited, **non-excited**)
120. The rotor of a hysteresis synchronous motor is a _____ pole rotor. (salient, **non-salient**)
121. During starting of hysteresis synchronous motor, as the motor develops speed, hysteresis loss occurs in the _____ which produces large driving torque. (stator windings, shading coil, **rotor rings**)
122. A hysteresis synchronous motor is extremely _____ in operation. (noisy, **quiet**)

123. A hysteresis synchronous motor is generally used in a _____. (vacuum cleaner, mixer-grinder, **electric clock**)
124. A synchronous motor is usually a _____ speed motor. (**constant**, variable)
125. A synchronous motor is not _____ self starting. (**inherently**, not inherently)
126. In case of a synchronous motor, when 3-Q stator winding is fed by a 3-Q supply, and the rotor poles can not shift their position along with the stator poles, then the torque on the rotor will be _____. (unidirectional, **reversing rapidly**)
127. In case of a synchronous motor, when 3-Q stator winding is fed by a 3-Q supply, and the rotor poles shift their position along with the stator pole, then the torque on the rotor will be _____. (**unidirectional**, reversing rapidly)
128. During initial position of starting of synchronous motor, d.c. supply is _____ to the rotor. (fed, **not fed**)
129. As the d.c. excitation is fed to the synchronously rotating rotor of a synchronous motor, the rotor will be _____ with the stator. (**locked**, unlocked)
130. In a synchronous motor a back e.m.f. is set-up in the _____. (**stator**, rotor)
131. The net voltage in the armature of a synchronous motor is the _____ difference of applied voltage and phase difference. (arithmetical, **vector**)
132. When the back e.m.f. of a synchronous motor is equal to the applied voltage then it is called _____ excited synchronous motor. (**normal**, under, over)
133. When the back e.m.f. of a synchronous motor is less than the applied voltage, then it is called _____ excited synchronous motor. (normal, **under**, over)
134. When the back e.m.f. of a synchronous motor is more than the applied voltage, then it is called _____ excited synchronous motor. (normal, under, **over**)
135. An under-excited synchronous motor is having a _____ power factor. (leading, **lagging**, in phase)
136. An over-excited synchronous motor is having a _____ power factor. (**leading**, lagging, in phase)
137. A normal excited synchronous motor is having a _____ power factor. (leading, **lagging**, in phase)
138. A synchronous motor _____ increasing its armature current by decreasing its speed when load is increased. (can, **cannot**)
139. In a normal excited synchronous motor, when the load is increased, the voltage in armature is _____. (**increased**, decreased, remain same)
140. In a under-excited synchronous motor, when load is increases, the power factor is _____. (**increased**, decreased, remain same)
141. In a over-excited synchronous motor, when the load is increases, the power factor angle is _____. (increased, **decreased**, remain same)
142. The starting torque of a synchronous motor is also known as _____ torque. (**breakaways**, pull-in, pull-out)
143. The peak horsepower determines the maximum _____ torque of a synchronous motor that would be required by the driven machine. (starting, **running**, pull in)
144. When field current of a synchronous motor is reduced, the motor pull out torque is _____ in proportion. (increased, **reduced**)
145. The magnitude of armature current of a synchronous motor varies with _____. (speed, **excitation**)
146. An over-excited synchronous motor is called a synchronous capacitor because it draws _____ current from the line. (**leading**, lagging, in phase)
147. To prevent the hunting of the rotor in a synchronous motor _____ is used. (centrifugal switch, interpole, **damper**)
148. The dampers of a synchronous motor consist of _____. (copper bars, copper windings, **short-circuited copper bars**)
149. In a synchronous motor the dampers are embedded in the faces of the _____ of the motor. (**field poles**, armature poles, body)
150. The oscillatory motion of the rotor of a synchronous motor sets up _____ in the dampers. (small e.m.f., large e.m.f., **eddy currents**)
151. During starting of a synchronous motor, the stator winding induces a _____ e.m.f. in the rotor winding. (small, very small, **very large**)
152. During starting of a synchronous motor, the e.m.f. which induces on rotor goes on _____ as the rotor gathers speed. (increasing, **decreasing**)
153. While starting of a synchronous motor provided with damper winding, first the main field winding is to be _____. (open circuited, **short circuited**)
154. During starting of a synchronous motor provided with damper winding, _____ voltage is applied across stator winding. (full, **reduced**, nil)

155. Over excited synchronous motor having leading power factor are widely used for _____ (voltage regulation, constant speed, constant load drive, **improving power factor**)
156. In at reciprocating compressor the motor which is normally used is _____ (**high speed synchronous**, low speed synchronous, induction)
157. In a centrifugal and screw-type pump the motor which is normally used is _____ motor. (high speed synchronous, **low speed synchronous**, induction)
158. The voltage at the end of along transmission line varies greatly especially when large _____ loads are present. (resistive, **inductive**, capacitive)
159. In a transmission line when an inductive load is disconnected suddenly, voltage tends to _____ considerably. (**rise**, fall).
160. A synchronous machine taking mechanical input and delivering electrical output is known as the synchronous _____. (**generator**)
161. A machine which generates ac is called the _____. (**alternator**).
162. Revolving field typw alternator has a _____ armature or stator, inside of which field structure _____. (**stationary, rotates**)
163. The revolving field structure in an alternator is called the _____. (**rotor**)
164. Hydro-generators are usually of _____ type. (**vertical**)
165. The maximum allowable heating in the armature winding governs the maximum _____ output available from the machine. (**KVA**)
166. The field coils of synchronous machine are _____ insulated and _____ impregnated. (**cotton, varnish**)
167. The field coils of a synchronous machine are usually _____ type former wound. (**rectangular**)
168. The flux density is _____ on the central polar line of rotor. (**maximum**)
169. The resultant flux of a polyphase winding is of _____ magnitude. (**constant**)
170. The rotor of an altnerator has _____ slip-rings. (**2**)
171. The most common type prime-mover used for slow speed altenator is _____ turbine. (**hydraulic**)
172. An alternator driven by a Francis turbine is a _____ speed alternator. (**low or medium**)
173. Turbo-altenator are usually operated at a speed of _____ rpm. (**3,000**)
174. Non-salient or smooth cylindrical rotors are generally employed with _____ speed alternator. (**speed**)
175. The frequency of generated emf by a synchronous generator can be adjusted by egulating the _____ of the prime-mover. (**speed**)
176. The reason for an altenator to generate ac at a lower frequency is due to _____ of the prime-mover. (**lower speed**)
177. The permissible duration for which a generator of rated frequency 50 Hz can run at 46 Hz is _____ second. (**one**)
178. A great deal of air-craft equipment operates with voltage of frequency of _____ Hz. (**400**)
179. The span of each coil must be equal to pole-pitch i.e. the two sides of any coil may be under _____ poles. (**adjacent**)
180. The coils are so connected that emfs induced in them _____ each other. (**help**)
181. The winding for ac machines is designed to give induced emf of approximately _____ form. (**sinusoidal**)
182. Double layer winding will have two _____ per slot. (**coil-sides**)
183. Polyphase synchronous machines have two or more single phase winding _____ spaced around the stator. (**equally**)
184. The armature winding having conductors placed in several slots under one pole, is known as _____ winding. (**distributed**)
185. In a fractional pitch winding the coil span is less than _____ electrical degrees. (**180**)
186. The pitch factor can never exceed. (**unity**)
187. If a coil is short-pitched by an angle a the pitch factor is _____. (**$\cos \alpha / 2$**)
188. The coil span factor for a 3-phase winding with 4 slots per pole per phase and with the coil span of 10 slots pitch is _____. (**0.966**)
189. The coil span factor for a 3-f distributed winding with full-pitch coils is _____. (**unity**)

190. The distribution factor for a 36 slot stator with three phase, 8-pole winding, having 120° phase spread is _____. **(0.844)**
191. The distribution factor for a 3-phase winding with 4 slots per pole per phase is _____. **(0.9577)**
192. For getting maximum mmf, the coil span should be equal to _____ pole pitch. **(one)**
193. Amplitude of armature mmf wave is proportional to the _____ current. **(load)**
194. The position of armature mmf wave depends on the _____ of the load. **(power factor)**
195. The armature resistance voltage drop is _____ in case of an alternator. **(negligible)**
196. The synchronous impedance of a large sized modern alternator is approximately _____ pu. **(1.0)**
197. The ratio of armature leakage reactance to synchronous reactance of a large size modern synchronous generator is around _____. **(0.2)**
198. Synchronous reactance can be defined as sum of _____ and _____ reactance. **(leakage magnetization)**
199. The synchronous reactance of a 200 MVA, 10 KV, 3-f, 50 Hz generator is 1.0 pu at its own base. Its pu reactance at 100 MVA, 20 KV base will be _____. **(0.125)**
200. Regulation of an alternator is better at or near unity power factor but becomes _____ at low power factors. **(poor)**
201. In an alternator with the fall in leading power its voltage _____ from no load to full load. **(rises)**
202. Voltage of an alternator can be changed by varying its _____. **(excitation)**
203. A single phase alternator has a synchronous reactance of 2 W and negligible resistance. If it supplies 10 A to a purely capacitive load at 200 V, the generated emf will be _____ V and the regulation will be _____ %. **(180, -10)**
204. The quadrature axis synchronous reactance of a salient pole alternator is _____ than the direct axis synchronous reactance. **(lesser)**
205. The maximum efficiency of an alternator occurs at about _____ per cent of full load. **(75)**
206. Stray losses in electrical machines consist of friction and windage losses and _____ loss. **(rotor core)**
207. Excessive windage loss and noise occur with _____ pole rotors. **(salient)**
208. Small synchronous machines are usually _____ cooled while large capacity machines are usually _____ cooled. **(air, hydrogen)**
209. Thermal conductivity of hydrogen is nearly _____ times of that of air while its density is about _____ per cent of that of air. **(7.5, 7)**
210. In a two phase winding two windings are _____ electrical degrees apart from each other. **(9.0)**
211. The resultant flux produced by a two phase winding always rotates at _____ speed. **(synchronous)**
212. In a 3-phase winding three windings are _____ electrical degrees apart from each other. **(120)**
213. The instantaneous resultant flux set up by a three phase winding will be equal to _____ of the instantaneous values of fluxes set up separately by three windings. **(sum)**
214. The resultant flux set up by a three phase winding makes _____ revolution(s) pe cycle. **(one)**
215. KW rating of an exciter for a synchronous motor is about _____ per cent of the kva rating of the synchronous motor. **(3)**
216. Separate motor-generator sets are widely used for excitation of _____ speed synchronous motors. **(10w)**
217. Slip-rings in a synchronous motor carry _____. **(dc)**
218. The decreased excitation to synchronous motor causes _____ power factor. **(lagging)**
219. The synchronous motor is non _____ type. **(induction)**
220. The percentage full-load slip in case of a synchronous motor is _____. **(zero)**
221. The speed regulation of a synchronous motor is always _____. **(zero)**
222. A synchronous machine is said to be _____ when operated on no-load and without losses. **(floating)**
223. The maximum torque that a synchronous motor can develops without loss of synchronism is known as _____ torque. **(pull out)**
224. Synchronous motor may fall out of synchronism and

- stop when the load torque exceeds the _____ torque. **(pull out)**
225. In synchronous motors, the pull out torque is usually _____ of full-load torque. **(120 to 300%)**
226. In a synchronous motor the magnitude of counter emf can be varies by varying _____. **(dc excitation)**
227. For 100% excitation in a synchronous motor the counter emf is _____ applied voltage. **(equal to)**
228. The induced emf or excitation voltage in a synchronous motor operating at leading power is _____ applied voltage. **(more than)**
229. The synchronous motor operating underexcited will have _____ power factor. **(lagging)**
230. An over-excited synchronous motor draws current at _____. **(leading power factor)**
231. A synchronous motor draws _____ current from 3-f ac supply mains at unity power factor. **(minimum)**
232. The excitation that gives minimum armature current and unity power factor for a synchronous motor is known as _____ excitation. **(normal)**
233. Maximum power developed by a synchronous motor is given as _____. **($\sqrt{2}/4Re$)**
234. The region in which the excitation or field current is less than its normal value is known as region of _____ excitation or region of _____. **(under, lag)**
235. The region in which the excitation of field current is more than its normal value is known as the region of _____ excitation or region of _____. **(over, lead)**
236. A synchronous motor working at leading power without mechanical load is known as synchronous _____. **(condenser)**
237. A synchronous motor operated at power factors ranging from lagging through unity to leading without mechanical load is also called the _____ reactor. **(synchronous)**
238. A synchronous motor has a tendency to _____. **(hunt)**
239. The duration of sudden short-circuit test on a synchronous motor is usually about _____. **(one second)**
240. The process of connecting an alternator in parallel with another alternator or with common bus-bars is called the _____. **(synchronising)**
241. For parallel operation, the frequencies of two machines should be _____. **(same)**
242. When two alternator are operating in proper synchronous, the synchronising power will be _____. **(zero)**
243. In a system there are two generator operating in parallel. One generator, of rating 250 MVA, has an inertia constant of 6 MJ/MVA while the other generator of 150 MVA has an inertia constant of 4 MJ/MVA. The inertia constant for the combined system on 100 MVA common base is _____ MJ/MVA. **(21)**
244. Yoke of an induction motor is made of _____. **(cast iron)**
245. The frames of _____ and _____ sized machines are fabricated from rolled steel plates. **(medium, large)**
246. The thickness of stator laminations for an induction motor varies from _____ mm to _____ mm. **(0.35, 0.65)**
247. The stator slots used in a 3-phase induction motor are usually of _____ type. **(semi-closed)**
248. The air gap is usually from _____ to _____ mm in small rating induction motors. **(0.3, 0.35)**
249. The air gap is usually from _____ to _____ mm in large rating induction motors. **(1.0, 1.5)**
250. Under operating conditions the rotor winding of a wound type induction motor is _____ at the slip-rings. **(short-circuited)**
251. The end rings in rotor of cage type induction motor acts as a _____ circuit on the individual rotor bar. **(short)**
252. The number of slip-ring(s) on a squirrel cage induction motor is _____. **(none)**
253. In a 3-phase slip-ring induction motor the number of poles on rotor is always _____ number of poles of stator. **(equal to the)**
254. The number of slip-rings on a 3-phase wound rotor induction motor is _____. **(3)**
255. In a 3-phase slip-rings induction motor the number

- of poles on rotor is always _____ number of poles of stator. **(equal to the)**
256. The resultant flux developed by stator of a 3-phase induction motor is _____ the maximum values of flux due to one phase. **(1.5 times)**
257. The rotating magnetic field produced by stator currents rotates at _____ speed. **(synchronous)**
258. The speed of rotor of an induction motor is always _____ synchronous speed. **(lesser than)**
259. The direction of rotation of an induction motor depends upon the _____. **(phase sequence)**
260. The difference between the synchronous speed and the actual speed of an induction motor is known as the _____. **(slop)**
261. The no-load slip of a 3-phase induction motor is usually _____. **(I)**
262. At normal load the slip of induction motor is usually _____. **(4 percent)**
263. The value of slip of an induction motor at the starting instant is _____. **(unity)**
264. The slip of induction motor at synchronous speed will be _____. **(zero)**
265. An induction motor runs stably under constant torque load at 1,250 rpm at a 50 Hz supply. Its number of poles is _____. **(4)**
266. The speed of an induction motor _____ with the increase in slip. **(decreases)**
267. If the squirrel-cage rotor is replaced by a solid cylinder in an induction motor its no load slip will _____. **(increase)**
268. An induction motor always operates at _____ power factor. **(lagging)**
269. A 3-phase induction motor can achieve the maximum value of power factor to be _____. **(0.9)**
270. An induction motor at starting behaves like a _____ circuited transformer. **(short)**
271. A change of 5% in supply voltage to a 3-phase induction motor will cause approximately _____ change in torque. **(10%)**
272. The load-speed characteristics of an induction motor resembles with those of a dc _____ motors. **(Shunt)**
273. Variable losses of induction motor are _____ and _____. **(stator, rotor, copper losses)**
274. Stator iron loss in an induction motor is practically _____. **(constant)**
275. In a 3-phase induction motor iron loss in rotor is _____ in comparison to that of a stator. **(negligible)**
276. The efficiency of a 3-phase induction motor is expected to be about _____. **(88%)**
277. The efficiency of an induction motor is _____ that of a transformer. **(lower than)**
278. The presence of odd harmonics in the stator current may cause _____. **(crawling)**
279. Skewing of rotor slots _____ rotor resistance. **(increase)**
280. Double cage induction motors are designed to achieve high _____ torque. **(starting)**
281. The outer winding bars of a double cage induction motor are usually of _____ while the inner winding bars are of _____. **(manganese, red copper)**
282. The efficiency of a synchronous motor is _____ than that of an induction motor of same size and output rating. **(more)**
283. The cost of a synchronous motor is _____ in comparison to that of an induction motor of same size and output rating. **(high)**
284. Direct-on-line starter is normally used for starting of induction motors upto _____ KW rating. **(4)**
285. When started by means of an auto-transformer with 50% tapping, supply current at start of an induction motor is reduced to _____ to that when started by means of a star-delta starter. **(3/4)**
286. In a variable frequency induction motor drive, the voltage must be varied _____ to the frequency. **(indirect proportion)**
287. A 3-phase, 20 KW, 400 V, 1470 rpm, 50 Hz squirrel cage induction motor develops a torque of 100 Nm at a speed of 1,400 rpm. If the motor is connected to a 30 Hz supply, for keeping the same air gap flux, the supply voltage should be _____ and for the same load torque, the new speed will be _____ rpm. **(240v, 840)**
288. A six pole, 50 Hz induction motor rotating at 1,440 rpm is in _____ mode. **(generating)**

289. If the airgap of the induction motor is increased, the magnetizing current of the motor will _____ . **(increase)**
290. A thermal over-load relay for an induction motor provides protection against _____ . **(over load)**
291. By pushing and pulling the rotor shaft a motor can be checked for _____ . **(end play)**
292. For high voltage test on an induction motor, the recommended voltage should not be applied more than _____ . **(once)**
293. The high voltage test and insulation resistance test on an induction motor should be carried out at the works of _____ . **(manufacturer)**
294. If a polyphase induction motor while connected to a constant voltage and frequency mains is mechanically coupled to a prime-mover and is driven at a speed higher than synchronous speed. It will operate as an induction _____ . **(generator)**
295. The slip of an induction machine when operating as a generator is _____ . **(negative)**
296. The synchronous induction motor is provided with a _____ air gap as expected in a plain _____ motor. **(larger, synchronous)**
297. The synchronous induction motor is usually not made in size below _____ KW capacity. **(25)**
298. The linear synchronous speed of a linear motor is given as $V_s = \frac{2\pi f t}{60}$ where t is the pole pitch in meters and f is the stator supply frequency in Hz. **($2\pi f$)**
299. There are two peculiar effects, which are encountered in a linear induction motor but not in a conventional rotary induction motors. These effects are _____ and _____. **(transverse, edge effect)**
300. The Schrage motor is started with the brushes set in the _____ speed position. **(minimum)**
301. Fractional horse power motors are usually _____ phase type. **(single)**
302. The rotor construction of a single phase induction motor is identical to that of a three phase _____ motor. **(induction)**
303. The rotating part of a single phase ac motor is called the _____. **(rotor)**
304. The squirrel cage winding in a single phase induction motor is usually placed in the _____. **(rotor)**
305. In a single phase induction motor, the starting torque is _____. **(zero)**
306. For a given frame size and temperature rise the output of single phase motor is about _____ percent of that of 3-phase motor. **(50)**
307. The stator of a split-phase single phase induction motor is provided with _____ winding(s). **(2)**
308. The main winding and the auxiliary winding placed on the stator of a single phase induction motor are spaced _____ electrical degrees apart. **(90)**
309. _____ start single phase induction motor is commonly known as split-phase motor. **(resistance)**
310. The capacitor usually used in a capacitor-start induction motor is _____ type. **(electrolyte)**
311. _____ induction motors are in deed splendid machines and are used where the load requirements are severe. **(capacitor-start-capacitor-run)**
312. In a shaded pole motor the necessary phase splitting is produced by _____. **(induction)**
313. The shading coil employed in a shaded pole motor is highly _____. **(inductive)**
314. Armature reaction causes _____ in the speed of an ac series motor. **(rise)**
315. Repulsion motor has _____ efficiency in comparison to other single phase motors. **(high)**
316. _____ motor is split phase motor with properly designed salient poles and operates at synchronous speed. **(reluctance)**
317. The hysteresis motor rotor is made of magnetic material having _____ hysteresis loop area. **(large)**
318. A rotary convertor set is usually started from _____ side. **(ac)**
319. A rotary convertro is usually employed to convert _____ into _____. **(ac, dc)**
320. Most commonly used convertors are _____ phase. **(3)**
321. Rotary convertor has _____ commutators(s). **(one)**

322. A motor convertor is a single machine with _____ armature(s) and _____ field(s). **(1, 1)**
323. The number of slip-rings of a single phase and three-phase convertors are respectively _____ and _____. **(2,3)**
324. For a 3-phase, 6-pole synchronous convertor there will be _____ taps to the winding. **(nine)**
325. The magnitude of each of the voltage phasor represented by the sides of a regular hexagon is a 6-phase system produced by double-delta connection of the secondaries of transformr is _____ times the voltage of each secondary winding. **($1/\sqrt{3}$)**



CHAPTER - 10

KNOWLEDGE OF SPEED CONTROL AND REVERSING OF THE DIRECTION OF MOTORS

1. In Fleming's right - hand rule, the thumb points towards
 - a. direction of flux
 - b. direction of induced e.m.f.
 - c. direction of motion of conductor, if fore finger points along the lines of flux *
 - d. direction of motion of the conductor if for finger points in the direction of generated e.m.f.
2. The resistance of armature winding depends on
 - a. number of conductors
 - b. conductor length
 - c. cross - sectional area of the conductor
 - d. all of the above *
3. The output voltage of a simple d.c. generator is
 - a. a.c. square wave
 - b. a.c. sinusoidal wave
 - c. pure d.c.
 - d. pulsating d.c.*
4. When two generators are running in parallel and field of one of them is weakened too - much then it will
 - a. deliver large share of the total load
 - b. deliver small share of the total load *
 - c. run in the opposite direction
 - d. run as a motor in the same direction
5. If a shunt generator fails to build up any voltage at no - load, the reason may be that
 - a. there is no residual magnetism
 - b. field coil may be connected in reverse direction
 - c. its field resistance is more than the critical resistance
 - d. all or any one of the above *
6. In shunt generator interpole winding carries
 - a. armature current *
 - b. shunt field current
 - c. full load current
 - d. none of these
7. Due to which of the following reasons a separately excited generator as compared to a self - excited generator is better ?
 - a. is more stable
 - b. has exciting current independent of load current
 - c. is amenable to better voltage
 - d. has all above features *
8. Due to which of the following reasons, copper brushes in D.C. machine are used ?
 - a. when high voltage and small currents are involved
 - b. when low voltage and high currents are involved*
 - c. in both of the above cases
 - d. in none of the above cases
9. To maintain constant d.c. voltage at the consumers' terminals the generator used is
 - a. series generator
 - b. over compounded generator
 - c. under compounded generator
 - d. flat compound generator *
10. A four pole lap wound d.c. shunt generator is supplying 46 A to a load. The field current of the generator is 2A. The current per parallel path is
 - a. 12 A
 - b. 24 A *
 - c. 24 A
 - d. none of these
11. In a duplex wave winding with equalizers
 - a. both number of pole - pairs and number of slots are even *
 - b. number of pole - pairs is odd and number of slots is even
 - c. number of pole - pairs is even and number of slots is odd
 - d. both number of pole - pairs and number of slots are odd
12. What would be observed if a d.c. shunt motor is started with an open - circuited field ?
 - a. the motor picks up fast and acquires full speed while drawing small current
 - b. the motor picks up fast and acquires full speed while drawing large current
 - c. the motor does not pick up speed but draws a large current *
 - d. the motor does not pick up speed but draws a small current
13. When the series field is so connected that its ampere turns act in the same direction as those of shunt field, the generator is said to be
 - a. series generator *
 - b. shunt generator
 - c. cumulatively compound generator
 - d. differentially compound generator
14. What is the nature of the current flowing in the armature of a d.c. machine ?
 - a. pure d.c.
 - b. alternating *
 - c. pulsating d.c.
 - d. rectified a.c.
15. A D. C. welding generator has
 - a. wave winding
 - b. duplex winding
 - c. lap winding *
 - d. any of the above

16. In a D. C. generator, the armature reaction results in
 a. magnetisation of interpoles
 b. demagnetisation of the centres of poles
 c. magnetisation of the leading tip and demagnetisation of the trailing pole tip
 d. demagnetisation of the leading pole tip and magnetisation of the trailing pole tip *
17. Why is the armature of a d.c. machine made of silicon steel stampings ?
 a. to reduce eddy current loss *
 b. to reduce hysteresis loss
 c. for the ease with which the slots can be created
 d. to achieve high permeability
18. The critical resistance in a d.c. shunt generator is
 a. the value of field circuit resistance above which the generator would fail to excite *
 b. the value of field circuit resistance for which the generator no - load voltage equals the rated voltage
 c. the resistance of the field circuit
 d. the value of field circuit resistance below which the generator would fail to excite
19. Due to which of the following reasons a twelve pole, lap wound d.c. generator be preferred to four - pole lap wound d.c. generator ?
 a. low speed
 b. high speed
 c. higher voltage
 d. higher current output *
20. The armature coils of a d.c. machine are not made of aluminium, because
 a. aluminium is costly
 b. aluminium has low resistivity
 c. the thermal conductivity of aluminium is low
 d. the size of the machine will become more *
21. In lap winding resultant pitch is
 a. sum of front and back pitches
 b. difference of front and back pitches *
 c. division of front pitch by back pitch
 d. multiplication of front and back pitches
22. In an unsaturated D. C. machine armature reaction is
 a. magnetising b. demagnetising
 c. cross magnetising * d. none of above
23. Brushes of D. C. machines are usually made of
 a. hard copper b. soft copper
 c. carbon * d. all of the above
24. which of the following factors does not govern the iron losses in a D. C. machine ?
 a. load * b. voltage
 c. speed d. speed and voltage
25. In the output voltage of a d.c. generator the ripple effects can be reduced by increasing the
 a. field current
 b. number of armature coils *
 c. number of turns in the field winding
 d. size of the conductor of the armature coil
26. The armature core of a d.c. machine is usually made of laminated sheets in order to
 a. reduce hysteresis loss
 b. reduce armature copper losses
 c. reduce eddy current *
 d. increase its surface area for better dissipation of heat
27. Short circuited armature coil of a D. C. machine can be identified by
 a. a spark completely around the commutator
 b. the scanning of the commutator segment to which open circuited coil is connected
 c. both a. and b.*
 d. none of the above
28. The polarity of the interpoles in d.c. generator
 a. is neutral as these poles do not play part in generating e.m.f.
 b. is the same as that of the main pole ahead *
 c. is the same as that of the immediately preceding pole
 d. is opposite to that of the main pole ahead
29. With given power rating for lower current and higher voltage rating of a d.c. machine, one should prefer
 a. lap winding b. wave winding *
 c. none of these d. any of these
30. The compound generator is said to be flat compounded if the full load voltage is
 a. more than the no - load voltage
 b. less than the no - load voltage
 c. exactly half of the no - load voltage
 d. equal to no - load voltage *
31. A d.c. generator is run with different modes of field excitation keeping the no - load voltage constant at 250 V every time. The full - load voltages for the various connections are 250, 230, 215 and 180V. The machines have following modes of excitation respectively
 a. cumulative compound, separately excited, shunt and differential compound *
 b. cumulative compound, separately excited, differential compound and shunt
 c. separately excited, cumulative compound, shunt and differential compound
 d. cumulative compound, differential compound, separately excited and shunt
32. The decrease in terminal voltage of a shunt generator, from no - load to load condition is due to
 a. decrease in field current
 b. armature reaction
 c. armature resistance drop
 d. all of these *

33. Commutation in a d.c. generator causes
- d.c. changes to a.c.
 - d.c. changes to d.c.
 - a.c. changes to d.c.*
 - a.c. changes to high voltage d.c.
34. Consider the following statements regarding building up of voltage of a shunt generator
- there should be residual magnetism in the field system or build-up voltage
 - the field winding should be properly connected so that the current in the field winding produces flux in the same direction as that of residual magnetism
 - the resistance of the field winding should be less than the critical resistance corresponding to the speed of the machine
- only iii. has to be satisfied
 - only i. and ii. have to be satisfied
 - only i. and iii. have to be satisfied
 - all the above condition have to be satisfied *
35. In D. C. machines, lap winding is used for
- low voltage, low current
 - low voltage, high current *
 - high voltage, low current
 - high voltage, high current
36. Fractional pitch winding is used in d.c. machine
- to reduce sparking
 - to save the copper because of shorter end connections
 - to increase the generated voltage
 - due to a. and b. above *
37. The yoke of a d.c. machine is made up of
- copper - zinc alloy
 - insulating material
 - comparatively poor magnetic material *
 - very high permeability magnetic material
38. The commutator segments of a d.c. machine are usually made of
- carbon
 - iron
 - hard drawn copper *
 - stainless steel
39. The e.m.f. generated in the armature of d.c. generator is directly proportional to
- number of poles
 - speed of armature
 - flux / pole
 - all of the above *
40. In the armature, D.C. generator generates
- oscillating e.m.f.
 - a.c. voltage *
 - a.c. superimposed over d.c.
 - d.c. voltage
41. Internal characteristic of a generator is plotted between
- I_L and $(V + I_a R_a)$ *
 - I_a and load voltage, V
 - I_a and $(E - I_a R_a)$
 - none of these
42. The characteristic drawn between no-load generated e.m.f. and the field current is known as
- magnetising characteristic *
 - external characteristic
 - internal characteristic
 - total characteristic
43. Which type of d.c. generator is used to charge the batteries ?
- shunt generator *
 - series generator
 - long shunt compound generator
 - any of the above
44. D. C. series generator application is limited to
- act as a booster to maintain constant voltage at the load end of the feeder *
 - supply fraction load
 - supply industrial load at constant voltage
 - for none of the above purpose
45. If the number of poles in a wave wound generator is doubled then the generated emf will
- become half
 - become double *
 - increase to four times
 - remain constant
46. If the number of poles in a lap wound generator be doubled, then the generated emf will
- become half
 - become double
 - increase to four times
 - remain constant *
47. Which of the following d.c. generator can build up without any residual magnetism in the poles ?
- compound generator
 - separately - excited generator *
 - series generator
 - shunt generator
48. In a D.C. generator the actual flux distribution depends upon
- shape of the pole shoe
 - size of air gap
 - clearance between tips of the adjacent pole shoes
 - all of the above *
49. If column A represents D.C. machines operating on unsaturated region and column B represents machine operating in saturated region, upon loading on the machine what will happen for flux / pole ?
- | Column - A | Column - B |
|---------------------------------------|------------------------------------|
| a. remains constant | decreases * |
| b. first decreases and then increases | remains constant |
| c. decreases | remains constant |
| d. increases | first decreases and then increases |

50. In Ward Leonard control, the d.c. motor is
 a. shunt motor *
 b. series motor
 c. separately excited motor
 d. compound motor
51. If the voltage at a d.c. shunt motor terminal is halved, load torque being constant the armature current will be
 a. halved
 b. doubled *
 c. unaltered
 d. zero
52. Magnetic field in a D.C. generator is produced by
 a. permanent magnets
 b. electromagnets *
 c. both a. and b.
 d. none of the above
53. The polarity of a D.C. generator can be reversed by
 a. increasing field current
 b. reversing the field current *
 c. reversing field current as well as direction of rotation
 d. any of the above
54. Which of the following figures (Fig. 1) represents load characteristics of a differentially compounded generator ?

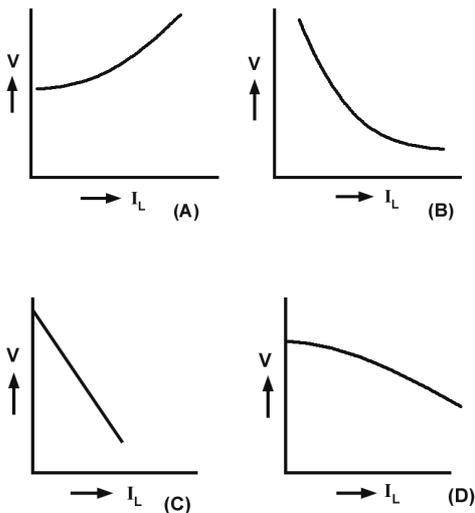


Fig. 1

- a. Fig. A
 b. Fig. B
 c. Fig. C.
 d. Fig. D.*
55. Which of the above figure (Fig. 1) represents load characteristics of over compounded generator ?
 a. Fig. A.*
 b. Fig. B.
 c. Fig. C.
 d. Fig. D.
56. In a d.c. machine, interpoles are used to
 a. generate more e.m.f. in the armature
 b. avoid interference of the armature flux with the main flux
 c. increase the demagnetising effect of armature reaction
 d. neutralise the effect of armature reaction in the interpole region *
57. What is generally used to control the output voltage of a d.c. generator
 a. speed
 b. load current
 c. excitation *
 d. armature current
58. In D.C. generators, current to the external circuit from armature comes out from
 a. slip rings
 b. commutator
 c. brush connection *
 d. none of the above
59. The material for commutator is generally
 a. carbon
 b. mica
 c. copper *
 d. cast iron
60. For sparkless commutation the armature reaction effect in a d.c. machine is neutralised by
 a. increasing the field excitation
 b. using compensating winding and commutating poles *
 c. fixing the brush axis in alignment with the interpole axis
 d. shifting the brush axis from GNA to MNA
61. The sparking at the brushes of a d.c. generator is due to
 a. reactance voltage *
 b. light load
 c. armature reaction
 d. high resistance of the brushes
62. Compensating windings are used in D.C. generators
 a. to provide path for the circulation of cooling air
 b. to neutralise the cross - magnetising effect of the armature reaction *
 c. mainly to reduce the eddy currents by providing local short circuits
 d. none of the above
63. While pole flux remains constant, if the speed of the generator is doubled, the e.m.f. generated will be
 a. half
 b. twice *
 c. nominal value
 d. slightly less than nominal
64. What type of compounding would be desirable in the d.c. generator feeding a long transmission line ?
 a. over compounding *
 b. under compounding
 c. flat compounding
 d. any one of above
65. Which would have the highest percentage of voltage regulation ?
 a. series generator
 b. shunt generator *
 c. compound generator
 d. separately excited generator
66. The ripples in a D.C. generator are reduced by
 a. using equaliser rings

- b. using conductor of annealed copper
- c. using carbon brushes of superior quality
- d. using commutator with large number of segments*

67. Parallel operation of two or more D.C. compound generators, is possible provided
- a. polarity of incoming generator is same as that of bus bar
 - b. all the series fields run in parallel by means of equalizer connection
 - c. series fields of all generators are either on positive side or negative side of the armature *
 - d. voltage of the incoming generator is same as that of bus bar

68. Which curve represents the Torque - current characteristics for a series motor (Fig. 2) ?
- a. A.
 - b. B.
 - c. C. *
 - d. D.

69. A. Which curve of the fig. 2 represents the Torque - current characteristics of a shunt motor ?

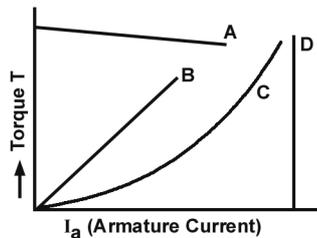


Fig. 2

- a. C
- b. A *
- c. D
- d. B

70. The speed of a d.c. motor may be varied by varying
- a. applied voltage
 - b. field current
 - c. resistance is series with armature
 - d. any of the above *

71. Which of the following speed control methods of d.c. motor require auxiliary motor ?
- a. flux control *
 - b. armature control
 - c. voltage control
 - d. ward-leonard control

72. The efficiency of a d.c. machine is maximum when
- a. variable losses are equal to constant losses
 - b. stray losses are equal to copper losses
 - c. field copper losses are equal to armature copper losses *
 - d. magnetic losses are equal to windage loss

73. Compensating winding in a d.c. machine is connected
- a. in series of interpole winding
 - b. in series of field winding
 - c. in series of armature winding *
 - d. directly across the supply

74. Mark the correct statement below in respect of armature control of a d.c. shunt motor :

- a. increase in armature voltage increases motor speed and also the full-load torque capability of the motor
- b. increase in armature voltage decreases motor speed while the full-load torque capability is unaffected
- c. increase in armature voltage (with fixed current) increases motor speed while the full-load torque capability of the motor remains unaffected
- d. increase in armature voltage decreases motor speed and also the full-load torque capability of the motor*

75. In a D.C. generator probable cause of failure to build up voltage is
- a. imperfect brush contact
 - b. no residual magnetism in the generator due to faulty shunt connections
 - c. field resistance higher than the critical resistance*
 - d. all of the above

76. The critical resistance of a d.c. generator refers to the resistance of
- a. load
 - b. brushes *
 - c. field
 - d. armature

77. The efficiency of a d.c. shunt generator becomes maximum when the
- a. stray losses are equal to constant losses *
 - b. armature copper losses are equal to constant losses
 - c. magnetic losses are equal to mechanical losses
 - d. field copper losses are equal to constant losses

78. Series field resistance of a d.c. series generator is about
- a. 0.1Ω *
 - b. 2.5Ω
 - c. 10Ω
 - d. 200Ω

79. Which of the following d.c. motor has approximately constant speed ?
- a. shunt motor *
 - b. series motor
 - c. cumulatively compound motor
 - d. all of the above

80. If the supply voltage in a shunt motor is increased, which of the following will decrease ?
- a. full load current
 - b. full load speed
 - c. starting torque
 - d. none of these *

81. Why the armature winding coils of a d.c. machine are place in number of slots around the periphery, instead of placing them in only two slots ?
- a. to make the armature balanced
 - b. to have minimum heat dissipation from the armature
 - c. to get sinusoidal e.m.f. at the output terminals of the machine
 - d. to get maximum generated e.m.f. at the output terminals of the machine
 - d. to get maximum generated e.m.f. in the armature *

82. Which device changes the alternating e.m.f. generated by the d.c. generator, in its armature coil, to d.c. ?

- a. slip ring * b. rectifier
c. rotary convertor d. commutator
83. If the d.c. series motor is started at no load, it will
a. run at very high r.p.m.*
b. run with excessive noise
c. burn out
d. not start
84. Two series motors are mechanically coupled. One machine is run as motor and the other as generator. The iron and friction losses of the machines will be identical when
a. their speeds and excitations are identical
b. their speeds are equal and back emfs are half the supply voltage
c. their ratings and armature sizes are identical *
d. their speeds are identical
85. In the block diagram of a separately excited d.c. motor, the armature induced e.m.f. appears as :
a. disturbance input b. positive feedback
c. negative feedback * d. output
86. The most economic method of electrical braking is
a. plugging *
b. dynamic braking with self excitation
c. regenerative braking
d. dynamic braking with separate excitation
87. A shunt generator supplies 9A of load current at 400 V. If its armature resistance is 1Ω and field current is 1 A, then the generated e.m.f. will be
a. 400 Volts b. 409 Volts
c. 410 Volts d. none of these *
88. Stray losses in d.c. machine are
a. windage loss * b. magnetic losses
c. mechanical losses d. all of these
89. Which of the following statement is true while starting a d.c. shunt motor :
a. reduced armature voltage but full field voltage should be applied and all regulator resistance should be cut out in the field circuit
b. rated armature and rated field voltage should be applied and full regulator resistance should be included in the field circuit *
c. reduced armature voltage and reduced field voltage should be applied and full regulator resistance should be included in the field circuit
d. rated armature and rated field voltage should be applied and full regulator resistance should be cut out on the field circuit
90. Which of the following type of d.c. motor is least used?
a. series motor
b. differentially compound motor
c. permanent *
d. cumulative compound motor
91. Which of the following parts of a d.c. motor can sustain the maximum temperature rise ?
a. slip rings b. commutator
c. field windings * d. armature windings
92. In a d.c. machine constant losses composed of
a. mechanical losses
b. commutator losses
c. iron losses and mechanical losses
d. total copper losses of the machine *
93. In a d.c. machine variable losses are composed of
a. iron losses
b. mechanical losses
c. shunt field copper losses *
d. armature copper losses
94. If the resistance of the field winding of a D.C. generator is increased, the output voltage will
a. fluctuate heavily b. remain unaffected
c. increase d. decrease *
95. Which of the following D.C. generators can build up without any residual magnetism in the poles ?
a. compound generator
b. shunt generator *
c. series generator
d. separately excited
96. Brushes in d.c. machines are always placed along
a. geometrical neutral axis (GNA)
b. magnetic neutral axis (MNA) *
c. both a. and b. are correct
d. separately excited
97. Brushes used in d.c. machines are generally made of
a. steel b. carbon
c. brass * d. copper
98. In a flat compound D.C. generator
a. speed varies in direct proportion to the load on the generator
b. voltage generated reduces with load *
c. voltage remains constant irrespective of the load
d. generated voltage is inversely proportional to the load on the generator
99. Over compounding of d.c. generator, leads the full load terminal voltage to
a. be less than no-load terminal voltage
b. be more than no - load terminal voltage *
c. be equal to no - load terminal voltage
d. almost zero
100. A d.c. motor is running with a certain load. The effect of adding an external resistance in the shunt field circuit, load being constant, is
a. to stop the motor
b. to increase the motor speed *
c. to reduce the motor speed
d. to reduce armature current of motor

101. A d.c. shunt motor is running at a particular speed, it is desired to reverse its direction of rotation. This can be achieved by
- providing reactifier
 - reversing the field connections
 - reversing the connections of the supply *
 - reversing the connections of field winding and armature
102. In the commutation process
- voltage is reversed
 - current is reversed in the field coil
 - current is reversed in the armature coil undergoing commutation
 - both armature current and voltage are reversed *
103. A 250 V, d.c. shunt generator has a voltage regulation of 8%. The voltage at no-load will be
- 230 volts
 - 250 volts
 - 258 volts *
 - 270 volts
104. In which of the following tests on d.c. machines minimum number of two machines are required ?
- brake test
 - Retardation test
 - Back to back test *
 - Swinburne's test
105. Hopkinson's test is conducted at
- low load *
 - part load
 - full load
 - no load
106. The load current of a d.c. series motor is 50 A, when supplying a full load torque. If the current is reduced to 25 A, the torque will be
- 25% of full load torque
 - 50% of full load torque
 - 150% of full load torque *
 - same as full load torque
107. What is the function of commutator of the d.c. motor?
- to reduce friction
 - to convert a.c. into d.c.
 - to convert d.c. into a.c.
 - to feed the current to the armature *
108. Which of the following loads normally start at rated torque ?
- cranes
 - centrifugal pumps
 - industrial blowers
 - conveyors and printing presses *
109. A punching machine, having intermittent light and heavy loads, should have
- shunt motor
 - series motor
 - differentially compound motor
 - cumulatively compound motor *
110. The flux set up by the armature current has
- magnetizing effect
 - cross magnetizing effect *
 - demagnetizing effect
 - b. and c. both
111. The voltage between commutator segments should not exceed than
- 2 volts
 - 15 volts
 - 50 volts *
 - 200 volts
112. In Hopkinson's test for d.c. motors
- speeds of the motors are separately controlled
 - both motors are run as generators
 - both machines are mechanically coupled *
 - both motors run at their respective rated speeds
113. In Ward Leonard control change in speed of motor can be obtained by varying
- supply voltage of the d.c. motor *
 - field excitation of d.c. motor
 - armature voltage of d.c. motor
 - armature current of d.c. motor
114. On increasing the load on d.c. series generator its terminal voltage will
- increase
 - decrease slightly
 - decrease sharply
 - remain same *
115. What is the flux in the armature core section of a d.c. machine if the air gap flux be ϕ ?
- ϕ
 - 0.1ϕ
 - 1.5ϕ *
 - $\phi / 2$
116. Full load speed of a d.c. motor being 1000 r.p.m., and speed regulation being 90%, no load speed will be
- 900 r.p.m.
 - 1000 r.p.m.
 - 1110 r.p.m. *
 - 1200 r.p.m.
117. Yoke of a d.c. generator is made of
- wood
 - copper
 - cast iron
 - aluminium *
118. In a d.c. shunt motor, running at light load, if the field winding gets opened, what will happen ?
- motor will stop instantly
 - motor will take heavy input current *
 - motor will make mechanical noise
 - motor will tend to pick up high speed
119. A d.c. series motor
- always runs at constant speed
 - should always be started on load *
 - may stop if the field gets opened
 - is not suitable for high starting torque
120. Conventional exciter of a turbo generator is basically
- series generator
 - shunt generator
 - compound generator *
 - separately excited generator
121. Full load terminal voltage in a level compounded d.c. generator is

- a. less than no load terminal voltage
 - b. more than no load terminal voltage *
 - c. equal to no - load terminal voltage
 - d. negligibly low
122. Which of the following components is a must for d.c. motor ?
- a. armature *
 - b. commutator
 - c. slipping
 - d. type of winding
123. Which type of d.c. motor is preferred for cranes and hoists ?
- a. series motor
 - b. shunt motor
 - c. cumulatively compound motor
 - d. any of the above *
124. The essential condition for parallel operation of two d.c. generators is that they should have
- a. the same r.p.m.
 - b. same kW rating
 - c. same percentage regulation *
 - d. the same drooping voltage characteristics
125. Which of the following regulation is preferred for d.c. generator ?
- a. 50 % regulation
 - b. 100 % regulation *
 - c. very low regulation
 - d. infinite regulation
126. Armature resistance of a d.c. machine is about
- a. 0.1Ω
 - b. 2.5Ω
 - c. 200Ω *
 - d. none of these
127. The resistance of shunt winding of a d.c. machine may be about
- a. 0.1Ω
 - b. 1Ω
 - c. 250Ω *
 - d. none of these
128. In shunt motor armature current is equal to
- a. load current
 - b. the sum of motor current and field current
 - c. the difference of motor current and field current
 - d. both, motor and field current
129. A series motor has
- a. widely varying speed
 - b. approximately constant speed at all loads
 - c. low speed at high loads and high speed at low loads *
 - d. high speed at high loads and low speed at low loads
130. Speed regulation in a d.c. motor is given by
- a. $\frac{\text{No load speed}}{\text{Full load speed}}$
 - b. $\frac{\text{Highest speed}}{\text{Lowest speed}}$

- c. $\frac{\text{No load speed} - \text{Full load speed}}{\text{Full load speed}}$ *
- d. $\frac{\text{Full load speed}}{\text{No load speed} - \text{Full load speed}}$

131. What is the current drawn by a 220 V d.c. motor of armature resistance 0.5Ω and back e.m.f. 200 V ?
- a. 4 A
 - b. 20 A
 - c. 40 A *
 - d. 110 A
132. Which numbered characteristics as shown in the fig. 3 shows load characteristic of a shunt generator

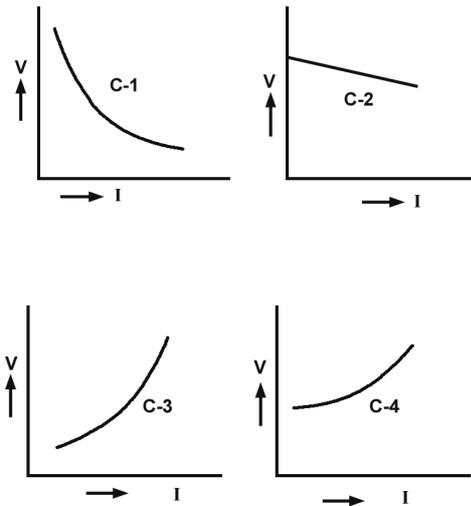


Fig. 3

- a. C - 1
 - b. C - 3
 - c. C - 2 *
 - d. C - 4
133. On which of the following principle does the d.c. motor work ?
- a. cork screw rule *
 - b. right hand thumb rule
 - c. Fleming's left hand rule
 - d. Fleming's right hand rule
134. For a series motor magnetic field flux is
- a. directly proportional to the current
 - b. constant at all value of armature current
 - c. inversely proportional to the field current
 - d. inversely proportional to the armature current *
135. During parallel operation of two d.c. generators, an equalizer bar is used
- a. to increase the series flux *
 - b. to increase the speed and hence generate e.m.f.
 - c. to reduce the combined effect of armature reaction of both machines
 - d. so that two similar machines will pass approximately equal currents to the load
136. If residual magnetism is not present in a d.c. generators, the induced e.m.f. at zero speed

- a. zero
- b. unpredictable
- c. 10% of rated voltage *
- d. the same as rated voltage

137. Which figure of the (Fig. 4) represents the speed torque characteristics of a d.c. shunt motor

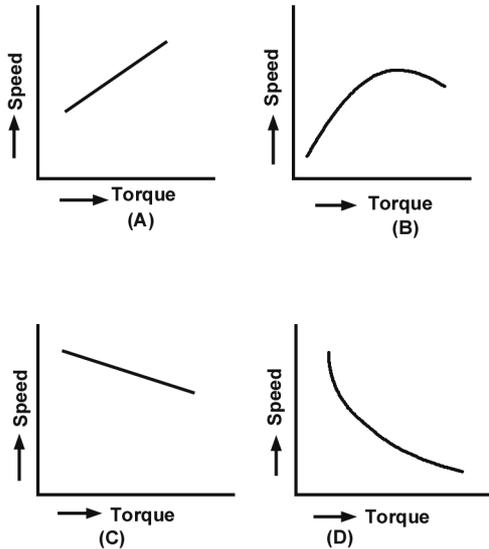


Fig. 4

- a. Fig. A
- b. Fig. B *
- c. Fig. C
- d. Fig. D

138. The armature resistance of a 200 V d.c. machine has 0.5 ohm. If the full load armature current is 50 A, what will be the induced e.m.f. when, the machine acts as (i) generator (ii) motor will be

- a. 230 V, 170 V *
- b. 210 V, 190 V
- c. 225 V, 175 V
- d. 202.5 V, 197.5 V

139. A dc machine is required to rotate in both directions. The brush should be

- a. on g.n.p.
- b. ahead of g.n.p. *
- c. shifted backward
- d. any of the above

140. Which motor will have least percentage increase of input current for the same percentage increase in torque?

- a. shunt motor
- b. series motor
- c. cumulatively compound motors
- d. separately excited motor *

141. D.C. generator works on the principle of

- a. Ohm's law
- b. Lenz's law
- c. Fleming's left hand rule *
- d. Faraday's law of electromagnetic induction

142. Which D.C. generator will be preferred for parallel operation ?

- a. series generators
- b. compound generators

- c. shunt generators
- d. none of the above *

143. For a given torque, reduction of the field turns of a d.c. series motor

- a. increases its speed but armature current remains the same
- b. decreases its speed, armature current remains the same
- c. decreases its speed, demanding less armature current *
- d. increases its speed, demanding more armature current

144. In Hopkinson's test on the identical d.c. shunt motors:

- a. iron loss in the motoring machine is more than that in the generating machine
- b. only stray-load components of iron loss in both machines are equal
- c. iron loss in the generating machine is more than that in the motoring machine *
- d. iron losses in both machines are equal

145. The speed current characteristic of a d.c. series motor is

- a. straight line, starting from origin
- b. straight line, not starting from origin
- c. rectangular hyperbola in shape
- d. none of the above *

146. The value of the back e.m.f., when the d.c. motor is at rest is

- a. less than the supply voltage
- b. greater than the supply voltage
- c. equal to the supply voltage
- d. zero *

147. Which is the type of enclosure for motors used in moist dirty atmosphere ?

- a. drip proof
- b. open type *
- c. screen protected
- d. totally enclosed fan cooled

148. Commutator segments of a d.c. motor are made of

- a. Mica *
- b. Copper
- c. Cast Iron
- d. Stainless steel

149. Which of the following d.c. generator will offer constant voltage at any load ?

- a. level compounded generator
- b. self - excited generator
- c. separately excited generator *
- d. all of the above

150. Which of the following effects is observed for armature reaction in a d.c. generator ?

- a. magnetising the centre of all poles *
- b. demagnetising the centre of all poles
- c. demagnetisation of leading pole tip and magnetisation of trailing pole tip

- d. demagnetisation of trailing pole tip and magnetisation of leading pole tip
151. In d.c. shunt motors if the load is increased the speed of the motor
- reduces slightly
 - increases slightly
 - remains unaltered
 - increases in proportion to the increase in load *
152. For which of the following application, a d.c. motor is preferred over an a.c. motor ?
- high speed operation *
 - low speed operation
 - fixed speed operation
 - variable speed operation
153. In a d.c. shunt generator, terminal voltage drops on load because of all of the following reasons except
- commutation
 - armature reaction
 - armature resistance drop
 - field weakening due to armature reaction *
154. A shunt generator can self-excite provide
- irrespective of the value of the resistance in the field circuit
 - provided dummy coils are present in pole shoe *
 - only if the resistance of the field circuit is greater than critical value
 - only if the resistance of the field circuit is less than critical value
155. After saturation the torque-current characteristic curve of a d.c. series motor becomes a
- parabola
 - straight line *
 - rectangular hyperbola
 - none of the above
156. On loading, the speed of a d.c. series motor
- increases
 - decreases *
 - remains same
 - becomes zero
157. In a separately excited generator supplying rated load the armature reaction
- may be sometimes present
 - is always present
 - is always absent
 - none of the above *
158. A series generator can self - excite provided
- speed is low
 - interpole is present
 - the load current is zero
 - the load current is not zero *
159. If the field flux of d.c. shunt motor approaches zero,
- the motor will stop
 - the motor speed will approach zero
 - motor speed will remain unchanged
 - the motor speed will tend to rise at infinite speed *
160. Ward Leonard method of speed controls provides speed control
- above rated speed
 - below rated speed
 - in one direction only *
 - in both directions
161. Which of the following statements is incorrect in d.c. shunt generators ?
- hysteresis loss depends upon the supply frequency *
 - hysteresis loss is independent of lamination thickness
 - hysteresis loss can be minimized by laminating the armature
162. In d.c. generators, the brushes remain in
- the inter - polar axis
 - under south pole *
 - under north pole
 - none of the above position
163. The function of the brushes and the commutator in a d.c. motor is to
- reduce sparking *
 - produce unidirectional torque
 - help in changing the direction of rotation of the armature
 - produce unidirectional current in the armature
164. Which of the following motor gives high starting torque
- series motor *
 - shunt motor
 - compound motor
 - all these
165. Change of d.c. excitation of shunt motor changes
- motor speed
 - direction of rotation of the motor
 - applied voltage to the motor
 - none of these *
166. The resistance of an armature of a d.c. motor may be
- about 0.01Ω *
 - about 250Ω
 - more than $1 \text{ k}\Omega$
 - less than one ohm
167. How the drop in speed in a d.c. generator due to increase in load can be compensated
- by increasing the input to the prime mover
 - by increasing the armature resistance
 - under - compound *
 - flat - compound
168. Which one of the following types of generators does not need equalizers for satisfactory parallel operation?
- series *
 - over - compound
 - under - compound
 - flat - compound
169. Which of the following motors should not be used for centrifugal pumps

- a. series
b. shunt
c. differentially compound
d. cumulating compound *
170. Which of the following tests can be used to measure stray losses of a d.c. motor ?
a. Field's test
b. Brake test
c. Swinburne's test *
d. Running down test
171. The torque developed in a d.c. motor is 100 Nm at 1000 r.p.m. If the motor now runs at 800 r.p.m., the torque developed will be
a. 71 N-m
b. 80 N-m *
c. 100 N-m
d. 120 N-m
172. In a d.c. motor, the speed is
a. constant
b. directly proportional to back e.m.f.
c. directly proportional to field flux
d. inversely proportional to the product of back emf and flux *
173. In d.c. machine, there are as many commutator bars as the number of
a. poles *
b. slots
c. armature conductors
d. winding elements
174. Shunt field of a compound generator being connected across both the series field and armature, the connection is known as
a. long shunt
b. short shunt
c. differential compounding
d. cumulative compounding *
175. If the supply terminals for a d.c. shunt motor are reversed, what will be the effect on the motor ?
a. it will stop
b. it will burn *
c. it will run as a d.c. generator
d. it will not run in reverse direction
176. Which of the following tests can be conducted on all types of d.c. machines of lower rating ?
a. Field's test *
b. Brake test
c. Running down test
d. Swinburne's test
177. A simple method of increasing the voltage of a d.c. generator is
a. to increase to speed of rotation
b. to decrease the speed of rotation *
c. to increase the length of the armature
d. to decrease the length of the armature
178. In d.c. generator the change in voltage when the load is reduced from rated value to zero, expressed as a percentage of rated load voltage, is known as
a. loss factor
b. regulation
c. efficiency *
d. armature reactance
179. A d.c. shunt motor is running at its rated speed, suddenly the field winding gets open
a. its speed decreases slowly
b. motor will stop immediately
c. motor speed becomes momentarily high and then it reduces to zero *
d. motor speed becomes momentarily high and then it will be running at normal speed
180. No volt release coil of d.c. shunt motor starter is connected in series with the
a. line
b. series winding
c. shunt field winding *
d. armature winding
181. Small air gap between stator and armature
a. reduces noise
b. provides high ventilation
c. provide stronger magnetic field
d. facilitate high speed operation *
182. No load losses of a shunt motor can be determined by
a. Brake test
b. Retardation test
c. Hopkinson's test
d. Swinburne's test *
183. A d.c. shunt motor is supplying a load at its rated speed. Its speed can be decreased by
a. using field regulator
b. increasing the supply voltage
c. adding an external resistance in the field circuit
d. connecting additional resistance in series of the armature *
184. The direction of rotation of a d.c. shunt motor can be reversed by interchanging
a. the field terminals only
b. the supply terminals
c. the armature terminals only
d. either field or armature terminals *
185. Once the residual magnetism of a shunt generator is lost accidentally, it may be restored connecting its shunt field
a. to earth
b. to an alternator
c. in reverse *
d. to a external battery
186. Which generator fails to build up voltage if there is no residual magnetism?
a. separately excited generator *
b. series generator
c. shunt generator
d. all of the above
187. Two d.c. series motors are coupled. The first one is run as generator and the other as motor. The friction losses of the two machines will be equal when
a. both have same speed

- b. both have same excitation
 c. both operate at same voltage
 d. both have same back e.m.f. *
188. For a cumulatively compounded d.c. motor, speed control can be effected through
 a. change of field resistance *
 b. change of armature resistance
 c. change of armature voltage
 d. any of the above
189. The series field of a short - shunt d.c. generator is excited by
 a. load current b. shunt current *
 c. external current d. armature current
190. If the no load voltage of a certain generator is 220 V and the rated voltage is 200 V, then the voltage regulation is nearly
 a. 0% b. 10%
 c. 15% * d. 20%
191. The speed of a d.c. shunt motor can be increased above its rated speed by
 a. increasing the supply voltage
 b. increasing the flux per pole
 c. using field regulator
 d. connecting additional resistance in series of the armature *
192. In d.c. machines, the armature windings are placed on the rotor because of the necessity for
 a. commutation
 b. generation of voltage
 c. development of torque
 d. electromechanical energy conversion *
193. An ideal d.c. generator has a regulation of
 a. 20% b. 70%
 c. 90% * d. zero %
194. What is the number of armature parallel paths in a 4 pole d.c. generator having duplex lap winding ?
 a. 2 * b. 4
 c. 8 d. 16
195. Which of the d.c. generators has poorest voltage regulation
 a. series b. compound
 c. shunt d. over - compound *
196. Shunt generators are most suitable for stable parallel operation because of their
 a. linear voltage characteristics
 b. rising voltage characteristics
 c. identical voltage characteristics *
 d. slightly drooping voltage characteristics
197. A 220 V d.c. motor has an armature resistance of 0.4 ohm. If the full load armature current is 10 and the no load armature current is 2A, the change in back e.m.f. from no load to full load will be
 a. 1.5V b. 2V
 c. 3.2V d. 6.4 V *
198. The approximate brush voltage drop in d.c. motors is in the order of
 a. 100V b. 50V
 c. 20 V * d. 2V
199. Why the armature coils of a d.c. machine are not made of aluminium?
 a. as it is costly
 b. as the thermal conductivity of aluminium is low *
 c. as the size of the machine will become more
 d. because aluminium has low resistivity
200. A shunt motor has
 a. widely varying speed *
 b. approximately constant speed at all loads
 c. high speed at high load and low speed at low load
 d. very low speed at high load and high speed at low load
201. In d.c. machine the brushes are placed on
 a. M.N.P. b. G.N.P.
 c. any of a. and b.* d. none of these
202. The e.m.f. induced in the armature of a d.c. motor is
 a. less than 220 volts
 b. more than supply voltage
 c. less than the supply voltage *
 d. equal to the supply voltage
203. A sinusoidal voltage of f_1 Hz (low value) is applied to the field of a shunt generator. The armature voltage wave
 a. will be of f_1 Hz b. will be of (N/f_1) Hz
 c. will be $f_1 \times N$ Hz * d. will be zero
204. Wave winding is composed of
 a. any odd number of conductors
 b. any even number of conductors
 c. that even number which is exact multiple of poles + 2 *
 d. the even number which is exact multiple of poles
205. Shunt motor starter resistance is connected in series with
 a. line *
 b. shunt field winding
 c. armature field winding
 d. all of these
206. A 500 V, shunt motor takes a current of 10 A at certain load. If its armature resistance is 1Ω , then the back e.m.f. at this load will be
 a. 490V b. 500V
 c. 510V d. none of these *

207. The open circuit voltage of a over-compound generator is 250 V. At full load the terminal voltage
- will always be 250 V
 - will be less than 250 V *
 - may be more or less than 250 V
 - may be greater than 250 V
208. Armature coil is short - circuited by brushes when it lies
- along field axis
 - along neutral axis
 - in any of the above positions
 - in none of the above positions *
209. By varying the armature circuit resistance the speed of a d.c. motor can be varied. The motor then becomes
- variable power drive
 - variable torque drive
 - constant power drive
 - constant torque drive *
210. Which of the following methods is most effective in finding out the no load losses in a large d.c. shunt motor?
- Leonard test
 - Block rotor test *
 - Hopkinson's test
 - Swinburne's test
211. The starting torque of a d.c. series motor is
- less than the starting torque of the shunt motor *
 - more than the starting torque of the shunt motor
 - equal to the starting torque of a shunt motor
 - equal to zero
212. Which of the following motor is used to drive the constant speed fans and lathes
- d.c. shunt motor
 - a.c. series motor
 - d.c. series motor
 - cumulative compound motor *
213. A d.c. series motor should not be started without some mechanical load on its because
- load on the motor acts as a brake
 - at no load motor gives vicious sparking *
 - at no load, losses in a series motor are high
 - a series motor develops infinite speed at no load
214. Power developed by a d.c. motor is maximum when the ratio of back e.m.f. / applied voltage is
- unity
 - half
 - double *
 - zero
215. The e.m.f. generate by a d.c. motor, running at N r.p.m. having P poles and Z armature conductors, will be
- $\frac{\phi Z N}{60}$ *
 - $\frac{\phi Z N P}{60}$
 - $\frac{\phi Z N P}{60A}$
 - none of these
216. The starting current of a d.c. motor is given by
- $\frac{V}{R_a}$ *
 - $\frac{E_b}{R_a}$
 - $\frac{V - E_b}{R_a}$
 - $\frac{E_b - V}{R_a}$
217. Stray loss in a d.c. machine is the sum of
- iron loss and mechanical loss
 - copper loss and mechanical loss
 - field copper loss and mechanical loss *
 - armature copper loss and iron loss
218. Which of the following may constitute short - circuit in the armature winding ?
- insulator failure between two commutator segments
 - inter turn insulation failure
 - a. and or b.
 - loss of residual magnetism *
219. Which of the following equipments require high starting torque ?
- crane *
 - reciprocating pumps
 - electric locomotives
 - all of the above
220. The efficiency of d.c. motor for maximum power transfer will be
- 50%
 - 80% *
 - 90%
 - 100%
221. Which of the following generator do not have terminal voltage while running on no-load under healthy condition
- shunt generator
 - series generator
 - separately excited generator *
 - compound generator
222. To achieve sparkless commutation, brushes of a d.c. generator are shifted ahead so as to bring them
- axis
 - in magnetic neutral axis
 - just ahead of magnetic neutral axis
 - just behind the magnetic neutral *
223. For which of the following applications d.c. motors are considered as most suitable ?
- Water pumps *
 - fans
 - Floor mills
 - Traction
224. In a d.c. series motor, speed
- increase as flux decreases
 - is controlled by shunt field
 - increases as armature circuit resistance increases
 - cannot be controlled by using diverter resistance*

225. Following controls are common for d.c. motors

- I. Control of flux
- II. Armature resistance control
- III. Supply voltage control

which of the above controls is most effective in the speed control of d.c. motors below and above the rated speed

- a. I only *
- b. II and III
- c. I and III
- d. III only

226. In which of the following braking, the terminal polarities are reversed during braking ?

- a. plugging
- b. regenerative
- c. rheostatic *
- d. dynamic

227. Number of toppings for each equalizer ring is equal to

- a. number of poles
- b. number of parallel paths
- c. number of pole pairs *
- d. number of commutator segments

228. In d.c. generators, at no -load, the air gap flux distribution in space is

- a. pulsating
- b. sinusoidal
- c. flat topped
- d. triangular *

229. In a d.c. motor back emf depends upon

- a. speed of the machine
- b. strength of the magnetic field
- c. numebr of armature conductors *
- d. all of these

230. The expression for the armature torque of a d.c. shunt motor is

- a. $T = 0.0159\phi ZI_a \frac{P}{A} \text{ kg - m}$
- b. $T = 0.159\phi ZI_a \frac{P}{A} \text{ N - m}$
- c. both a. and b. are correct *
- d. none of these are correct

231. The lower limit of speed in Ward Leonard control is imposed by

- a. bearing limits *
- b. stray losses of motor
- c. residual magnetism of the generator
- d. all of the above

232. Regenerative braking of shunt motors is commonly used when

- a. speed regulation is negative
- b. the load also acts as a braking force
- c. the load is reciprocating
- d. the load is constantly decreasing *

233. When a d.c. series motor is connected to an a.c. supply, then

- a. it will stop
- b. it may burn out

c. it will run without any trouble

d. it will run with less efficiency and high sparks at commutator *

234. The armature current of a d.c. motor is given by ($E_b =$ back emf)

- a. $I_a = \frac{V - R_a}{E}$
- b. $I_a = \frac{R_a - E}{V}$
- c. $I_a = \frac{V - E}{R_a}$
- d. $I_a = \frac{V + E}{R_a} *$

235. The condition for maximum power is

- a. supply voltage = Back e.m.f.
- b. supply voltage = $\sqrt{2} \times$ Back e.m.f.
- c. back e.m.f. = $(1/\sqrt{2}) \times$ supply voltage *
- d. back e.m.f. = $\frac{1}{2} \times$ supply voltage

236. Which of the following characteristics does represent the efficiency of a d.c. motor (Refer Fig. 5)

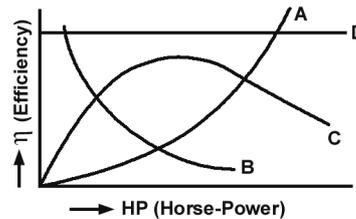


Fig. 5

- a. Ch. A *
- b. Ch. B
- c. Ch. C
- d. Ch. D

237. The speed of a d.c. series motor at no - load will be equal to

- a. infinite
- b. its normal speed *
- c. less than its normal speed
- d. zero

238. What is the standard direction of rotation of a commercial motor ?

- a. clockwise *
- b. anti - clockwise
- c. both a. and b.
- d. none fo these

239. In a shunt generator the voltage builds up till constrained by

- a. saturation of iron
- b. speed limitation *
- c. armature heating
- d. insulation restrictions

240. A cumulatively compounded long shunt generator when operating as a motor would be

- a. differentially compounded short shunt *
- b. differentially compounded long shunt
- c. cumulatively compounded long shunt
- d. cumulatively compounded short shunt

241. At light load the torque - current characteristic curve of a d.c. series motor is a
 a. parabola
 b. straight line
 c. rectangular hyperbola
 d. any one of the above *
242. The torque developed in the d.c. machine depends upon
 a. speed
 b. field flux
 c. armature current
 d. both b. and c.*
243. The rapid wear of brushes takes place due to
 a. excessive spring pressure *
 b. rough commutator bars
 c. high mica insulation between commutation bars
 d. all of the above factors
244. A shunt generator running at 1000 r.p.m. has generated e.m.f. as 100 V. If the speed increases to 1200 r.p.m., the generated e.m.f. will be nearly
 a. 120
 b. 140 V *
 c. 175 V
 d. 240 V
245. The part that houses the conductors and in which e.m.f. has induced is said to be
 a. field
 b. armature
 c. rotor
 d. stator *
246. Dummy coils in a d.c. generator is provided
 a. to amplify voltage
 b. to reduce eddy current losses *
 c. to enhance flux density
 d. to provide mechanical balance to the rotor
247. A brake test can only be recommended for usually restricted to
 a. open frame type motors
 b. small horse power motors
 c. high speed motors
 d. variable speed motors *
248. What will happen if the back e.m.f. of a d.c. motor suddenly vanishes
 a. the motor will start hunting
 b. the motor will suddenly stop
 c. the motor speed will increase
 d. short circuit current will flow through armature *
249. A d.c. series motor should not be started at no - load, because
 a. it will refuse to start at no - load
 b. at no load it will develop high starting torque
 c. it draws a small amount of current at no - load
 d. at no - load it will rotate at a dangerously high speed *
250. The function of a starter in d.c. motor is to
 a. increase its speed
 b. reduce the losses
 c. reverse its direction of rotation
 d. reduce the starting current to a safe value *
251. "Flashing the field" of d.c. generator actually means
 a. checking field polarity
 b. neutralising residual magnetism *
 c. increasing flux density of poles
 d. creating residual magnetism by a d.c. source
252. Lap winding is composed of
 a. any odd number of conductors *
 b. any even number of conductors
 c. that even number which is exact multiple of poles
 d. that even number which is exact multiple of poles + 2
253. Which of the following can be determined in case of retardation test of shunt motor and generator ?
 a. stray losses
 b. friction losses
 c. eddy current losses
 d. copper losses *
254. In a d.c. motor the developed torque is 200 N-m at 600 r.p.m. At 500 r.p.m., the motor torque would be
 a. 133 N.m *
 b. 167 N.m
 c. 180 N.m
 d. 200 N.m
255. Which of the following does not contribute to neutralise the self induced emf in coil ?
 a. dummy coils *
 b. interpoles
 c. shifting of axis of brushes
 d. compensating win
256. The e.m.f. induced in the armature of a shunt generator is 400 V. If the armature resistance be 0.1 ohm, the armature current be 100 A, the terminal voltage will be
 a. 390 V
 b. 399 V *
 c. 400 V
 d. 420 V
257. In tapped field control method of speed control of d.c. series motor, the speed will be minimum, when
 a. only few turns are in the circuit
 b. all the field turns are in the circuit
 c. only fifty percent field turns are in the circuit
 d. none of the above *
258. The relation between the generated e.m.f. and the supply voltage for a d.c. shunt motor is
 a. $V = E$
 b. $V = E - I_a R_a$ *
 c. $V + E = I_a R_a$
 d. $V = E + I_a R_a$
259. In a d.c. series motor, increase in load current results in
 a. better commutation *
 b. decrease in speed
 c. increase of back e.m.f.
 d. increase in speed
260. In a d.c. motor for lathe is
 a. shunt motor
 b. series motor *
 c. any of a. and b.
 d. none of these

261. In a d.c. motor, back e.m.f. depends on
 a. brush material * b. field flux
 c. shape of conductors d. type of slip rings
262. Which of the following devices can be used for controlling the speed of a d.c. motor ?
 a. Thyristor b. Transistor
 c. Thermistor * d. Diode
263. For the same power rating the cost of a 1500 r.p.m. machine as compared to the cost of a 3000 r.p.m. machine is
 a. half b. less
 c. more d. same *
264. The decrease in back e.m.f. of a shunt motor, from no-load to load condition is due to
 a. increase in load current *
 b. armature reaction
 c. armature resistance drop
 d. all of these
265. Under which condition, the magnetic neutral axis coincides with the geometrical neutral axis of a d.c. generator ?
 a. at no load
 b. at full load *
 c. at rated speed
 d. during voltage build up period
266. The voltage drop for which of the following types of brush can be expected to be least ?
 a. carbon brushes *
 b. metal graphite brushes
 c. graphite brushes
 d. none of the above
267. Most suitable motor for electric traction is
 a. d.c. series motor
 b. d.c. compound motor *
 c. d.c. shunt motor
 d. none of these
268. In a d.c. motor the starting resistance is used
 a. across the motor
 b. in series with the armature
 c. in series with the motor as a whole
 d. in series with the field winding *
269. Proper commutation in d.c. machines requires
 a. concentric commutator and firm brush holder
 b. use to brushes with proper grade and size
 c. smooth contact of brushes on the commutator *
 d. all of the above
270. The function of the interpole flux is to
 a. neutralise the armature reaction flux
 b. neutralise the commutating self-induced e.m.f.
 c. neutralise both the armature reaction flux as well as commutating e.m.f. induced in the coil
 d. none of these *

271. The starter for a d.c. motor also provides protection to the motor against damage
 a. from long-term over loads *
 b. from excessive starting currents
 c. due to short circuits in the equipment
 d. all of the above
272. Usually small d.c. motors upto 5 HP are rated for
 a. 2 poles b. 4 poles *
 c. 6 poles d. 18 poles
273. The starting current of a d.c. motor is
 a. less than full load current of the motor
 b. much more than the full load current of the motor*
 c. equal to full load current of the motor
 d. equal to no load current of the motor
274. The speed of a d.c. series motor at heavy loads
 a. increases b. decreases
 c. remains same * d. becomes zero
275. In the fig. 6, the characteristics of a cumulatively compounded d.c. motor is represented by

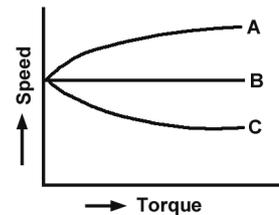


Fig. 6

- a. curve A b. curve B
 c. curve C * d. none of the above
276. The characteristics of a differentially compounded d.c. motor is represented by
 a. curve A b. curve B *
 c. curve C d. none of the above
277. Which numbered characteristics, as shown in figure 7 shows speed torque characteristic of d.c. shunt motor

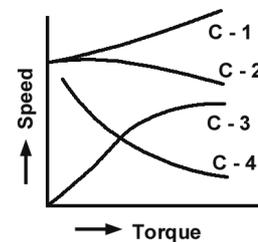


Fig. 7

- a. curve - 1 b. curve - 2
 c. curve - 3 d. curve - 4 *
278. The power developed by a d.c. shunt motor will be maximum if the back e.m.f. is equal to
 a. V b. V^2
 c. \sqrt{V} d. $V/2$ *

279. An external resistance of $r_1 \Omega$ is connected in the field circuit and $r_2 \Omega$ in the armature circuit of a dc motor. At starting armature current will be minimum when
- r_1 and r_2 both are minimum *
 - r_1 and r_2 both are maximum
 - r_1 is maximum and r_2 is minimum
 - r_1 is minimum and r_2 is maximum
280. The function of a field regulator for compound motors is to
- control the flux
 - increase the armature resistance
 - limit the armature current *
 - demagnetize the magnetic field partially
281. Permeance is the reciprocal of
- ampere - turns
 - resistance
 - reluctance *
 - flux density
282. The thickness of laminations of a d.c. machine is approximately
- 0.005 mm *
 - 0.05 mm
 - 0.5 m
 - 5 mm
283. Which of the following curves of Fig. 8 represent speed torque characteristics of a d.c. series motor ?

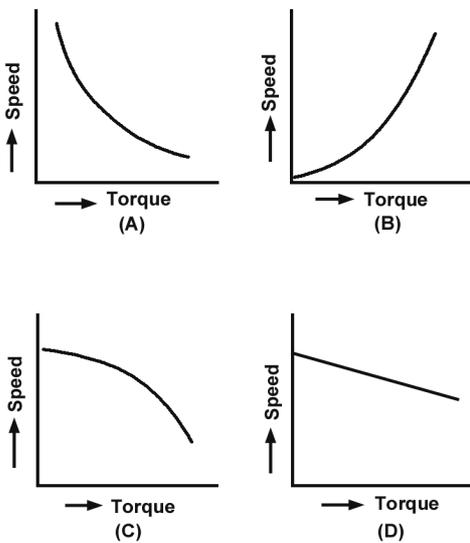


Fig. 8

- curve A
 - curve B *
 - curve C
 - curve D
284. In a d.c. series motor, why the shaft torque is less than the armature torque ?
- due to hysteresis losses *
 - due to stray losses
 - due to eddy current losses
 - due to all of the above
285. In an 8 - pole wave connected motor armature the number of parallel paths are
- 2
 - 4
 - 8 *
 - none of these

286. A shunt motor has
- variable speed and high starting torque
 - variable speed and low starting torque
 - constant speed and moderate starting torque *
 - constant speed and high starting torque
287. Developed torque and speed remain in the same direction in case of
- d.c. motors
 - d.c. generators
 - both d.c. generators as well as d.c. motors *
 - none of the above
288. Due to reversal of power flow direction, a cumulatively compounded motor become
- a shunt generator *
 - a series generator
 - a differentially compounded generator
 - a cumulatively compounded generator
289. In a d.c. machine the number of mechanical degrees and electrical degrees become same when
- number of poles is 2
 - number of poles is 4 *
 - lan winding is used
 - wave winding is used
290. Number of commutator segments in d.c. machine is equal to
- number of armature turns *
 - number of armature coils
 - number of armature conductors
 - number of armature coil sides
291. The starting resistor is connected in
- series with the armature
 - series with the field winding
 - parallel across the field winding
 - parallel across the armature *
292. The amount of flux leakage in a d.c. motor will depend on the
- length of air gap
 - shape of magnet core
 - flux density employed in core and teeth
 - all of the above *
293. If a d.c. motor is overloaded, the damage is due to
- bus bars getting overheated
 - starter getting damaged
 - bearings getting overheated *
 - winding getting overheated
294. If I be the moment of inertia and ω the angular speed, the kinetic energy of the armature will be given by

- $I \cdot \omega$ *
- $\frac{1}{2} I^2 \omega$
- $\frac{1}{2} I \omega^2$
- $\frac{1}{2} I^2 \omega^2$

- c. magnetic neutral axis moves from geometrical neutral axis in the opposite direction of rotation
 - d. none of the above *
311. Fleming's right - hand rule in d.c. generator, correlates
- a. magnetic field strength, induced voltage and current *
 - b. magnetic flux, direction of force and direction of motion of conductor
 - c. magnetic flux, direction of current flow and resultant force
 - d. magnetic flux, direction of motion and the direction of e.m.f. induced
312. When Fleming's right - hand rule is applied to d.c. generator for finding the direction of induced e.m.f., middle finger points in the direction of induced e.m.f. and fore finger points in the direction of
- a. lines of force *
 - b. motion of conductor
 - c. either of the above
 - d. none of the above
313. Which type of speed control is not possible in permanent magnet d.c. motor ?
- a. varying the field current
 - b. armature resistance control
 - c. armature voltage variation *
 - d. all of the above
314. The torque developed by a d.c. motor is dependent upon
- a. flux only
 - b. armature current only
 - c. armature current and flux
 - d. armature current and speed *
315. The function of pole shoes in d.c. machine is
- a. to support the field coil
 - b. to spread out the flux to achieve uniform flux density
 - c. to reduce the reluctance of the magnetic path
 - d. to discharge all the above functions *
316. In d.c. generators, the cause of rapid brush wear and tear in d.c. generator is due to
- a. imperfect contact
 - b. severe sparking
 - c. rough commutator surface
 - d. none of the above *
317. Due to the reversal of the direction of power flow, a differentially compounded motor becomes
- a. a shunt motor *
 - b. a series motor
 - c. a differentially compounded generator
 - d. a cumulatively compounded generator
318. Generated e.m.f. and the armature current are in the opposite direction in case of
- a. d.c. motors

- b. d.c. generators *
 - c. neither d.c. motors nor d.c. generators
 - d. both d.c. motors as well as d.c. generators
319. In Ward - Leonard System of speed control, minimum number of machines required, including the main motor, are
- a. two *
 - b. three
 - c. four
 - d. five
320. Ward - Leonard method of speed control of d.c. motor is basically
- a. a voltage control method
 - b. a field control method *
 - c. an armature control method
 - d. an armature diverter method
321. In a compound d.c. motor, the shunt field winding as compared to series field winding will have
- a. less turns and a smaller cross - section of wire
 - b. more turns and a smaller cross - section of wire
 - c. less turns and a larger cross - section of wire
 - d. more turns and a larger cross - section of wire *
322. Which of the following tests can be performed for estimating no load losses in a large d.c. shunt motor ?
- a. Leonard test *
 - b. Block rotor test
 - c. Hopkinson test
 - d. Swinburn test
323. The adjoining figure (Fig. 10) is the Schematic of a

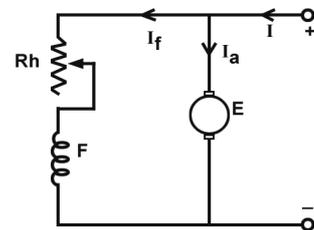


Fig. 10

- a. shunt motor
 - b. series motor
 - c. compound motor
 - d. shunt generator *
324. The adjoining figure (Fig. 11) is the schematic of a

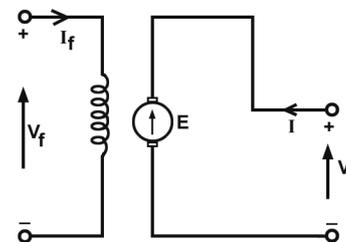


Fig. 11

- a. shunt motor
- b. series motor
- c. separately excited generator *
- d. separately excited motor

325. The adjoining figure (Fig. 12) is the schematic of

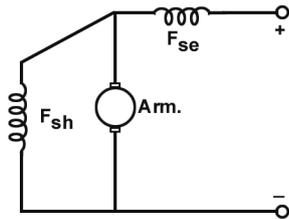


Fig. 12

- a. shunt machine
- b. series machine
- c. short shunt compounded machine
- d. long shunt compounded machine *

326. In a four - pole d.c. generator

- a. two north poles follow two south poles
- b. all the four poles are south poles
- c. all the four poles are north poles
- d. alternate poles are north and south *

327. In d.c. generator the field coils are usually made of

- a. carbon
- b. mica
- c. cast iron *
- d. copper

328. In the field circuit during the normal operation of a series motor suddenly opens, the motor

- a. will stop instantly
- b. will continue to run at rated speed *
- c. speed will tend to increase
- d. speed will drop suddenly

329. If the series field of a long shunt compound motor remains open, the motor

- a. will not start
- b. will start with jerk
- c. will run with vibrations and noise
- d. will first start and the stall *

330. The number of brushes in lap winding is always

- a. two
- b. half the number of poles
- c. double the number of poles *
- d. same as the number of poles

331. The armature of a d.c. machine is laminated to

- a. insulate the core *
- b. reduce the bulk weight
- c. reduce eddy current loss
- d. provide passage for cooling air

332. A differentially compounded d.c. motor runs at a full load speed of 480 r.p.m. If the series field of a differentially wound compound d.c. motor is short circuited, then the speed will be

- a. less than full load speed
- b. more than full load speed *
- c. same to full load speed
- d. zero

333. If the series field of a cumulatively compounded d.c. motor is short circuited, then the speed will be

- a. less than full load speed
- b. more than full load speed *
- c. full load speed
- d. zero

334. Which of the following curve in fig. 13 indicates, speed - armature current characteristic of shunt motor ?

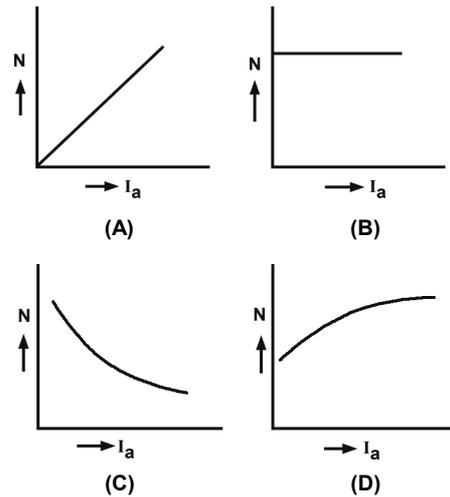


Fig. 13

- a. Curve. A *
- b. Curve. B
- c. Curve. C
- d. Curve. D.

335. The speed torque characteristics of three identical d.c. shunt motors M_1 , M_2 and M_3 are shown (Fig. 14). Which one would have highest field resistance ?

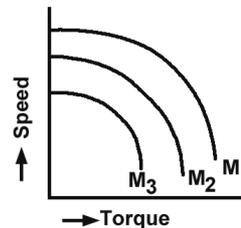


Fig. 14

- a. Motor M_1
- b. Motor M_2
- c. Motor M_3 *
- d. either M_1 or M_3

336. The main function of the starter for a d.c. motor is

- a. to increase field resistance *
- b. to reduce armature resistance
- c. to limit the starting current
- d. to limit the starting voltage

337. Which types of winding requires Equilizer rings ?

- a. lap wound *
- b. delta wound
- c. wave wound
- d. duplex wound

338. B being the flux density, l the length of conductor and v the velocity of conductor, then induced e.m.f. is given by

- a. Bv
- b. Bl^2v *
- c. Blv^2
- d. Bl^2v^2

339. The direction of rotation, of a d.c. shunt motor can be effectively reversed by interchanging
- line loads
 - armature connections
 - shunt field connections
 - series field connections *
340. Under normal rated condition, the full load current of a d.c. shunt motor is 50 A. If the field flux and the armature terminal voltage are reduced to half, then what should be the armature current for constant power output ?
- 25 A
 - 50 A
 - 75 A *
 - 100 A
341. Welding generators do have
- delta winding
 - wave winding
 - lap winding
 - duplex winding *
342. Due to which of the following purpose dummy coils in a generator is provided ?
- to amplify voltage
 - to reduce eddy current
 - to enhance flux density
 - to provide mechanical balance for the rotor *
343. Speed control of a shunt motor by the variation of field flux will provide
- variable power drive
 - variable torque drive
 - constant torque drive *
 - constant power drive
344. For which type of d.c. motor, increase of torque needs proportional increase of motor input current ?
- universal motor *
 - series motor
 - shunt motor
 - cumulating compound motor
345. For higher capacity d.c. generators which winding is generally preferred ?
- lap winding
 - current depends on design *
 - progressive wave winding
 - retrogressive wave winding
346. Which of the following is the insulating material used between the commutator segments ?
- paper
 - mica
 - insulating varnish *
 - graphite
347. A d.c. motor, having armature resistance of 0.1Ω , is suddenly switched on against a 220 V d.c. supply. The current drawn by the motor will be
- 220 A
 - 1100 A *
 - 2200 A
 - none of the above
348. A d.c. series motor develops a torque of 10 Nm at 1 A of load current. If the current is increased to 2A, the torque developed will be
- 80 N.m *
 - 40 N.m
 - 20 N.m
 - 10 N.m
349. A d.c. shunt motor runs at N_1 r.p.m. If this motor is to run at N_2 r.p.m. for sometime, and if $N_2 > N_1$, which speed control will be desirable
- field resistance control *
 - input voltage control
 - armature current control
 - ward leonard control
350. The most practical way to achieve speed control of a d.c. shunt motor would be to insert a resistance suitable value is
- series with the field
 - series with the armature
 - parallel with the field *
 - parallel with the armature
351. If P be the number of poles and N be the r.p.m. of rotor of a d.c. generator, then the frequency of magnetic reversals will be
- $\frac{N.p}{2}$ *
 - $\frac{N.p}{60}$
 - $\frac{N.p}{120}$
 - $\frac{N.p}{3000}$
352. Which of the following statement about d.c. generators is false ?
- equilizing bus bars are used with parallel running of d.c. shunt generators
 - compensating winding in a d.c. machine helps in commutation
 - in a d.c. generator interpole winding is connected in series with the armature winding
 - back pitch and front pitch are both odd and approximately equal to the pole pitch *
353. When a d.c. series motor is subjected to rheostatic braking
- motor speed fluctuates
 - motor runs at reduced speed *
 - motor speed is reversed
 - motor is run as a generator
354. A d.c. motor can be easily identified by
- winding
 - yoke
 - commutator *
 - size of conductor
355. For a series motor which relation is valid for operation in linear zone ? [T_a = armature torque, I_a = armature current]
- $T_a \propto I_a$
 - $T_a \propto \frac{1}{(I_a)^2}$ *
 - $T_a \propto \frac{1}{(I_a)^2}$
 - $T_a \propto I_a^2$

356. Which of the following materials is used as insulation between the segments of a commutator ?
 a. paper b. mica
 c. fabric * d. either b. or c.
357. A d.c. shunt motor is driving a mechanical load at rated voltage and rated excitation. If the load torque becomes double then the speed of the motor
 a. becomes half b. increases slightly
 c. decreases slightly * d. becomes double
358. An amplidyne has split poles to
 a. increase efficiency
 b. damp out mechanical oscillations *
 c. provide space for interpoles
 d. increase amplification factor
359. The full load current of a 10 H.P., 230 V d.c. motor will be around
 a. 16 A * b. 33 A
 c. 66 A d. 100 A
360. Consider the following statements in respect of compensating windings in d.c. motors
 i. Compensating windings are connected in series with the armature
 ii. Compensating windings produce mmf in the same direction as armature mmf.
 iii. Compensating windings aid commutation
- Mark the correct answer below
 a. Statements (i) and (ii) are true but (iii) is false
 b. Statements (i), (ii) and (iii) are all true
 c. Statements (i) is true but (ii) and (iii) are false
 d. Statements (i) and (ii) are true but (iii) is false *
361. A d.c. series motor should not be run at light / no - load, because
 a. it will stall
 b. it will draw a dangerously large current
 c. it will draw a dangerously high current and run at a dangerously high speed *
 d. it will run at a dangerously high speed
362. In a d.c. machine the armature reaction and the inductance of the commutating coils result in
 a. linear commutation
 b. over - commutation *
 c. under commutation
363. Inter poles in a d.c. motor should be
 a. series excited and should have the same polarity as that of the main pole in the direction of rotation of the armature
 b. series excited and should have polarity opposite to that of the next main pole in the direction of rotation of armature
 c. shunt excited and should have the same polarity as the next main pole in the direction of rotation of the armature *
- d. shunt excited and should have polarity opposite to that of the next main pole in the direction of rotation of the armature
364. Why are poles in a d.c. machine extended and curved?
 a. to increase induced emf
 b. to improve commutation characteristics *
 c. to reduce armature reaction effect
 d. to achieve nearly sinusoidal air - gap of flux density distribution
365. Let θ be the angle between the sinusoidally distributed stator and rotor m.m.f.'s then
 a. in d.c. synchronous and induction machines θ is fixed at 90° *
 b. in d.c. machines θ is fixed at 90° while θ in synchronous and induction machines can have different values
 c. in d.c. synchronous and induction machines θ can be different from 90° .
 d. in synchronous and induction machines θ is fixed at 90° , while θ in d.c. machines can have different value
366. A homopolar generator usually has
 a. low voltage and high current
 b. high voltage and low current *
 c. high voltage and high current
 d. low voltage and low current
367. The teeth in the armature of a d.c. machine are sometimes skewed
 a. to reduce eddy current loss
 b. to reduce vibrations
 c. to reduce both hysteresis and eddy current loss *
 d. to reduce hysteresis loss
368. The armature iron in a d.c. machine is laminated
 a. to reduce cost
 b. to reduce hysteresis loss *
 c. to reduce eddy current loss
 d. to reduce both hysteresis and eddy current loss
369. The number of re-entrancy of a duplex lap winding is 2 only if
 a. the number of slots is odd
 b. the number of coils is even
 c. the commutator pitch is 2 *
 d. the commutator pitch is odd
370. Why is the pole shoe in a d.c. machine larger than its pole body ?
 a. it helps to make the flux density wave nearly sinusoidal
 b. it gives sinusoidal flux density
 c. it reduces iron loss in the pole shoes and gives a more nearly rectangular flux density wave
 d. it provides a support for field winding *
371. Why is it necessary to provide compensating winding in d.c. motor ?

385. A 6 pole d.c. armature has simplex cap - connected 720 conductors, 3 turns per coil and 4 coil sides per slot. Determine the number of slots in the armature and state whether equalizers can be employed
- 120 slots, not possible
 - 60 slots, not possible
 - 30 slots, possible *
 - 60 slots, possible
386. The commutator pitches of simplex and duplex lap windings are respectively
- 1 and 1
 - 2 and 2
 - 1 and 2 *
 - 2 and 4
387. A differentially compounded motor under high over - load conditions will behave like a/an
- a.c. synchronous motor *
 - shunt motor
 - series motor
 - cumulative compound motor
388. What losses occur in the teeth of a d.c. machine armature ?
- both hysteresis and eddy current loss
 - eddy current loss only
 - hysteresis loss only *
 - no losses
389. Inter - poles help commutation in a d.c. machine by :
- aiding the main poles
 - cancelling the armature reaction m.m.f. *
 - by causing dynamically induced e.m.f. in the coils undergoing commutation
 - by causing statically induced e.m.f. in the coils undergoing commutation
390. In a d.c. machine, operating in the saturated region, the armature reaction effect is
- demagnetizing only
 - cross - magnetizing as well as demagnetizing
 - magnetizing only *
 - cross - magnetizing only
391. In a duplex wave winding with equalizers
- number of pole - pairs is even and number of slots is odd
 - both number of pole - pairs and numbers of slots are odd
 - both number of pole - pairs and number of slots are even *
 - number of pole - pairs is odd and number of slots is even
392. A conductor of length l metre is perpendicular to a magnetic flux system of density B Wb/m² and carries a current of I amp. It experiences a force of
- BIl dynes in the direction perpendicular to both B and l *
 - BIl Nw. in the direction of B
 - BIl Nw, in the direction perpendicular to both B and l
 - BIl Nw. in the direction of l
393. The brushes of a d.c. machine should be placed
- on the commutator in the polar axis
 - on the commutator in the interpolar axis *
 - on the armature in the interpolar axis (midway between poles)
 - on the armature in the polar axis
394. D.C. machines poles are constructed of thick laminations
- to reduce iron loss in pole body and for ease of construction *
 - to reduce pulsation loss in pole shoes and for ease of construction
 - for ease of construction
 - to reduce iron loss in pole body and pole shoes
395. The armature reaction AT in a d.c. machine :
- make an angle of 90° with the main pole axis
 - are in the same direction as the main poles
 - are in direct opposition to the main poles *
 - makes an angle with the main pole axis which is load dependent
396. M.K.S. units of magnetic flux, flux density and intensity are respectively
- Maxwell, Gauss Amp - turns
 - Weber, Weber /metre², Amp - turns
 - Weber, Weber /metre², Amp / metre *
 - Lines, Lines /metre², Oersted
397. A short - circuited rectangular coil falls under gravity with the coil remaining in a vertical plane and cutting perpendicularly horizontal magnetic lines of force. Its acceleration
- increase
 - remains constant
 - decrease *
 - is zero
398. The induced e.m.f. in a conductor of length l moving with velocity in magnetic flux of density B , (while B , l and v are mutually perpendicular) is Blv volts provided
- B is in gauss / meter², l is in metre and v is in metre /sec *
 - B is in Weber, l is in metre and v is in metre /second
 - B is in Weber /metre², l is in metre and v is in metre per second
 - B is in gauss, l is in centimetric and v is in centimetre /second
399. Which one of the following statements is correct ?
- the direction of current in a generator is same as that of its induced e.m.f. while that in a motor is opposite to its induced e.m.f.
 - the direction of current in a generator is opposite to its induce e.m.f. while that in a motor is same as that of its induced e.m.f.
 - the direction of currents in both generators and motors is same as that of their induced e.m.f. *
 - the direction of currents in both generators and motors is opposite to their induced e.m.fs.

400. A d.c. shunt motor is driving a constant torque load without any additional resistance in the armature circuit. If a additional resistance is placed in the armature circuit then the speed of the motor
- remains unchanged
 - becomes zero *
 - decreases
 - increases
401. Three point starters of d.c. shunt motors are not used in application where speed variation by field flux control is required because
- the motor may run away
 - the motor may stop both at very high and at very low speeds
 - the motor may stop at very low speeds *
 - the motor may stop at very high speeds
402. In Swinburne's method for the determination of efficiency of a d.c. machine
- both the no - load losses and the copper losses are measured
 - the no - load losses are calculated and the copper losses are measured
 - the no - load losses are measured and the copper losses are calculated
 - both the no - load losses and the copper losses are calculated *
403. A dc shunt generator has a speed of 800 rpm when delivering 20 A at 220 V. If this machine is operated as a motor taking line current of 20 A from 220 V supply, the speed could be
- 800 rpm
 - more then 800 rpm *
 - unpredictable
 - has then 800 rpm
404. In a d.c. motor the torque (Nm) developed is
- $\omega_m / E_a I_a$ in the direction of ω_m
 - $E_a I_a / \omega_m$ in the direction of ω_m
 - $\omega_m / E_a I_a$ opposite to the direction of ω_m (speed in mech rad /s)
 - $E_a I_a / \omega_m$ opposite to the direction of ω_m *
405. In a drum type d.c. armature winding the back pitch and front pitch in terms of coil sides must be
- even and odd respectively
 - odd and even respectively *
 - both even
 - both odd.
406. Mark the correct statement below with respect of a d.c. shunt motor :
- No - load speed is directly proportional to flux / pole and inversely proportional to armature voltage, the speed rises linearly with load torque
 - No - load speed is inversely proportional to flux / pole and diretly proportional to armature voltage, the speed drops off linearly with load torque *
 - No - load speed is inversely proportional to flux / pole and directly proportional to armature voltages the speed rises linearly with load torque
 - No - load speed is directly proportional to flux / pole and inversely proportional to armature voltage, the speed drops off linearly with load torque.
407. A d.c. shunt motor is running at rated speed with rated supply voltage. If the supply voltage is halved, then the speed the motor becomes
- half of the rated speed *
 - slightly less than the rated speed
 - slightly more than the rated speed
 - double the rated speed
408. If the field circuit of a d.c. shunt motor running at rated speed gets open - circuited, then immediately after this the speed of the motor would tend to
- increase
 - decrease *
 - oscillate around the rated speed
 - remain unchanged
409. Direct - on - line starters are not suitable for starting large motors because
- variable torque drive *
 - large voltage drop may occur in the supply mains
 - the motor may not start
 - the motor may run away
410. A d.c. shunt motor is driving a constant torque load with rated excitation. If the field current is halved then the speed of the motor
- becomes slightly less than double
 - becomes double
 - becomes slightly more than half *
 - becomes half
411. A d.c. shunt motor has two additional resistance R_1 and R_2 the field circuit and armature circuit respectively. Starting armature current can be kept to a minimum keeping
- R_1 minimum and R_2 minimum
 - R_1 maximum and R_2 maximum
 - R_1 minimum and R_2 maximum *
 - R_1 maximum and R_2 minimum
412. For a d.c. generator if the brushes are given a small amount of forward shift the effect of armature reaction is
- totally cross - magnetizing
 - totally demagnetizing *
 - portly demagnetizing and partly cross - magnetizing
 - totally magnetizing
413. The brushes of a d.c. machine are
- physically placed in the polar axes and electrically connected to the coils in the polar axes
 - physically placed in the polar axes and electrically connected to the coils in the interpolar axes
 - physically placed in the interpolar axes and electrically connected to the coils in the interpolar axes *

- d. physically placed in the interpolar axes and electrically connected to the coils in the polar axes
414. Slot wedges in a d.c. machine are made of
 a. silicon steel b. fibre
 c. mild steel * d. cast iron
415. A 6 - pole lap wound be armature with 720 conductors draws 50 A from the mains. The the armature reaction mmf per pole is
 a. 500 AT peak, sinusoidal in wave shape
 b. 1000 AT peak, sinusoidal in wave shape *
 c. 500 AT peak, triangular in wave shape
 d. 1000 AT peak, triangular in wave shape
416. The armature reaction m.m.f. wave in a d.c. machine
 a. moves relative to the brushes at armature speed *
 b. is stationary relative to the brushes
 c. moves relative to the brushes at synchronous speed
417. Field control of a d.c. shunt motor gives :
 a. constant kW drive
 b. constant torque drive
 c. constant speed drive *
 d. variable load speed drive
418. The commutator of a d.c. machine acts as a
 a. controlled full - wave rectifier
 b. half - wave rectifier
 c. full wave rectifier *
 d. controlled half - wave rectifier
419. In d.c. machines, the polarity of the interpole is
 a. same as that of the main pole behind for both the generators and the motors
 b. same as that of the main pole behind for the generators and that of the main, pole ahead for the motors
 c. same as that of the main pole ahead for the generators and that of the main pole behind for the motor
 d. same as that of the main pole ahead for both the generators and the motors *
420. Due to magnetic saturation, the flux per pole in a d.c. machine without brush shift
 a. increases in both the generators and the motors with load
 b. decreases in the generators and increases in the motors with load
 c. increases in the generators and decreases in the motors with load *
 d. decreases in both the generators and the motors with load
421. Compared to the air - gap under the field - poles, the interpole air - gap is made
 a. smaller for generators and larger for the motors
 b. smaller for both the generators and the motors
 c. larger for both and generators and the motors *
- d. larger for the generators and smaller for the motors
422. In a d.c. generator, e.m.f. due to residual flux is fed back to the shunt winding positively. Why does the no - load voltage build up to a finite steady value ?
 a. because of eddy - current loss in pole shoes *
 b. because of field winding resistance
 c. because of magnetic saturation
 d. because of field winding inductance
423. The armature reaction m.m.f. in a d.c. machine is
 a. triangular in shape b. sinusoidal in shape
 c. trapezoidal in shape d. rectangular in shape *
424. For non - reversing d.c. drives it is preferable to employ
 a. plugging
 b. dynamic braking with self excitation *
 c. regenerative braking
 d. dynamic braking with separate excitation
425. In Ward - Leonard method of speed control the direction of rotation of the motor is reversed usually by
 a. reversing the connections of the generator armature terminals
 b. reversing the connections of the generator field terminals
 c. reversing the connections of the motor armature terminals *
 d. reversing the connections of the motor field terminals
426. What counters commutation in a d.c. machine ?
 a. brush resistance
 b. interpoles
 c. coil leakage inductance
 d. armature reaction *
427. Two d.c. series motors connected in series are driving the same mechanical load. If the motors are now connected in parallel the speed becomes
 a. slightly more than half
 b. slightly less than double
 c. slightly less than half
 d. slightly more than double *
428. A d.c. shunt motor is running at rated speed with rated excitation, rated voltage and with an additional resistance in the armature circuit. Speeds less than the rated speed can be achieved by
 a. decreasing the armature circuit resistance and decreasing the field
 b. decreasing the field excitation and increasing the supply voltage
 c. increasing the supply voltage and decreasing the armature circuit resistance *
 d. reducing the supply voltage and increasing the field excitation
429. In a d.c. machine without interpoles to get improved commutation, the brush shift angle must be

- a. kept constant
 - b. 0°
 - c. varied with change in load *
 - d. none of the above
430. Consider the following statements
Compensating windings are used in a d.c. motor which are intended to operate
- i. with rapidly changing loads of wide range
 - ii. at constant speed over wide range of load
 - iii. over wide range of speed by field excitation control
- State which of the following is correct :
- a. only (iii)
 - b. only (i) and (iii) *
 - c. only (i)
 - d. only (ii) and (iii)
431. A d.c. series motor has linear magnetization and negligible armature resistance. The motor speed is
- a. inversely proportional to T
 - b. inversely proportional to \sqrt{T} *
 - c. directly proportional to T
 - d. directly proportional to \sqrt{T}
432. In the Hopkinson's test on two identical shunt motors the power input to the armature circuit comprises
- a. armature copper loss + windage and friction loss
 - b. copper loss + no - load iron loss + windage and friction loss
 - c. armature copper loss + no load iron loss + windage and friction loss *
 - d. armature copper loss + no - load iron loss + stray - load iron loss
433. A d.c. machine has maximum efficiency when
- a. constant losses equal variable losses
 - b. windage and friction losses equal copper loss
 - c. constant losses equal losses proportional to the square of the current *
 - d. iron losses equal copper losses
434. In a series - parallel field control of a d.c. series motor with fixed armature current
- a. series connection gives higher speed *
 - b. both series and parallel connection give the same speed
 - c. parallel connection gives higher speed
 - d. such connections are not used in practice
435. The process of current commutation in a d.c. machine is delayed by the
- a. reactance e.m.f.
 - b. coil resistance
 - c. brush resistance *
 - d. e.m.f. induced in the commutating coil because of the interpole flux
436. In an unsaturated d.c. machine armature reaction effect is
- a. magnetizing
 - b. demagnetizing
 - c. cross - magnetizing *
 - d. kind of effect depends upon whether the machine is motoring or generating.
437. For a given torque, reduction of the diverter resistance of a d.c. series motor causes
- a. decrease its speed, demanding less armature current
 - b. decrease its speed but armature current remains the same
 - c. increase its speed, demanding more armature current *
 - d. increase its speed but armature current remains the same
438. The voltage on full - load of a d.c. generator is found to be equal to its voltage on no - load. The generator is
- a. shunt
 - b. differential compound
 - c. cumulative compound *
 - d. separately excited
439. A d.c. cumulative compound generator with interpoles was operating satisfactorily supplying steady d.c. load when the machine was stopped. The machine was rotated with same connections and the same direction of rotation but with the polarity of residual magnetism reversed. Consider the following statements
- i. the machine does not build up
 - ii. the machine builds up with reversed polarity
 - iii. the machine now runs as differential compound generator
 - iv. the interpoles have proper polarity for good commutation. Select the correct answer from the following code.
- a. only (ii) and (iii) are true *
 - b. only (ii) and (iv) are true
 - c. only (i) is true
 - d. only (ii), (iii) and (iv) are true
440. Mark the correct statement in Table I in respect of speed torque characteristics of d.c. motors ?

Table - I

Shunt Motor	Series Motor	Compound Motor (Cumulative)
a. Slightly drooping curve	rectangular hyperbola	heavily drooping curve
b. rectangular hyperbola	slightly drooping curve	heavily drooping curve
c. heavily drooping curve	rectangular hyperbola	slightly drooping curve
d. heavily drooping curve	slightly drooping curve	rectangular hyperbola *

441. In a shunt motor for given field and armature currents
- with unsaturated magnetic circuit the motor can acquire a dangerously high speed
 - the state of saturation of the magnetic circuit will have no effect on the speed of the motor
 - speed will be higher if the magnetic circuit is unsaturated than if the magnetic circuit is saturated.
 - speed will be higher if the magnetic circuit is saturated than if the magnetic circuit is unsaturated*
442. Equalizer bus is necessary for the parallel operation of the following type of d.c. generators
- over compound generators only *
 - series generators only
 - series and over compound generators
 - series and any type of compound generators
443. In a level compound generator the series field ampere turns are
- in the same direction as the shunt field ampere - turns
 - at 90° (elect) to the shunt field ampere turns
 - placed on the interpoles *
 - in direct opposition to the shunt field ampere - turns
444. The most suitable generator for welding purpose is
- cumulative compound*
 - shunt
 - differential compound
 - separately excited
445. The following type of d.c. generators is the most suitable booster
- series
 - shunt
 - separately excited
 - compound *
446. In a level compound generator for terminal voltage at half load is
- is less than the no-load voltage
 - the same as the no - load voltage
 - the same as the full - load voltage *
 - is more than the no - load voltage
447. A d.c. generator is run with different modes of field excitation keeping no - load voltage constant. The short circuit current is minimum when it is
- shunt *
 - separately excited
 - differential compound
 - cumulative compound
448. Two coupled d.c. series motors with constant torque load are changed over from series to parallel connection across a fixed voltage supply. How does the set speed change compared to the original speed ?
- speed becomes double *
 - speed becomes $\sqrt{2}$ times
 - speed becomes half
 - speed becomes not change
449. For build - up of voltage residual magnetism is essential in field system of all types of d.c. generators except
- separately excited
 - series and separately excited
 - compound and separately excited
 - shunt *
450. A d.c. generator running at fixed speed and with fixed shunt field resistance has
- short - circuit current equal to the maximum load current that it can feed
 - short - circuit current equal to the full load current
 - short - circuit current more than the maximum load current that it can feed *
 - short - circuit current less than the maximum load current that it can feed
451. On switching a d.c. motor is found to rotate in the direction opposite to that for which it is designed. The motor is
- shunt
 - cumulative compound
 - differential compound *
 - series
452. A Cumulative compound motor runs at 1000 r.p.m. on no - load; on full - load the flux increases 20% whereas the full - load drop in the combined resistance of the armature and series field is 4%. What is the full - load speed ?
- 1240 r.p.m.
 - 640 r.p.m.
 - 800 r.p.m.*
 - 960 r.p.m.
453. A series motor must not be run at low loads because
- the speed will be very low
 - there will be complete demagnetisation of the field system
 - the speed will be very high *
 - the current will be very high
454. Carbon brushes are used in d.c. machines because
- they aid in reversing the commutating coil current only
 - they serve the purpose of interpoles
 - they aid in reversing the commutating coil current and keep down the wear of the commutator *
 - they keep down the wear of the commutator only
455. At full - load the demagnetising effect of armature reaction reduces the flux by 10 %, whereas the full - load armature circuit drop is 5.5 %. What is the full - load speed expressed as percentage of no - load speed of the motor ?
- 110%
 - 105%
 - 90% *
 - 9.45 %
456. A d.c. series motor has the following data for its magnetising characteristic in terms of percentage of

- | | | | | |
|--------------------|-------|----|-----|---------------------------|
| full - load values | | | | c. constant power drive * |
| Current % | 60 | 80 | 100 | d. variable power drive |
| Clux % | 83.33 | 93 | 100 | |
- The series field has the resistance of 1 ohm. The full - load speed to 1200 r.p.m. full load torque remaining unaltered ?
- a. 2 ohm b. 15 ohm
c. 1 ohm * d. .05 ohm
457. A d.c. over compound generator was operating satisfactorily and supplying power to an infinite bus when the prime mover failed to supply any mechanical power. The machine then runs as a
- a. differential compound motor with speed reversed
b. cumulative compound motor with speed reversed*
c. differential compound motor with direction of speed as before
d. cumulative compound motor with direction of speed as before
458. A motor is run successively as a shunt motor, differential compound motor and cumulative compound motor with the same no - load speed. They can be arranged in the following order of decreasing full - load speeds.
- a. cumulative compound, shunt, differential compound *
b. differential compound, shunt, cumulative compound
c. shunt, differential compound, cumulative compound
d. cumulative compound, differential compound, shunt
459. Compensating windings in d.c. motors are
- a. series excited for cancellation of armature reaction ampere - turns at any load
b. series excited so that armature reaction is aided at any load *
c. shunt excited to cancel armature reaction at any load
d. shunt excited to aid the main poles at any load
460. Which one of the following types of d.c. motors is the most suitable for traction purposes ?
- a. series motor
b. shunt motor
c. differential compound
d. cumulative compound *
461. A shunt motor may have rising mechanical characteristic due to
- a. very high field circuit resistance
b. very high armature circuit resistance
c. very low demagnetising armature reaction *
d. very high demagnetising armature reaction
462. For d.c. shunt motor, speed control by armature resistor variation is best suited for
- a. constant torque drive
b. variable torque drive
463. A d.c. series motor is running with a diverter connected across its field winding. If the diverter resistance is increased then the speed of the motor
- a. remains unchanged
b. becomes excessively high
c. decreases *
d. increases
464. Plugging of d.c. motors is normally executed by
- a. connecting a resistance across the armature *
b. reversing both armature and field polarity
c. reversing the armature polarity
d. reversing the field polarity
465. D.C. motor starters are used
- a. to limit the starting current
b. to increase the starting torque
c. both a. and b.*
d. none of the above
466. A d.c. series motor is running at rated speed without any additional resistance in series. If an additional resistance is placed in series the speed of the motor
- a. remains unchanged
b. oscillates around the rated speed
c. decreases
d. increases *
467. For d.c. shunt motors the field excitation is kept at maximum value during starting to
- a. prevent voltage dip in the supply mains *
b. increase acceleration time
c. decreasing starting torque
d. reduce armature heating
468. In a d.c. motor if the brushes are given a backward shift, then
- a. commutation is improved and speed increases
b. commutation is unaffected and speed increases *
c. commutation is improved and speed decreases
d. commutation is worsened and speed decreases
469. A d.c. shunt motor while running on no - load draws power mainly for
- a. no - load iron loss + stray load iron loss + windage and friction loss
b. no - load iron loss + windage and friction loss
c. no - load iron loss only *
d. windage and friction loss only
470. Mark the correct statement below in respect of the field control of a d.c. shunt motor
- a. weakening the field reduces motor speed but increases its full - load torque capability
b. weakening the field increases motor speed but reduces its full - load torque capability
c. weakening the field increases motor speed but reduces its full - load torque capability

- d. weakening the field increases motor speed but does not affect its full - load torque capability *
471. In series - parallel control of a d.c. series motor the total field turns are N then :
- $AT_{\text{parallel}} = AT_{\text{series}}$
 - $AT_{\text{parallel}} = \frac{1}{4} AT_{\text{series}}$
 - $AT_{\text{parallel}} = 2 AT_{\text{series}}$ *
 - $AT_{\text{parallel}} = \frac{1}{2} AT_{\text{series}}$
472. Ohmic losses in a d-c machine occur in
- the brush contact only
 - the armature winding only
 - the armature winding the field winding and also in the brush contact *
 - the field winding only
473. If the thickness of laminations is increased, then
- the hysteresis loss increases
 - the hysteresis loss decreases
 - the eddy current loss increases *
 - the eddy current loss decreases
474. Consider the following statements on cross -field generators
- to increase amplification factor compensating winding should be provided
 - the reversal of speed does not reverse the output voltage
 - the number of brush studs is double of that of poles
- Select correct answer from the list gives below
- only (i) and (iii) are true
 - only (i) and (ii) are true
 - all the statements are true *
 - only (ii) and (iii) are true
475. If the number of poles in the first stage of a Rototrol is 2, the number of poles in the second stage is
- 6 *
 - 8
 - 4
 - 2
476. Under - commutation gives rise to
- sparkling at the trailing edge of the brush
 - sparkling at the middle of the brush
 - no sparking at all
 - sparkling at the leading edge of the brush *
477. In a d.c. machine without any brush shift, the shift of the magnetic neutral axes due to armature reaction is
- against the direction of rotation for both the generator and the motor *
 - against the direction of rotation for the generator and in the direction of rotation for the motor
 - in the direction of rotation for both the generator and the motor
 - in the direction of rotation for the generator and
- against the direction of rotation for the motor.
478. The e.m.f. induced in the armature of a d.c. machine is
- directly proportional to both the flux and the speeds*
 - inversely proportional to both the flux and the speed
 - directly proportional to the flux and inversely proportional to the speed
 - none of the above
479. The direction of induced e.m.f. in an armature coil of a d.c. machine is
- opposite to that of the current for both the generator and the motor
 - the same as that of the current for both the generator and the motor
 - the same as that of the current for the generator and opposite to that current for the motor
 - none of the above *
480. The parts of the armature electric circuit which take active part in e.m.f. generation are
- the commutator segments *
 - the overhangs
 - the coil - sides inside the slots
 - both the coil - sides inside the slots and the overhangs
481. In a d.c. machine the armature m.m.f. is always directed along the
- brush axis *
 - interpolar axis
 - polar axis
 - none of the above
482. Compared to an uncompensated d.c. machine, the interpolar AT required in a compensated d.c. machine is
- large for both the generators and the motors
 - large for the generators and smaller for the motors*
 - smaller for the generators and smaller for the motors
 - smaller for the generators and larger for the motors
 - smaller for both the generators and the motors
483. Consider the following statements for a commercial d.c. motor
- armature is stationary with respect to the field poles
 - armature is rotating with respect to the field poles
 - field is rotating with respect to the armature
- State which of the following is correct
- only (iii)
 - only (i) and (iii)
 - only (iii) *
 - only (i) and (iii)
484. Consider the following statements :
- armature reaction m.m.f. is produced under the pole - faces
 - armature reaction m.m.f. is in the interpolar zone
 - flash over between positive and negative brushes may take place due to armature reaction.
- State which of the following is correct.
- only (i) and (ii)
 - only (ii) and (iii)

- c. only (i) and (iii) * d. only (iii)
485. The waveform of the armature m.m.f. in a d.c. machine is
 a. rectangular b. sinusoidal *
 c. square d. triangular.
486. If the armature current of a d.c. motor is increased keeping the field flux constant, then the developed torque
 a. remains constant
 b. increases proportionally
 c. decreases in inverse proportion *
 d. increases proportional to the square of the current
487. The following condition is to be satisfied to avoid split coils in drum type d.c. armature windings
 a. $\frac{Y_b + 1}{a} = \text{an integer}$
 b. $\frac{Y_b - 1}{a} = \text{an odd integer}$
 c. $\frac{Y_b - 1}{a} = \text{an integer} *$
 d. $\frac{Y_b - 1}{a} = \text{an even integer}$
488. Due to magnetic saturation, the flux per pole in a d.c. machine without brush shift
 a. decreases in the generators and increases in the motors with load *
 b. increases in the generators and decreases in the motors with load
 c. decreases in both the generators and motors with load
 d. increases in both the generators and the motors with load
489. A d.c. machine is provided with both interpole winding (IPW) and compensating winding (CPW) with respect to the armature
 a. both IPW and CPW are in series *
 b. both IPW and CPW are in parallel
 c. IPW is in parallel and CPW is in series with armature
 d. IPW is in series and CPW is in parallel with armature.
490. Consider the following statements :
 The purpose of using interpoles in d.c. machines is to counteract
 i. the demagnetizing effect of armature m.m.f. in the commutating zone
 ii. the cross - magnetizing effect of armature m.m.f. in the commutating zone
 iii. the reactance voltage
 State which of the following is correct
 a. only (ii) and (iii) b. only (i) and (iii)
 c. only (ii) * d. only (iii)
491. A d.c. shunt generator has been developing rated voltage at rated speed. Match the statements in lists I and II and select correct answer using the code below:
 List - I
 a. The direction of rotation and residual magnetism are reversed
 b. The direction of rotation and connection of the field winding are reversed
 c. The direction of residual magnetism and field connections are reversed
 d. The direction of rotation residual magnetism and field connections are reversed.
 List - II
 I. The generator will not build up.
 II. The generator will build up with same polarity
 III. The generator will build up with reversed polarity
 Code :
 a. A B C D *
 III I II II
 b. A B C D
 I II I III
 c. A B C D
 I III I II
 d. A B C D
 III III I II
492. Rosenberg generator is a
 a. a constant current generator at high speeds and voltage polarity changes with the direction of rotation
 b. constant voltage generator at low speeds and voltage polarity is independent of the direction of rotation
 c. a constant voltage generator at low speeds and voltage polarity changes with the direction of rotation
 d. a constant current generator at high speeds and voltage polarity is independent of the direction of rotation *



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CHAPTER - 11

KNOWLEDGE OF CONSTRUCTION AND PRINCIPLES OF OPERATION OF SATURABLE REACTORS AND MAGNETIC AMPLIFIERS, BIAS, PHASE SENSITIVE HALF WAVES AND INPUTS AND OUTPUTS, PUSH PULL OUTPUTS AND EFFECTS OF STAGE GAINS AND CASCADING ON TIME RESPONSE

- RC coupling is used for _____ amplification
 - voltage *
 - current
 - power
 - none of these
- In an RC coupled amplifier, the voltage gain over mid-frequency range
 - changes abruptly with frequency
 - is constant*
 - changes uniformly with frequency
 - none of these
- In obtaining the frequency response curve of an amplifier, the _____
 - amplifier level output is kept constant
 - amplifier frequency is held constant
 - generator frequency is held constant
 - generator output level is held constant*
- An advantage of RC coupling scheme is the ____
 - good impedance matching
 - economy*
 - high efficiency
 - none of these
- The best frequency response is of _____ coupling
 - RC
 - transformer
 - direct*
 - none of these
- Transformer coupling is used for _____ amplification
 - power*
 - voltage
 - current
 - none of these
- In an RC coupling scheme, the coupling capacitor C_c must be large enough _____
 - to span d.c. between the stages
 - not to attenuate the low frequencies *
 - to dissipate high power
 - none of these
- In RC coupling, the value of coupling capacitor is about
 - 100 PF
 - 0.1 μ F
 - 0.01 μ f
 - 10 μ F*
- The noise facts of an ideal amplifier expressed in d.b. is
 - 0*
 - 1
 - 0.1
 - 10
- When a multi stage amplifier is to amplify d.c signal, then one must use _____ coupling.
 - RC
 - Transformer
 - direct *
 - none of the above
- _____ coupling provides the maximum voltage gain
 - RC
 - transformer *
 - direct
 - impedance
- In practice, voltage gain is expressed _____
 - in d.b.*
 - in volts
 - as a number
 - none of the above
- Transformer coupling provides high efficiency because _____
 - collector voltage is stepped up
 - d.c. resistance is low *
 - collector voltage is stepped down
 - none of these
- Transformer coupling is generating employed when load resistance is _____
 - large
 - very large
 - small*
 - none of these
- If a three stage amplifier has individual stage gains of 10 db, 5 db and 12 db then total gain db is
 - 600 db
 - 24 db
 - 14 db
 - 27 db*
- The final stage of a multistage amplifier uses _____
 - RC coupling
 - transformer coupling*
 - direct coupling
 - impedance coupling
- The ear is not sensitive to _____
 - frequency distortion*
 - amplitude distortion
 - frequency as well as amplitude distortion
 - none of these
- RC coupling is not used to amplify extremely low frequencies because

- a. there is considerable power loss
 b. there is hum in the output
 c. electrical rise of coupling capacitor becomes very large*
 d. none of these
19. In transistor amplifier, we use _____ transformer for impedance matching
 a. step up b. step down*
 c. same turn ratio d. none of these
20. The lower and upper cut off frequencies are also called _____ frequencies
 a. side band b. resonant
 c. half resonant d. half power*
21. A gain of 1000, 000 times in power is expressed by
 a. 30 db b. 60 db*
 c. 120 db d. 600 db
22. A gain of 1000 times in voltage is expressed by ____
 a. 60 db* b. 30 db
 c. 120 db d. 600 db
23. 1 db corresponds to _____ change in voltage or current level
 a. 40% b. 80%
 c. 20%* d. 25%
24. The frequency response of transformer coupling is
 a. good b. very good
 c. excellent d. poor*
25. In the initial stages of a multi stage amplifier we use _____
 a. RC coupling* b. transformer coupling
 c. direct coupling d. none of these
26. The total gain of a multistage amplifier is less than the product of the gain of individual stages due to ____
 a. Power less in the coupling device
 b. loading effect of next stage*
 c. the use of many transistor
 d. the use of many capacitors
27. The gain of an amplifier is expressed in db because _____
 a. It is a simple unit
 b. Calculations become easy
 c. human ear response is logarithmic*
 d. none of these
28. If the power level of an amplifier reduces to half the db gain will fall by
 a. 0.5 db b. 2 db
 c. 10 db d. 3 db*
29. A current amplification of 2000 is a gain of _____
 a. 3 db b. 66 db*
 c. 20 db d. 200 db
30. An amplifier receives 0.1 w of input and delivers 15 w of signal power what is the power gain in db
 a. 21.8 db* b. 13.6 db
 c. 9.5 db d. 17.4 db
31. The power output of an audio system is 18w. For a person to notice an increase in output of the system what must be the output of the power be increased
 a. 14.2 w b. 11.6 w
 c. 22.68 w* d. none of the above
32. The out put of a microphone is rated at 52 db. The ref level is 1 v under specified sound card. What is the output voltage of this microphone.
 a. 1.5 mv b. 6.2 mv
 c. 3.8 mv d. 2.5 mv*
33. RC coupling is generating confined to low power amplification because of
 a. large value of coupling capacitor
 b. low efficiency *
 c. large number of components
 d. none of the above
34. The no. of stages that can be directly coupled is limited because
 a. changes in temperature cause thermal instability*
 b. circuit becomes heavy and costly
 c. circuit d. none of these
35. The purpose of RC or transformer coupling is to _____
 a. block ac
 b. separate bias of one stage from another*
 c. increase thermal stability
 d. none of these
36. The upper or lower cut off frequency is also called _____ frequency
 a. resonant b. side band
 c. 3 db* d. none of these
37. The band width of a single stages amplifier is _____ that of a multistage amplifier
 a. more than* b. the same as
 c. less than d. data insufficient
38. The value of emitter capacitor C_E in a multistage amplifier is about _____
 a. 0.1 F b. 100 PF
 c. 0.01 μ F d. 50 μ F*
39. CC configuration is used for impedance matching because its _____
 a. input impedance is very high*
 b. input impedance is low
 c. output impedance is very low
 d. none of the above
40. For higher power gain, one would use _____ configuration

- load resistance respectively in a single stage transistor amplifier, then a.c. load is _____
- a. $R_L + R_C$ b. $R_C || R_E^*$
 c. $R_L - R_C$ d. R_C
64. If the power and current gains of a transistor amplifier are 16500 and 100 respectively the voltage gain is
 a. 165* b. 165×10^4
 c. 100 d. none of the above
65. In practice voltage of an amplifier is expressed
 a. as volts b. as a number
 c. in db* d. none of the above
66. In a CE amplification voltage gain = $\times \frac{R_{AC}}{R_{in}}$
 a. α b. $(1 + \alpha)$
 c. $(1 + \beta)$ d. β^*
67. In the d.c. equivalent circuit of a transistor amplifier, the capacitors are considered _____
 a. short b. open*
 c. partially short d. none of the above
68. The input capacitor in an amplifier is _____ capacitor
 a. coupling* b. bypass
 c. leakage d. none of the above
69. The point of intersection of d.c. and a.c. load lines is called _____
 a. saturation point b. cut off point
 c. operating pt* d. none of the above
70. The slope of a.c. load lines is _____ that of dc load line
 a. the same as b. more than*
 c. less than d. none of the above
71. In a transistor amplifier draws 2 mA when input voltage is 10 V, then its input impedance is _____
 a. 20 K Ω b. 0.2 K Ω
 c. 10 K Ω d. 5 K Ω^*
72. When a transistor amplifiers operating the current on any branch is
 a. sum of a.c. and d.c.* b. a.c. only
 c. d.c. only d. difference of a.c. and d.c.
73. The purpose of capacitors in a transistor amplifier is to _____
 a. protect the transistor b. cool the transistor
 c. couple or by pass a.c. comp*
 d. provide biasing
74. It is generally desired that a transistor should have _____ input impedance
 a. low b. very low
 c. high* d. very high
75. A single stage transistor amplifier contains _____ and associated circuitry
 a. two transistor b. one transistor*
 c. three transistor d. none of the above
76. The phase difference between the output and input voltage of a CE amplifier is
 a. 180°* b. 0° c. 90° d. 270°
77. In the zero signal conditions, a transformer sees _____ load
 a. d.c.* b. a.c.
 c. both d.c. and a.c. d. none of the above
78. If the collector supply is 10 V then collector cut off voltage under d.c. condition is
 a. 20 V b. 5 V c. 2 V d. 10 V*
79. When an ac signal is applied to an amplifier, the operating point moves along _____
 a. d.c. load line b. a.c. load line*
 c. both d.c. and a.c. load line
 d. none of the above
80. Class _____ power amplifier has the highest collector efficiency
 a. C* b. A c. B d. AB
81. Power amplifier handle _____ signal compared to voltage amplifiers
 a. small b. very small
 c. large* d. none of the above
82. In class A operation the operating point is generally located _____ of the d.c. load line
 a. at cut off point b. at the middle*
 c. at saturation point d. none of the above
83. Class C amplifiers are used as _____
 a. AF amplifiers b. large
 c. very large* d. none of the above
84. A power amplifier has comparatively _____ β
 a. small* b. large
 c. very large d. none of the above
85. The push pull circuit must use _____ operation
 a. class A b. Class C
 c. Class B* d. Class AB
86. The driver stage usually employs
 a. class A power amplifier*
 b. push pull amplifier
 c. class C amplifier d. none of the above
87. Servo motors should have
 a. two phase induction motor*
 b. three phase induction motor
 c. Synchronous motor
 d. None.

CHAPTER - 12

KNOWLEDGE OF CONSTRUCTION, PRINCIPLE AND OPERATION OF SERVOMOTORS AND RATE GENERATORS, SYSTEM RESPONSE TO DISPLACEMENT (POSITION) AND RATE (VELOCITY) COMPOUND SIGNALS, PURPOSE OF PULL UP AND RATE FEEDBACK SIGNALS, CAUSES OF HUNTING METHODS OF DAMPING, TROUBLE SHOOTING OF SERVOMECHANISM

1. The series d.c. servo motor has
 - a. high starting torque
 - b. poor speed regulation
 - c. either a. or b.
 - d. both a. and b. *
2. The d.c. shunt servo motor has a
 - a. poor starting torque
 - b. good starting torque
 - c. good speed regulation
 - d. both b. and c. *
3. The reversibility of a d.c. shunt servo motor is possible by
 - a. reversing armature or field polarity
 - b. using a split shunt winding
 - c. either a. or b. *
 - d. none of the above
4. The d.c. servo motors are usually
 - a. armature controlled with fixed field
 - b. field controlled with fixed armature current
 - c. either a. or b. *
 - d. none of the above
5. In the field controlled d.c. servo motor, the armature current is maintained constant by
 - a. applying a constant voltage source to the armature
 - b. inserting a very large resistance in series with armature
 - c. either a. or b.
 - d. both a. and b. *
6. For speed control system, the type of servo motor which is most suitable is
 - a. armature controlled d.c. servo motor
 - b. field controlled d.c. servo motor *
 - c. both a. and b.
 - d. none of the above
7. For instrument servo mechanisms, the servo motors which are commonly used is
 - a. armature controlled d.c. servo motor
 - b. field controlled d.c. servo motors
 - c. two-phase a.c. servo motors *
 - d. none of the above
8. The output power of two-phase a.c. servo motors generally used is
 - a. 2 to 100 watts *
 - b. 10 to 100 watts
 - c. 100 to 500 watts
 - d. 100 to 1000 watts
9. For large power servo mechanism, the servo motors which are normally used is
 - a. d.c. servo motors *
 - b. a.c. servo motors
 - c. either a. or b.
 - d. both a. and b.
10. In a two phase a.c. servo motors
 - a. both the windings are excited with a fixed voltage
 - b. both the windings are excited with a control voltage
 - c. one winding is excited by a fixed voltage and other winding by a control voltage *
 - d. none of the above
11. The stator windings of a two phase a.c. servo motor for the fixed and control phases are placed
 - a. 30° apart in space
 - b. 60° apart in space
 - c. 90° apart in space *
 - d. 120° apart in space
12. The fixed voltage winding of a two phase servo motor is excited from a source through a
 - a. inductor
 - b. capacitor *
 - c. resistor
 - d. none of the above
13. In the two phase servo motor, the direction of the rotation is determined by
 - a. the polarity of the fixed voltage
 - b. the polarity of the control voltage *
 - c. either a. or b.
 - d. none of the above

14. For low power applications, a.c. servo motors are preferred because of
 a. light in weight b. rugged construction
 c. no brush contacts d. all of the above *
15. Most of the a.c. servo motors used in the feed back control systems are of
 a. two phase induction type *
 b. three phase induction type
 c. repulsion type
 d. none of the above
16. The rotor of a two phase induction type servo motor can be
 a. squirrel cage type b. drag cup type
 c. solid iron type d. all of the above *
17. In a two phase a.c. servo motor, the rotor current produce a rotating field having the number of poles as
 a. same as that of the stator *
 b. half of as that of the stator
 c. double of as that of the stator
 d. none of the above
18. The operating speed of a two phase a.c. servomotor is determined by the
 a. windage friction b. load torques
 c. either a. or b. d. both a. and b. *
19. The diameter of the squirrel cage rotor of a two phase a.c. servomotor is made very small to
 a. increase inertia
 b. increase torque
 c. improve acceleration characteristics *
 d. none of the above
20. The solid iron rotor of a two phase a.c. servomotor is generally made of a magnetic material like
 a. cast iron b. wrought iron
 c. swedish iron * d. steel
21. The torque per watt input of a two phase a.c. servomotor with solid iron rotor is about
 a. 20% more than other rotor
 b. 20% less than other rotor *
 c. 5% more than other rotor
 d. 5% less than other rotor
22. The drag cup rotor of a two phase a.c. servomotor is shaped in the form of a cup and is generally made of
 a. iron b. copper
 c. aluminium d. either b. or c. *
23. It is common to design drag cup servomotors above 10 watts output with a
 a. fan attached to the frame *
- b. low torque
 c. high torque
 d. none of the above
24. Drag cup servomotors are available with adjustable
 a. air damping b. eddy current damping *
 c. fluid friction damping d. none of the above
25. The damping in a drag cup servomotor is varied by adjusting the
 a. strength of the magnetic field *
 b. size of the drag cup
 c. either a. or b.
 d. none of the above
26. Who introduced the term "Servomechanism" ?
 a. Hazen* b. Coulombs
 c. Newton d. Lenz
27. Term Servomechanism was introduced in
 a. 1934* b. 1834
 c. 1734 d. 1534
28. Servomechanism related with
 a. Position Control System *
 b. Velocity Control System
 c. Acceleration control System
 d. Linear Control System
29. A Servomechanism is a _____
 a. open loop system
 b. feed back control system *
 c. either a. or b.
 d. none of the above
30. In Servomechanism out put is some
 a. Electrical Position
 b. Mechanical Position*
 c. Electromechanical Position
 d. None of the above
31. In Servomechanism out put is
 a. Velocity
 b. Acceleration
 c. either velocity or acceleration*
 d. none of the above
32. The term Servomechanism is synonymous with
 a. Position Control* b. Velocity Control
 c. Acceleration Control d. None of the above
33. Servomechanism are extensively used in
 a. Modern industry* b. Cotton mills
 c. Sugar mills d. Every where
34. The objective type of Servomechanism is
 a. to control the position of the mechanical load*
 b. to control the velocity of the mechanical load
 c. either a. or b.
 d. none of the above

35. In Servomechanism a pair of potentiometer is used as an / a
- error detecting device
 - error measuring device *
 - clearing device
 - voltage source
36. In Servomechanism Potentiometer converts the input and output positions into
- Proportional electric signals*
 - Proportional magnetic signal
 - Proportional radio signal
 - Proportional electromagnetic signal
37. In Servomechanism output shaft position determines the _____
- angular position*
 - linear position
 - velocity
 - acceleration
38. An over damped system is always _____ in responding to any inputs
- very slow
 - slow
 - fast
 - sluggish*
39. Which of the following system exhibit fastest response
- under damped
 - over damped
 - critically damped*
 - undamped
40. Damping ratio of under damped system normally lies between
- 0.3 to 0.4
 - 0.5 to 0.8 *
 - 0.2 to 0.3
 - 0.4 to 0.6
41. In Servomechanism which of the following system gets close to the final value more rapidly.
- over damped system
 - under damped system *
 - critically damped
 - none of the above
42. The time required for the response to reach half the final value is called
- Delay time*
 - Rise time
 - Peak time
 - Settling time.
43. The time required for the response to reach the first peak of the overshoot
- Delay time
 - Rise time
 - Peak time*
 - Settling time
44. Time required for the response to rise from 10 to 90 %, 5 to 95 %, or 0 to 100 % of its final value is called
- Delay time
 - Rise time*
 - Peak time
 - Settling time
45. The maximum peak value of the response curve measured from unity is called
- Delay time
 - Rise time
 - Peak time
 - Maximum overshoot*
46. Time required for the response curve to reach and stay within a range about the final value of rise is called
- Delay time
 - Settling time*
 - Peak time
 - Rise time
47. Damping ratio for a critically damped system is
- 0
 - 1*
 - infinity
 - 10
48. Damping ratio of a over damped system is
- > 1*
 - < 1
 - = 1
 - 0
49. Damping ratio of a under damped system is
- > 1
 - < 1*
 - = 1
 - 0
50. Amplifier used in Servomechanism should have
- high input impedance
 - low output impedance *
 - low input impedance
 - high output impedance
51. Maximum acceleration is obtainable in which of the following motor
- D.C. Motor
 - Induction Motor
 - Servomotor*
 - A.C. Motor
52. For a given available torque the rotor moment of inertia for Servomotor must be
- moderate
 - maximum
 - minimum*
 - very higher
53. Servomotor operates under _____
- Constant load
 - Continuously varying condition*
 - Heavy load
 - Light load
54. In servomotor acceleration and deceleration of the rotor occur
- from time to time *
 - rarely
 - some times
 - never
55. The servomotor must be able to
- Absorb mechanical energy
 - Generate mechanical energy
 - both a. and b.*
 - none of the above
56. The performance of servomotor when used as a brake should be
- Unavailable
 - Uncomfortable
 - usual
 - satisfactory*
57. A two phase servomotor commonly used for _____
- instrument Servomechanism*
 - Servomechanism
 - Industry
 - aircraft

58. Two phase servomotor is similar to a
 a. D.C. Motor
 b. Single phase induction motor
 c. 2 Phase induction motor *
 d. 3 Phase induction motor
59. Two phase servomotor uses a
 a. squirrel cage rotor* b. round rotor
 c. spherical rotor d. cylindrical rotor
60. The rotor of two phase servomotor has a
 a. small length to diameter ratio
 b. small diameter to length ratio *
 c. small length
 d. small diameter
61. For servomotor small diameter to length ratio of the rotor is used to minimize the
 a. Velocity b. Moment of inertia*
 c. Acceleration d. None of the above
62. Good accelerating characteristics is obtained by using
 a. rotor of small dia to length ratio*
 b. rotor small length
 c. rotor small diameter
 d. none of the above
63. Two phase servomotor are _____
 a. soft b. rugged*
 c. hard d. none of the above
64. Two phase servomotor are
 a. non reliable b. reliable*
 c. economical d. unhealthy
65. In practical application the power range for which two phase servomotor are used is
 a. 100 w to 200 w
 b. 50 w to 100 w
 c. 25 w to 50 w
 d. a fraction of a watt and hundred watt*
66. In servomotor phase shift between control voltage and reference voltage is
 a. 30° b. 60°
 c. 90° * d. 120°
67. In two phase servomotor stator windings are normally excited by a _____ supply
 a. Single phase supply b. two phase supply*
 c. 3 phase supply d. D.C. supply
68. Servomotor is
 a. Reversible* b. Non reversible
 c. both a. and b. d. none of the above
69. In servomotor the angular speed at steady state is proportional to the
 a. fixed voltage b. reference voltage
 c. control voltage* d. supply voltage
70. In servomotor speed torque curves are _____ for a relatively wide speed range
 a. Perpendicular b. Parallel*
 c. Inclined d. Symmetrical
71. Servomotor _____ operates at high speeds
 a. usually b. frequently
 c. seldom* d. never
72. While assumption is made that curves are equidistant for all control voltages than the servomotor may be considered an
 a. Parabolic b. Ellipse
 c. nonlinear d. linear*
73. In low speed region of servo motor the torque speed characteristics are
 a. Parallel b. Perpendicular
 c. inclined d. Straight lines*
74. During calculation of transfer function assumption is made that a servomotor is _____
 a. non linear b. linear*
 c. straight line d. parabolic
75. Which of the following are more efficient
 a. Two phase servo motor *
 b. Series d.c. motor
 c. Long shunt d.c. motor
 d. short shunt d.c. motor
76. Basic parts of servo are / is
 a. A steady device giving an input signal called as reference input
 b. The controlled quantity
 c. Feed back path or element
 d. All the above*
77. Control system element _____ the signal
 a. receive and amplify the signal*
 b. send the signal
 c. detect the signal
78. The function of error detecting devices
 a. detect the error
 b. receive the signal
 c. amplify the signal
 d. receive the signal and compares it with the reference input signal*
79. Actuating signal is
 a. receiving signal
 b. amplifying signal
 c. difference between feed back signal and reference signal *
 d. controlled signal
80. Reference input is
 a. actuating signal
 b. a steady device giving an input signal *
 c. detecting signal
 d. error signal

81. In a good servo control system must include _____
 a. oscillator b. amplifier *
 c. capacitor d. adder
82. In servo the large power is controlled in
 a. oscillator b. amplifier *
 c. capacitor d. adder
83. In servo the controlled power is applied to a / an
 a. actuator * b. differentiator
 c. Integrator d. oscillator
84. Which of the following corrects the system error
 a. actuator * b. differentiator
 c. integrator d. oscillator
85. In servo the system error corrects by
 a. causing the right change in the reference signal
 b. causing the right change in the controlled quantity *
 c. any of the above
 d. none of these
86. The function of differential gear is
 a. control the signal
 b. detect the signal *
 c. compare the two speeds at its input shaft
 d. none of these
87. Electric bridge circuits are sensitive networks that compare _____
 a. two signals b. two voltages *
 c. two currents d. none of the above
88. Some servos compare mechanical measurements such as speed or fluid pressure, the resulting error can be changed into a corresponding electric signal the respective device is called
 a. differential gear b. Bimetal thermostat
 c. synchro d. Transducer *
89. Which of the following can be used as an error detector
 a. Transistor b. Differential gear
 c. Bimetal thermostat d. All the above *
90. Which of the following can be used as an error detector.
 a. Synchro b. Bridge circuits
 c. Bellows d. all the above *
91. The function of divider in the Servomechanism are
 a. To reduce the feed back signal *
 b. To increase the error
 c. To reduce the actuating signal
 d. To reduce the reference signal
92. While reference input is constant still servo need to give a correction. This is due to
 a. actuating signal
 b. introduced disturbance *
 c. output signal
 d. feed back signal
93. Normally servomotors are
 a. Single phase b. Two phase *
 c. Three phase d. without phase
94. Most important characteristics of servomotors are
 a. maximum acceleration * b. maximum torque
 c. maximum speed d. maximum inertia
95. For a given torque which motors have the least rotor moment of inertia
 a. servomotor *
 b. 1 ϕ induction motor
 c. 3 ϕ induction motor
 d. 3 ϕ synchronous motor
96. In two phase servomotor one phase of the motor is continuously excited from the
 a. Error voltage b. Reference voltage *
 c. actuating voltage d. feed back voltage
97. Frequency of the reference voltage is normally
 a. 50 cycles b. 400 cycles
 c. 100 cycles d. either a. or b. *
98. Which of the followings are servomotor.
 a. two phase servomotor
 b. armature controlled d.c. motors
 c. field controlled d.c. motors
 d. all the above *
99. The stator windings for the fixed and control phases are placed _____ apart in space
 a. 60° b. 90° *
 c. 120° d. 180°
100. In two phase servomotor phase-winding axes are _____
 a. Time quadrature b. Space quadrature *
 c. 180° apart d. 120° apart
101. In two phase servomotor, voltages in two phases are _____
 a. Time quadrature * b. Space quadrature
 c. 180° apart d. as earlier
102. In the two phase servomotor, the polarity of the control voltage determines the
 a. Error b. Direction of rotation *
 c. output signal d. actuating signal
103. In servomotor (two phase) torque is a function of
 a. Reference voltage b. Control voltage *
 c. Actuating voltage d. Feed back voltage
104. In servomotor (two phase) angular speed θ are also functions of
 a. Reference voltage b. Control voltage *
 c. actuating voltage d. feed back voltage
105. Armature controlled d.c motors employ a
 a. electromagnet b. permanent magnet *

- c. field magnet d. cylindrical magnet
106. Synchros are used in control system as
 a. Detectors b. Encoders
 c. amplifier d. a. and b. *
107. A synchros consists of
 a. control transformer b. control transmitter
 c. any of the above d. both a. and b. *
108. Which of the following consist a rotor and stator
 a. control transmitter * b. control transformer
 c. both a. and b. d. none of the above
109. The most commonly used error detectors are
 a. Selsyn b. Telesyn
 c. Circutrol d. all the above *
110. A differential gear is used as
 a. actuator b. error gear
 c. error detector * d. feed back gear
111. Differential transformer employs the principle
 a. electromagnetic
 b. electromagnetic induction *
 c. electrostatic induction
 d. non conducting
112. Oscillation die out more quickly while the damping torque is _____
 a. reduced b. increased *
 c. remain unaltered d. altered
113. When D is made so large that $\frac{D^2}{4J^2} = K/J$ then which of the following things occurs
 a. oscillation will reduce
 b. oscillation will increase
 c. oscillation will disappear *
 d. oscillation will reduce quickly
114. At the value of Damping torque where oscillation will disappear the system is called
 a. critically damped * b. over damped
 c. under damped d. undamped
115. Damping ratio is
 a. the ratio between actual system damping to the critical damping *
 b. the ratio between critical damping to actual system damping
 c. any of the above
 d. none of the above
116. The steady state error will be very small if
 a. load torque is small b. gain is large
 c. gain is made smaller d. both a. and b. *
117. Steady state error is
 a. Ratio of load torque with the gain *
 b. Ratio of gain with the load torque
- c. Ratio of actuating signal with the reference signal
 d. none of the above
118. If the viscous damping torque is zero which of the following will happen
 a. oscillation will disappears
 b. oscillation will reduce quickly
 c. system continuous to oscillate indefinitely *
 d. none of the above
119. Damping torque exist due to
 a. eddy current b. fly wheel
 c. viscous friction * d. none of the above
120. Transistor or vacuum tube is an / a
 a. Error detector * b. Amplifier
 c. Synchro d. Oscillator
121. Synchros is a / an
 a. Error detector * b. Amplifier
 c. Selsyn d. Oscillator
122. Bridge circuits is an / a
 a. Amplifier b. Error detector *
 c. selsyn d. oscillator
123. Bellows is a / an
 a. amplifier b. error detector *
 c. selsyn d. oscillator
124. In servo the reference input
 a. sets the desired level position *
 b. controlled quantity
 c. feed back path
 d. error
125. In force voltage analogy force relates with
 a. voltage * b. charge
 c. current d. power
126. In force voltage analogy mass relates with
 a. Capacitance b. Inductance *
 c. resistor d. current
127. In force voltage analogy viscous friction coefficient relates with
 a. capacitance b. resistance *
 c. inductance d. current
128. In force voltage analogy spring stiffness (k) relates with
 a. capacitance
 b. reciprocal of capacitance *
 c. inductance
 d. reciprocal of inductance
129. In force voltage analogy displacement relates with
 a. current b. voltage
 c. charge * d. current
130. In force voltage analogy velocity relates with

- a. Voltage b. Current *
- c. Inductance d. Capacitance
131. In force voltage analogy torque relates with
- a. voltage * b. current
- c. inductance d. capacitance
132. In force voltage analogy moment of inertia relates with
- a. capacitance b. inductance *
- c. resistance d. current
133. In force voltage analogy torsional spring stiffness relates with
- a. Reciprocal of capacitance *
- b. Reciprocal of Inductance
- c. Reciprocal of Resistor
- d. Reciprocal of voltage
134. In force voltage analogy Angular displacement relates with
- a. charge * b. current
- c. voltage d. spring constant
135. In force current analogy Angular velocity relates with
- a. charge b. current *
- c. voltage d. capacitor
136. In force current analogy force relates with
- a. voltage b. current *
- c. power d. charge
137. In force current analogy torque relates with
- a. voltage b. current *
- c. power d. charge
138. In force current analogy displacements relates with
- a. voltage b. current
- c. flux linkages * d. charge
139. In force current analogy velocity relates with
- a. voltage * b. current
- c. flux linkage d. charge
140. In force current analogy mass relates with
- a. Inductance b. capacitance *
- c. resistor d. charge
141. In force current analogy viscous friction coefficient relates with
- a. Reciprocal of inductances
- b. Reciprocal of capacitance
- c. Reciprocal of Resistance *
- d. Current
142. In force current analogy spring constant relates with
- a. Inductance
- b. Resistance
- c. Reciprocal of inductance *
- d. Capacitance
143. In force current analogy angular displacement relates with
- a. A flux linkages * b. Current
- c. voltage d. inductance
144. In force current analogy angular velocity relates with
- a. current b. voltage *
- c. charge d. inductance
145. In force current analogy moment inertia relates with
- a. Inductance b. Capacitance *
- c. resistance d. charge
146. In force current analogy torsional spring constant analogous with
- a. Reciprocal of capacitance
- b. Reciprocal of inductance *
- c. Reciprocal of Resistance
- d. Charge
147. The function of gear train is
- a. To transmit power from motor to load *
- b. To transmit power from load to motor
- c. To change the speed of the motor
- d. none of these
148. A system with no integration in the open loop transfer function is called
- a. Type 0 system * b. Type 1 system
- c. Type 2 system d. none of these
149. A system with one integration in open loop transfer function is called
- a. Type 0 system b. Type 1 system *
- c. Type 2 system d. none of these
150. A system with two integration in the open loop transfer function is called
- a. Type 0 system b. Type 1 system
- c. Type 2 system * d. none of these
151. Position error constant is defined for a _____
- a. unit ramp input b. unit step input *
- c. unit impulse d. unit parabolic input
152. Velocity error constant is defined for _____
- a. unit ramp input * b. unit step input
- c. unit impulse input d. unit parabolic input
153. Acceleration error constant is defined for
- a. unit ramp input b. unit step input
- c. unit impulse input d. unit parabolic input *
154. Position error constant has the dimension _____
- a. Sec⁻¹ B. Sec⁻²
- c. Sec d. None of these *
155. Velocity error constant has the dimension _____
- a. Sec⁻¹ * b. Sec
- c. Sec⁻² d. Sec²

- c. any of above
203. In which of the following metadynes and amplidyne are used
- high power application
 - high speed of response
 - solid state power amplifier
 - all the above *
204. The rotating amplifier are displaced by
- solid state power amplifier *
 - OPAM
 - D.C. motor
 - A.C. motor
205. Metadyne is the modification of
- A.C. Motor
 - D.C. Generator *
 - Induction generator
 - Synchronous generator
206. In Metadyne which of the following are done
- d-axis brushes are short circuited
 - q-axis brushes are short-circuited *
 - q-axis brushes are kept open
 - none of the above
207. In metadyne output is taken from
- q - axis brushes
 - d - axis brushes *
 - p - axis
 - none
208. In metadyne amplifier control field winding is placed in the
- Rotor
 - Stator *
 - Airgap
 - Shaft
209. Metadynes and amplidyne are _____
- a.c. m/c
 - oscillator
 - cross field generator *
 - actuators
210. In metadynes emf is induced
- due to the rotation of armature
 - due to the change of field flux
 - due to armature rotation in the quadrature axis flux *
 - none of the above
211. In metadyne due to the commutator action magnetic field becomes _____ in space
- rotates *
 - stationary
 - moving
 - none of the above
212. In metadynes emf appears across _____
- d-axis brush *
 - q-axis brush
 - either of a. or b.
 - none of the above
213. The common version of metadyne is _____
- D.C. generator
 - D.C. motor
 - A.C. generator
 - Amplidyne
214. In amplidyne the compensating winding is located in the
- q-axis
 - d-axis *
 - any of the above
 - none of the above
215. The terminal voltage of an amplidyne is
- very large
 - Very small
 - almost constant *
 - variable
216. Power amplification of amplidyne is
- of the order 10^5
 - of the order 10^4
 - of the order 10^2
 - of the order 10^6
217. Power amplification of which of the following is higher
- dc generator
 - amplidyne *
 - metadyne
 - none of the above
218. Which of the following behaves as a constant current generator
- Amplidyne
 - Metadyne *
 - D.C. generator
 - A.C. generator
219. Which of the following is / are rotating amplifier
- Amplidyne
 - Metadyne
 - both a. and b. *
 - OPAM
220. The cross field winding mmf induces an emf in metadyne
- When rotor is rotating at constant speed. *
 - when rotor is rotating at variable speed
 - either a. or b.
 - none of the above
221. Impedance in short circuited path is
- Very high
 - high
 - low
 - very low
222. The degree of compensation is defined as
- Ratio of effective compensating winding turn and effective armature turn *
 - Ratio of effective armature turn compensating winding turn
 - either a. or b.
 - none of the above
223. Degree of compensation of metadyne is
- 100% *
 - 50%
 - 0%
 - 25%
224. What is done to improve the performance of a amplidyne
- A series - connected quadrature axis winding is usually provided on the stator *
 - extra winding is connected
 - higher no of turns windings are used
 - none of the above
225. Which of the following is / are issued in Positional servomechanism
- Decoder *
 - Encoder
 - tachometer
 - None of the above
226. Rate gyros are commonly used in

- a. Steel industry b. Sugar industry
c. Computer d. aircraft auto pilot *
227. When feed forward method is useful of
a. If the disturbances the system output *
b. If there is no disturbance
c. If the disturbance are not measurable
d. none of the above
228. By feed forward method we control
a. output
b. reference input
c. undesirable effects of measurable disturbances *
d. none of these
229. Feed forward control minimizes the
a. position error b. velocity error
c. acceleration error d. transient error *
230. Transient errors are caused by
a. non measurement disturbances
b. measurable disturbances *
c. disturbance
d. none
231. Tachometer feed back is added with servomechanism to _____
a. accelerate the performance
b. improve the performance *
c. deaccelerate performance
d. none of the above
232. Improvement of servomechanism with the addition of tachometer feed back is
a. complicated
b. some what adjustable
c. easily adjustable *
d. non adjustable
233. Improvement of servomechanism with addition of tachometer feed back is
a. costlier b. economical *
c. somewhat costlier d. very cheap
234. A d.c tachometer is a _____
a. Motor b. Generator *
c. transconductor d. none of the above
235. D.C. tachometer is used as a _____
a. amplifier b. transformer
c. transducer * d. none of the above
236. Tachometer _____
a. converts the dc voltage into speed
b. converts electrical power into mechanical
c. converts the speed of the rotating shaft into a proportional d.c. voltage *
d. none of the above
237. D.C. tachometer can be used in
a. A.C. Servomechanism
- b. D.C. Servomechanism
c. both a.c. / d.c. Servomechanism *
d. none of the above
238. The tachometer used for damping purposes is usually built as an _____
a. multiple part of servomotor
b. integral part of servomotor *
c. higher power rating
d. none of the above
239. The ac tachometer is similar to that of
a. 1 ϕ induction motor
b. two phase induction motor *
c. 3 ϕ induction motor
d. none of the above
240. During measurement of speed of a shaft by means of a tachometer what will be the voltage while shaft is stationary
a. infinity b. one
c. zero * d. none
241. Velocity feed back has an effect of _____ the damping ratio
a. decreases b. slower
c. increasing * d. keeping constant
242. In d.c tachometer air gap flux is supplied by _____
a. Permanent magnet * b. Residual magnetism
c. Electromagnet d. None of the above
243. In any Servomechanism velocity signal can be easily generated by _____
a. tachometer b. Encoder
c. Decoder d. Transducer
244. Undamped natural frequency is not affected by _____
a. velocity * b. Position feed back
c. error d. error feed back
245. The derivatives of output signal in servomechanism can be used to _____ system performance
a. degrade b. deaccelerate
c. accelerate d. improve *
246. _____ is a discontinuous voltage signal
a. output of a potentiometer *
b. output of a oscillator
c. output of a d.c. generator
d. transducer
247. _____ is feed back to the input to produce the actuating error signal.
a. Velocity signal
b. Positional signal
c. Velocity signal, together with positional signal *
d. none of the above
248. Velocity feed back gives a similar improvement on the

- system performance as does
- Proportional feed back
 - derivative feed back
 - proportional-plus-derivative control action *
 - none of the above
249. Which motor generally make good a.c. tachometer
- 1 ϕ induction
 - 2 ϕ induction *
 - 1 ϕ motor
 - none of the above
250. Two windings of tachometer are displaced by
- 180° apart
 - 90° apart *
 - 30° apart
 - 60° apart
251. In tachometer polarity of output voltage is determined by the
- rotation
 - speed
 - Torque`
 - Direction of rotation *
252. Consider a system with damping ration 0.6 and natural frequency 5 rad/sec. The system is subjected to a unit of step input
- I The rise time of the system will be
- 0.45 sec
 - 0.55 sec *
 - 0.65 sec
 - 0.75 sec
253. II Peak time of the above system will be
- 0.75 sec
 - 0.785 sec *
 - 0.758 sec
 - 0.80 sec
254. III Maximum overshoot of the above system
- 9.5 % *
 - 10.5%
 - 8.5 %
 - 7.5 %
255. IV Setting time for 2 % criterion of the above system will be
- 1.39 sec
 - 1.33 sec *
 - 1.45 sec
 - 2.33 sec
256. V Setting time for 5 % criterion of the above system will be
- 1 sec *
 - 2 sec
 - 1.5 sec
 - 1.25 sec
257. VI Damped frequency of the above system will be
- 2
 - 3
 - 4 *
 - 5
258. The Dynamic behaviour of second order system can be described in terms of
- Damping ratio
 - natural frequency
 - both a. and b. *
 - none of the above
259. If damping ratio lies between 0 and 1 the closed loop poles are
- real
 - real and equal
 - complex congju ate *
 - complex
260. In the above case poles are lies
- in the left-half s plane *
 - in the right half s place
 - in the origin
 - Ist quadrant
261. If damping ratio lies between 0 and 1 the system is called
- under damped *
 - critically damped
 - over damped
 - undamped
262. If the system is under damped the system response will be
- oscillatory *
 - critically damped
 - over damped
 - die out quickly
263. If the system is critically damped the system response will be
- critically damped *
 - oscillatory
 - over damped
 - under damped
264. Transient response of over damped system
- do not oscillate *
 - oscillatory
 - die out quickly
 - none of the above
265. If damping ration is equal to one the system is called
- under damped
 - critically damped *
 - over damped
 - undamped
266. If damping ratio is greater than one the system is called
- under damped
 - over damped *
 - undamped
 - critically damped
267. Induction generator requiring _____ maintenance
- less *
 - more
 - quick
 - more
268. Which of the following generator can run without hunting
- Induction generator
 - synchronous generator
 - both a. and b. *
 - none of the above
269. An induction generator needs _____ auxiliary equipment
- little *
 - much
 - more
 - no
270. Out put of induction generator depends upon the _____ of the negative slip
- magnitude *
 - polarity
 - direction
 - torque
271. Induction generator has _____ rise per kw output power
- large
 - moderate
 - small *
 - very large
272. All physical plants are _____
- linear
 - parabolic
 - elliptical
 - nonlinear *
273. The basic factors which vary frequency occur in an

- arbitrary transfer function $G(j\omega) H(j\omega)$ are
- gain
 - integral and derivative factors
 - first order factors $(1+j\omega T) \pm 1$
 - all the above *
274. A number greater than unity has a _____ value in decibels
- positive value *
 - negative value
 - either a. or b.
 - none of the above
275. A number less than unity has a _____ value in decibels
- positive value
 - Negative value *
 - either a. or b.
 - none of the above
276. The advantages of open loop systems are
- such system are simple to design and hence economical
 - very much convenient when output is difficult to measure
 - easy from maintenance point of view
 - all the above *
277. The advantage of closed loop systems are
- accuracy
 - reduced effect of non linearity
 - such system sense environmental changes
 - all the above *
278. Advantages and disadvantages of feed back system are
- Increased accuracy
 - Reduced sensitivity
 - Increased bandwidth
 - all the above *
279. The Transfer function of a tachometer of the form
- KS^*
 - $\frac{K}{S}$
 - $\frac{K}{S+1}$
 - $\frac{K}{S(S+1)}$
280. Consider a unity feed back control system with open loop transfer function. $G(S) = \frac{K}{S(S+1)}$ The steady state error of the system due to a unit step input is
- zero *
 - K
 - 1/K
 - ∞
281. Servomotor is a
- Errordetector
 - Transducer
 - Actuator *
 - Power amplifier
282. Amplidyne is a
- Errordetector
 - Transducer
 - Actuator
 - Power amplifier *
283. Potentiometer is a _____
- Errordetector *
 - Transducer
- Actuator
 - Power amplifier
284. Flapper valve is a
- Errordetector
 - Transducer *
 - Actuator
 - Power amplifier
285. The purpose of series quadrature windings in an amplidyne is to
- Neutralise the effect of armature reaction
 - Reduce commutation difficulties
 - increase the gain *
 - increase the responses time
286. A synchro transmitter receiver unit is a
- Two phase ac device
 - 3 phase a.c. device
 - d.c. device
 - single phase a.c. device *
287. In position control system, the device used for providing rate - feedback voltage is called
- Potentiometer
 - Synchro-transmitter
 - synchro-transformer
 - tachogenerator *
288. The a.c. motor used in servo application is a
- single phase induction motor
 - two phase induction motor *
 - three phase induction motor
 - synchronous motor
289. For a two phase servomotor which of the followings statements is not true ?
- The rotor diameter's small
 - The rotor resistance is small *
 - The applied voltage are seldom balanced
 - The torque speed characteristics are linear
290. The phase lead compensation is used to
- increase rise time and decrease over shoot
 - decrease both rise time and over shoot
 - increase both rise time and over shoot
 - decrease rise time and increase over shoot *

FILL IN THE BLANKS

- The field controlled shunt d.c. servomotor requires _____ control power. (**little**, maximum)
- The starting torque of a d.c. series servomotor is _____. (**high**, low)
- A d.c. series servomotor draws _____ starting current. (**large**, small)
- The reversed of a d.c. split series servomotor can be obtained by reversing _____ voltage polarity with spilt series winding. (**field**, armature)
- In case of a d.c. series servo-motor when the field is splited it _____ the efficiency of the motor. (**reduces**, increases)

6. In case of a d.c. shunt servo-motor when the field is split it _____ the efficiency of the motor. (**reduces**, increases)
7. The d.c. servo-motors are much more _____ than two phase a.c. servo-motors. (**efficient**, non-efficient)
8. The d.c. servo-motors are generally having _____ excited field. (**separately**, self)
9. In the armature controlled d.c. servo-motor, the field current is held _____. (**constant**, variable)
10. In the armature controlled d.c. servo-motor the torque is directly proportional to the _____ current. (**armature**, field)
11. When the armature of an armature controlled d.c. servo-motor is rotating, the induced voltage in the armature is directly proportional to the _____. (**angular velocity**, flux)
12. The speed of an armature controlled d.c. servo-motor is controlled by _____ voltage (**armature**, field)
13. In case of an armature controlled d.c. servo-motor, the back e.m.f. _____ the effective damping of the system. (**increases**, decreases)
14. In the field controlled d.c. servo-motor the armature current is kept _____. (**constant**, variable)
15. In the field controlled d.c. servo-motor the armature current is maintained constant by applying a constant voltage to armature and by inserting a very large resistance in _____ with the armature. (**series**, parallel, series-parallel)
16. Maintaining a constant armature current is more _____ than maintaining a constant field current. (easy, **difficult**)
17. While comparing with an armature controlled d.c. servo-motor the power requirement for a field controlled d.c. servo-motor is _____. (**low**, high)
18. While comparing with an armature controlled d.c. servo-motor the heat generated in the armature of a field controlled d.c. servo-motor is _____. (**more**, less)
19. The time constants of the field-controlled d.c. servomotors are generally _____ compared with the time constants of an armature-controlled motor. (**large**, small)
20. Most important among the characteristics of the servo-motor is the _____ acceleration obtainable. (minimum, **maximum**)
21. The two-phase a.c. servo-motors with more than 100 watts power rating are _____. (much efficient, **not much efficient**)
22. In the two-phase a.c. servo-motors, the voltages applied to the two windings are at _____ angles to one another. (30° , 60° , **90°**)
23. In a two-phase a.c. servo-motor, with rotor stationary, the frequency of rotor currents and stator currents are _____. (**same**, different)
24. In servo applications the reference winding of a two-phase a.c. servo-motor is excited _____. (**continuously**, intermittently)
25. In a two-phase a.c. servo-motor the torque is proportional to the product of the stator and rotor field strengths _____ by the angle between them. (**multiplied**, divided)
26. In a two-phase a.c. servo-motor if the control winding voltage is reduced the torque of the motor is _____. (**reduced**, increased, remain same)
27. Two-phase a.c. servo-motors are designed for small value of resistance, so that _____ torque occurs for small values of the slip. (**maximum**, minimum)
28. The diameter of the squirrel cage rotor of a two-phase a.c. servo-motor is made very small to _____. (increase, **reduce**)
29. Frequently it is possible to stabilize a feedback system by adding viscous _____ to the servo motor shaft. (**damping**, controlling)
30. In a drag cup servomotor damping is accomplished by the relative motion between a low inertia drag cup connected to the _____ and a fixed magnetic field. (stator, **rotor**)
31. In a drag cup servomotor the drag is created by _____. (**eddy current**, back emf, control voltage)
32. Under certain conditions the drag cup servomotor is capable of running when only the fixed voltage is excited and control voltage is zero and this is known as _____. (**single-phasing**, transfer function).

■■■

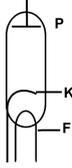
CHAPTER - 13

KNOWLEDGE OF BASIC PRINCIPLE OF THERMIONICS

1. The outermost orbit of an atom can have a maximum of electrons.
 - a. 8 *
 - b. 6
 - c. 4
 - d. 3
2. When the outermost orbit of an atom has less than 4 electrons, the material is generally a
 - a. non-metal
 - b. metal *
 - c. semiconductor
 - d. none of above
3. The valence electrons have
 - a. very small energy
 - b. least energy
 - c. maximum energy *
 - d. none of the above
4. A large number of free electrons exist in
 - a. semiconductor
 - b. metals *
 - c. insulators
 - d. non-metals
5. An ideal voltage source has internal resistance
 - a. small
 - b. large
 - c. infinite
 - d. zero *
6. An ideal current source has internal resistance
 - a. infinite *
 - b. zero
 - c. small
 - d. none of the above
7. Maximum power is transferred if load resistance is equal to of the source
 - a. half the internal resistance
 - b. internal resistance *
 - c. twice the internal resistance
 - d. none of the above
8. Efficiency at maximum power transfer is
 - a. 75%
 - b. 25%
 - c. 90%
 - d. 50% *
9. When the outermost orbit of an atom has exactly 4 valence electrons, the material is generally
 - a. a metal
 - b. a non-metal
 - c. a semiconductor *
 - d. an insulator
10. Thevenin's theorem replaces a complicated circuit facing a load by an
 - a. ideal voltage source and parallel resistor
 - b. ideal current source and parallel resistor
 - c. ideal current source and series resistor
 - d. ideal voltage source and series resistor *
11. The output voltage of an ideal voltage source is
 - a. zero
 - b. constant *
 - c. dependent on load resistance
 - d. dependent on internal resistance
12. The current output of an ideal current source is
 - a. zero
 - b. constant *
 - c. dependent on load resistance
 - d. dependent on internal resistance
13. Norton's theorem replaces a complicated circuit facing a load by an
 - a. ideal voltage source and parallel resistor
 - b. ideal current source and parallel resistor *
 - c. ideal voltage source and series resistor
 - d. ideal current source and series resistor
14. The practical example of ideal voltage source is
 - a. lead-acid cell *
 - b. dry cell
 - c. Daniel cell
 - d. none of the above
15. The speed of electrons in vacuum is than in a conductor
 - a. less
 - b. much more *
 - c. much less
 - d. none of the above
16. Maximum power will be transferred from a source of 10 W resistance to a load of
 - a. 5W
 - b. 20W
 - c. 10W*
 - d. 40W
17. When the outermost orbit of an atom has more than 4 electrons, the material is generally a
 - a. metal
 - b. non-metal *
 - c. semiconductor
 - d. none of the above
18. An ideal source consists of 5 V in series with 10 kW resistance. The current magnitude of equivalent current source is
 - a. 2 mA
 - b. 3.5 mA
 - c. 0.5 mA *
 - d. none of the above
19. To get Thevenin voltage, you have to
 - a. short the load resistor
 - b. open the load resistor *
 - c. short the voltage source
 - d. open the voltage source
20. To get the Norton current, you have to
 - a. short the load resistor *
 - b. open the load resistor
 - c. short the voltage source
 - d. open the voltage source
21. The open-circuited voltage at the terminals of load R_L in a network is 30 V. Under the conditions of maximum power transfer, the load voltage will be
 - a. 30V
 - b. 10V
 - c. 5V
 - d. 15 V *

22. Under the conditions of maximum power transfer, a voltage source is delivering a power of 30 W to the load. The power produced by the source is
- 45 W
 - 60 W *
 - 30 W
 - 90 W
23. The maximum power transfer theorem is used in
- electronic circuits *
 - power system
 - home lighting circuits
 - none of the above
24. The Norton resistance of a network is 20 W and the shorted - load current is 2 A. If the network is loaded by a resistance equal to 20 W, the current through the load will be
- 2 A
 - 0.5 A
 - 4 A
 - 1 A *
25. The Norton current is sometimes called the
- shorted-load current*
 - open-load current
 - Thevenin current
 - Thevenin voltage
26. One electron-volt equals
- 1.6×10^{19} J
 - 1.6×10^{-19} J *
 - 9.11×10^{-34} J
 - 9.11×10^{-34} J
27. A photon signifies a quantum of energy equals to
- $1/hv$
 - hv *
 - $1/h^2 V$
 - $h^2 V$
28. An excited electron in an atom returns to the ground state
- always by single jump
 - always by two jumps
 - always by single or more jumps *
29. The number of protons in the nucleus of an atom is called its
- mass number
 - atomic number *
 - atomic weight
30. The protons and neutrons in the nucleus are called
- atoms
 - isotopes
 - atomic weight
 - nucleons *
31. The number of protons and neutrons of an atom is called
- atomic weight *
 - atomic number
 - molecular weight
 - mass number
32. The atomic number and weight of an element are 11 and 2, the number of neutrons in the nucleus are
- 11
 - 23
 - 34
 - 12 *
33. The principal quantum number refers to
- an orbital
 - an orbit *
 - a sub-shell
34. The principal quantum number n for shell-L is
- 1
 - 2 *
 - 3
 - 4
35. If E_1, E_2, E_3, E_4 refer to the energy levels of k, L, M and N shells respectively, then
- $E_1 > E_2 > E_3 > E_4$
 - $E_1 < E_2 < E_3 < E_4$ *
 - $E_1 < E_2 > E_3 < E_4$
36. The maximum number of electrons in an orbit is
- n
 - 2n
 - $2n^2$ *
 - n^2
37. The total number of electrons in K-orbit are
- 2 *
 - 8
 - 18
 - 32
38. The atom of an element consists of small positively charged central core, called
- nucleus *
 - positive charge
 - negative charge
39. The number of electrons in an atom are equal to
- protons *
 - neutrons
 - positrons
 - photons
40. The average radii of any atoms are of the order of
- 10^{-6} m
 - 10^{-8} m *
 - 10^{-10} m
41. The radii of nuclei of any atoms is of the order of
- 10^{-8} to 10^{-11} m
 - 10^{-10} to 10^{-11} m *
 - 10^{-10} to 10^{-12} m
42. The nucleus of hydrogen contain only one
- proton *
 - positron
 - neutron
43. The nuclei of all atoms other than the hydrogen contains
- proton and photons
 - protons and neutrons *
 - photons and neutrons
44. The energy radiated/absorbed from the orbits of any element is
- any multiple of quanta
 - an integral multiple of quanta *
 - not integral multiple of quanta
45. Electrons in the outermost orbit are called
- valence electrons *
 - conduction electrons
 - excited electrons
46. The basic constituents of all matters are
- electrons *
 - atoms
 - positrons
 - nucleus
47. A neutral atom must have equal numbers of
- electrons and neutrons *
 - electrons and protons
 - protons and neutrons
48. The valence electrons occupy the
- innermost orbit
 - outermost orbit *
 - empty orbit

49. The mean life of an excited electron is in the range of
 a. 10^{-6} s to 10^{-10} s b. 10^{-7} s to 10^{-10} s *
 c. 10^{-7} s to 10^{-11} s d. None
50. The total energy of revolving electrons in hydrogen atom is
 a. $\frac{e^2}{8\pi\epsilon_0 r}$ b. $\frac{-e^2}{8\pi\epsilon_0 r}$ *
 c. $\frac{e^2}{8\pi\epsilon_0 r^2}$ d. None
51. The radius of orbit in an atom is
 a. $r = \frac{h^2\epsilon_0}{\pi m e^2}$ * b. $r = \frac{h^2\epsilon_0}{m n e^2 \pi}$
 c. $r = \frac{h^2\epsilon_0}{m n^2 e^2 \pi}$ d. $r = \frac{h^2\epsilon_0}{m e^2 \pi} (n)$
52. The total energy of revolving electrons in hydrogen atom is
 a. $\frac{-13.6}{n^2}$ eV * b. $\frac{-13.6}{n}$ eV
 c. $\frac{13.6}{n^2}$ eV d. $\frac{13.6}{n}$ eV
53. The ionization energy of hydrogen atom is
 a. 0.848 eV b. -13.6 eV *
 c. 1.36 eV d. 3.39 eV
54. The wavelength of radiated emission when an electron fall from E_2 energy level to E_1 is
 a. $\frac{12,400}{E_2 - E_1}$ * b. $\frac{12,400}{E_1 - E_2}$
 c. $\frac{E_2 - E_1}{12,400}$ d. $\frac{E_1 - E_2}{12,400}$
55. Thermionic valves is also called:
 a. Vacuum Tube * b. Cathode Ray Tube
 c. Both d. None
56. Vacuum tube are used to generate:
 a. High power radio wave
 b. High power audio wave
 c. High power video wave
 d. Above all *
57. Vacuum tube has:
 a. Two electrodes b. Three electrodes
 c. Four electrodes d. Not certain *
58. Two plate cathode and anode is used in:
 a. Vacuum tube b. CRT *
 c. Both d. None
59. Emission of electron by means of:
 a. Anode b. Cathode *
 c. Both d. None
60. Emission of electron by:
 a. Heating the cathode * b. Heating the anode
 c. Both d. None
61. If a body thrown upward, it come back to earth due to:
 a. Centrifugal force b. Centripetal force
 c. Gravitational force * d. None
62. Rocket or Spaceship is launched on:
 a. Escape velocity * b. Normal velocity
 c. Velocity of light d. Above all
63. The highest energy of electron in a metal at absolute zero temperature is known as:
 a. Fermi level of energy *
 b. Kinetic energy
 c. Both
 d. None
64. Work function of metal:
 a. Additional energy needed *
 b. Less energy needed
 c. Both
 d. Nothing to be said
65. "ev" is abbreviated as:
 a. Electron volt * b. Electron vacuum
 c. Emission volume d. All
66. The "ev" is a unit of:
 a. Energy b. Power
 c. Voltage * d. Current
67. The value of "ev" is:
 a. 1.6×10^{-19} j * b. 1.6×10^{19} j
 c. 1.6×10^{-10} j d. 1.6×10^{-4} j
68. We can supply the additional energy for electron emission is:
 a. Heat b. Electric field
 c. Light d. All *
69. If heat is applied for electron emission it is called:
 a. Thermionic emission *
 b. High field emission
 c. Photo electric emission
 d. All
70. In high field emission, we provide:
 a. Heat
 b. Electric field *
 c. Light
 d. Thrust produced by bombarding the surface with electronic
71. When light is used to emit the electron known as:
 a. Photoelectric emission *
 b. High field emission

- c. Both
d. None
72. Secondary emission is known when:
a. Heat is applied
b. Electric field is applied
c. Thrust produced by bombarding the surface with electron *
d. All
73. Most widely used:
a. Thermionic emission *
b. High field emission
c. Photoelectric emission
d. Secondary emission
74. Metal have:
a. Low work function * b. High work function
c. Both d. None
75. Oxide coated is used to handle the:
a. Small power b. High power *
c. Both d. None
76. Thoriated tungsten is used to handle:
a. Medium power * b. Very high power
c. Low power d. All
77. Pure tungsten is used to handle:
a. Very high power * b. Medium power
c. Low power d. All
78. Whenever we have to require medium power we use:
a. Thoriated tungsten * b. Pure tungsten
c. Oxide tungsten d. All
79. For handling very large power we use:
a. Pure tungsten * b. Thoriated tungsten
c. Oxide coating d. None
80. Cathode are basically:
a. Indirectly heated * b. Directly heated
c. Both d. None
81. The heater current passes directly through the cathode:
a. Directly heated * b. Indirectly heated
c. Both d. None
82. The heater current passes through a resistance wire mounted inside a hollow cylinder cathode:
a. Directly heated b. Indirectly heated *
c. Both d. None
83. All the points the filament are not at same potential:
a. Directly heated cathode *
b. Indirectly heated cathode
c. Both
d. None
84. All the points potential is same:
a. Indirectly heated cathode *
- b. Directly heated cathode
c. Both
d. All
85. Surrounding the cathode is another cylinder made of nickel acts as a:
a. Protector b. Anode
c. Grid * d. All
86. Symbol of 
a. Diode * b. Transistor
c. FET d. MOSFET
87. The cloud of electron around the cathode known as:
a. Space charge * b. Ground charge
c. Both d. None
88. Space charge is:
a. -ve * b. +ve
c. Neutral d. None
89. The voltage beyond which current start saturating is called:
a. Knee voltage b. Saturation voltage *
c. Both d. None
90. At the saturation point space charge exist around the:
a. cathode b. Anode
c. Both d. None *
91. The plate current remains almost constant, the current is known as:
a. Temperature limited current *
b. Temperature unlimited current
c. Normal current
d. None
92. We can reduce the temperature of cathode by:
a. Reducing the filament current *
b. Increasing the filament current
c. Both
d. None
93. "Langmuir-Child" three half power law:
a. $i_p = kv_p^{3/2}$ b. $i_p = kv_p^{2/3}$
c. $i_p = kv_p^{1/3}$ d. $i_p = kv_p^3$ *
* 'k' is the proportionality constant
94. Saturation current depends upon:
a. Temperature of cathode *
b. Temperature of anode
c. Both
d. None
95. Richardson - Dushman's equation:
a. $I = A_0 S T^2 e^{bo/T}$ b. $I = A_0 S T^3 e^{bo/T}$
c. $I = A_0 S T^3 e^{bo/T}$ d. $I = A_0 S T^3 e^{T/bo}$ *

* A_0 - Constant, S - Cathode area,
 T - Temperature in K

96. Dynamic plate resistance:
 a. The reciprocal of the slope of characteristic curve in the o/p resistance.*
 b. proportional of the slope of characteristic curve in the o/p resistance.
 c. Square root of the slope of characteristic curve in the o/p resistance.
 d. None
97. Dynamic plate resistance:
 a. $r_p = Dv_p / Di_p$ * b. $r_p = Di_p / Dv_p$
 c. $r_p = Dv_p \cdot Di_p$ d. $r_p = (Dv_p)^{Di_p}$
98. Space charge formed around the cathode of a vacuum tube is:
 a. -ve *h b. +ve
 c. Neutral d. None
99. The cathode of thermionic tube is always heated by passing on:
 a. Electric current *r b. Electric voltage *
 c. Electric field d. None
100. Inserting another electrode between cathode and plate known as:
 a. Grid *i b. Cathode
 c. Anode d. None
101. Grid is kept very near to:
 a. Cathode * b. Anode
 c. Both d. None
102. _____ can control the plate current in much better way:
 a. Grid * b. Cathode
 c. Anode d. None
103. _____ consist of grid, cathode, and anode.
 a. Triode tube * b. Diode tube
 c. Tetrode tube d. Pentode tube
104. Work function of metals is generally measured in _____.
 a. joules b. electron volt *
 c. watt - hour d. watt
105. The operating temperature of an oxide coated emitter is about
 a. 750 °C * b. 1200 °C
 c. 2300 °C d. 3650 °C
106. _____ is used in high voltage (> 10 kV) applications
 a. tungsten emitter * b. oxide - coated emitter
 c. thoriated tungsten emitter d. none of the above
107. A desirable characteristic of an emitter is that it should have work function
 a. large b. very large
 c. small * d. none of the above
108. The thermionic emitter that has the highest operating temperature is
 a. oxide - coated b. thoriated - tungsten
 c. tungsten * d. none of the above
109. If the temperature of an emitter is increased two times, the electron emission is
 a. increased two times
 b. increased four times
 c. increased several million times *
 d. none of the above
110. In X - ray tubes, emitter is used.
 a. tungsten b. thoriated tungsten *
 c. oxide - coated d. none of the above
111. The first Brillouin zone for a simple cubic lattice is a cube.
 a. 5 faces b. 12 faces
 c. 8 corners d. 12 edges
112. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. 1 V * b. 4 V
 c. 2 V d. 4 V
113. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. 1 V * b. 4 V
 c. 2 V d. 4 V
114. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. 1 V * b. 4 V
 c. 2 V d. 4 V
115. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. tungsten b. thoriated tungsten *
 c. oxide - coated d. none of the above
116. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. 1 V * b. 4 V
 c. 2 V d. 4 V
117. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. 1 V * b. 4 V
 c. 2 V d. 4 V
118. The electron emission in a thermionic tube is controlled by the grid voltage.
 a. 1 V * b. 4 V
 c. 2 V d. 4 V

CHAPTER - 14

SEMICONDUCTOR

1. A semiconductor is formed by bonds.
 - a. covalent *
 - b. electrovalent
 - c. co-ordinate
 - d. none of the above
2. A semiconductor has temperature co-efficient of resistance
 - a. positive
 - b. zero
 - c. negative *
 - d. none of the above
3. The most commonly used semiconductor is
 - a. germanium
 - b. silicon *
 - c. carbon
 - d. sulphur
4. A semiconductor has generally valence electrons.
 - a. 2
 - b. 3
 - c. 6
 - d. 4 *
5. The resistivity of pure germanium under standard conditions is about
 - a. 6×10^4 W cm
 - b. 60 W cm *
 - c. 3×10^6 W cm
 - d. 6×10^{-4} W cm
6. The resistivity of pure silicon is about
 - a. 100 W cm
 - b. 6000 W cm *
 - c. 3×10^5 W cm
 - d. 1.6×10^{-8} cm
7. When a pure semiconductor is heated, its resistance
 - a. goes up
 - b. goes down *
 - c. remains the same
 - d. cannot say
8. The strength of a semiconductor crystal comes from
 - a. forces between nuclei
 - b. forces between protons
 - c. electron-pair bonds *
 - d. none of the above
9. When a pentavalent impurity is added to a pure semiconductor, it becomes
 - a. an insulator
 - b. an intrinsic semiconductor
 - c. p-type semiconductor
 - d. n-type semiconductor *
10. Addition of pentavalent impurity to a semi-conductor creates many
 - a. free electrons *
 - b. holes
 - c. valence electrons
 - d. bound electrons
11. A pentavalent impurity has valence electrons.
 - a. 3
 - b. 5 *
 - c. 4
 - d. 6
12. An n-type semiconductor is
 - a. positively charged
 - b. negatively charged
 - c. electrically neutral *
 - d. none of the above
13. A trivalent impurity has valence electronics.
 - a. 4
 - b. 5
 - c. 6
 - d. 3 *
14. Addition of trivalent impurity to a semiconductor creates many
 - a. holes *
 - b. free electrons
 - c. valence electrons
 - d. bound electrons
15. A hole in a semiconductor is defined as
 - a. a free electron
 - b. the incomplete part of an electron pair bond *
 - c. a free proton
 - d. a free neutron
16. The impurity level in an extrinsic semiconductor is about of pure semiconductor
 - a. 10 atoms for 10^8 atoms
 - b. 1 atom for 10^8 atoms *
 - c. 1 atom for 10^4 atoms
 - d. 1 atom for 100 atoms
17. As the doping to a pure semiconductor increases, the bulk resistance of the semiconductor
 - a. remains the same
 - b. increases
 - c. decreases *
 - d. none of the above
18. A hole and electron in close proximity would tend to
 - a. repel each other
 - b. attract each other *
 - c. have no effect on each other
 - d. none of the above
19. In a semiconductor, current conduction is due
 - a. only to holes
 - b. only to free electrons
 - c. to holes and free electrons *
 - d. none of the above
20. The random motion of holes and free electrons due to thermal agitation is called
 - a. diffusion *
 - b. pressure
 - c. ionisation
 - d. none of the above
21. A forward biased pn junction has a resistance of the
 - a. order of W *
 - b. order of kW

- c. order to MW d. none of the above
22. The battery connections required to forward bias a pn junction are
- +ve terminal to p and -ve terminal to n *
 - ve terminal to p and +ve terminal to n
 - ve terminal to p and -ve terminal to n
 - none of the above
23. The barrier voltage at a pn junction for germanium is about
- 3.5V
 - 3V
 - zero
 - 0.3 V *
24. In the depletion region of a pn junction, there is a shortage of
- acceptor ions
 - holes and electrons *
 - donor ions
 - none of the above
25. A reverse biased pn junction has
- very narrow depletion layer
 - almost no current *
 - very low resistance
 - large current flow
26. A pn junction acts as a
- controlled switch
 - bidirectional switch
 - unidirectional switch *
 - none of the above
27. A reverse biased pn junction has resistance of the
- order of W
 - order of kW
 - order of MW *
 - none of the above
28. The leakage current across a pn junction is due to
- minority carries *
 - majority carries
 - junction capacitance
 - none of the above
29. When the temperature of an extrinsic semiconductor is increased, the pronounced effect is on
- junction capacitance
 - minority carries *
 - majority carries
 - none of the above
30. With forward bias to a pn junction, the width of depletion layer
- decreases *
 - increases
 - remains the same
 - none of the above
31. The leakage current in a pn junction is of the order of
- A
 - mA
 - kA
 - mA *
32. In an intrinsic semiconductor, the number of free electrons
- equals the number of holes *
 - is greater than the number of holes
 - is less than the number of holes
 - none of the above
33. At room temperature, an intrinsic semiconductor has
- many holes only
 - a few free electrons and holes *
 - many free electrons only
 - no holes or free electrons
34. At absolute temperature, an intrinsic semiconductor has
- a few free electrons
 - many holes
 - many free electrons
 - no holes or free electrons *
35. At room temperature, an intrinsic silicon crystal acts approximately as
- a battery
 - a conductor
 - an insulator *
 - a piece of copper wire
36. A crystal diode has
- one pn junction *
 - two pn junction
 - three pn junction
 - none of the above
37. A crystal diode has forward resistance of the order of
- kW
 - W *
 - MW
 - None of the above
38. If the arrow of crystal diode symbol is positive w.r.t. bar, then diode is biased.
- forward *
 - reverse
 - either forward or reverse
 - none of the above
39. The reverse current in a diode is of the order of
- kA
 - mA
 - mA *
 - A
40. The forward voltage drop across a silicon diode is about
- 2.5V
 - 3V
 - 10V
 - 0.7V *
41. A crystal diode is used as
- an amplifier
 - a rectifier *
 - an oscillator
 - a voltage regulator
42. The d.c. resistance of a crystal diode is its a.c. resistance
- the same as
 - more than
 - less than *
 - none of the above

43. An ideal crystal diode is one which behaves as perfect when forward biased
 a. conductor * b. insulator
 c. resistance material d. none of the above
44. The ratio of reverse resistance and forward resistance of a germanium crystal diode is about
 a. 1 : 1 b. 100 : 1
 c. 1000 : 1 d. 40000 : 1 *
45. The leakage current in a crystal diode is due to
 a. minority carriers * b. majority carriers
 c. junction capacitance d. none of the above
46. If the temperature of a crystal diode increases, then leakage current
 a. remains the same b. decreases
 c. increases * d. becomes zero
47. The PIV rating of a crystal diode is that of equivalent vacuum diode
 a. the same as b. lower than *
 c. more than d. none of the above
48. If the doping level of a crystal diode is increased, the breakdown voltage
 a. remains the same
 b. is increased
 c. is decreased *
 d. none of the above
49. The knee voltage of a crystal diode is approximately equal to
 a. applied voltage
 b. breakdown voltage
 c. forward voltage
 d. barrier potential *
50. When the graph between current through and voltage across a device is a straight line, the device is referred to as
 a. linear * b. active
 c. nonlinear d. passive
51. When the crystal diode current is large, the bias is
 a. forward * b. inverse
 c. poor d. reverse
52. A crystal diode is a device.
 a. non-linear * b. bilateral
 c. linear d. none of the above
53. A crystal diode utilises characteristics for rectification.
 a. reverse b. forward *
 c. forward or reverse d. none of the above
54. When a crystal diode is used as a rectifier, the most important consideration is
 a. forward characteristics
 b. doping level
 c. reverse characteristics
 d. PIV rating *
55. If the doping level in a crystal diode is increased, the width of depletion layer
 a. remains the same
 b. is decreased
 c. is increased *
 d. none of the above
56. A zener diode has
 a. one pn junction *
 b. two pn junctions
 c. three pn junctions
 d. none of the above
57. A zener diode is used as
 a. an amplifier b. a voltage regulator *
 c. a rectifier d. a multivibrator
58. The doping level in a zener diode is that of a crystal diode
 a. the same as b. less than
 c. more than * d. none of the above
59. A zener diode is always connected.
 a. reverse *
 b. forward
 c. either reverse or forward
 d. none of the above
60. A zener diode utilises characteristics for its operation
 a. forward
 b. reverse *
 c. both forward and reverse
 d. none of the above
61. In the breakdown region, a zener diode behave like a source
 a. constant voltage * b. constant current
 c. constant resistance d. none of the above
62. A zener diode is destroyed if it
 a. is forward biased
 b. is reverse biased
 c. carries more than rated current *
 d. none of the above
63. A series resistance is connected in the zener circuit to
 a. properly reverse bias the zener
 b. protect the zener *
 c. properly forward bias the zener
 d. none of the above
64. A zener diode is device
 a. a non-linear * b. a linear
 c. an amplifying d. none of the above

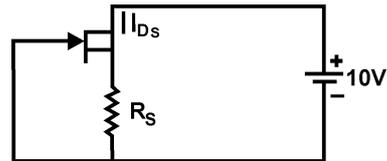
65. A zener diode has breakdown voltage.
 a. undefined b. sharp *
 c. zero d. none of the above
66. rectifier has the lowest forward resistance.
 a. solid state * b. vacuum tube
 c. gas tube d. none of the above
67. Mains a.c. power is converted into d.c. power for
 a. lighting purposes
 b. heaters
 c. using in electronic equipment *
 d. none of the above
68. The disadvantage of a half-wave rectifier is that the
 a. components are expensive
 b. diodes must have a higher power rating
 c. output is difficult to filter *
 d. none of the above
69. If the a.c. input to a half-wave rectifier has an r.m.s. value of $400/\sqrt{2}$ volts, then diode PIV rating is
 a. $400/\sqrt{2}$ V b. 400 V *
 c. $400 \times \sqrt{2}$ V d. None of the above
70. The ripple factor of a half-wave rectifier is
 a. 2 b. 1.21
 c. 2.5 d. 0.48 *
71. There is a need of transformer for
 a. half-wave rectifier
 b. centre-tap full-wave rectifier *
 c. bridge full-wave rectifier
 d. none of the above
72. The PIV rating of each diode in a bridge rectifier is that of the equivalent centre-tap rectifier.
 a. one - half * b. the same as
 c. twice d. four times
73. For the same secondary voltage, the output voltage from a centre-tap rectifier is than that of bridge rectifier
 a. twice b. thrice
 c. four times d. one-half *
74. If the PIV rating of a diode is exceeded,
 a. the diode conducts poorly
 b. the diode is destroyed *
 c. the diode behaves as zener diode
 d. none of the above
75. A 10 V power supply would use as filter capacitor.
 a. paper capacitor b. mica capacitor
 c. electrolytic capacitor * d. air capacitor
76. A 1000 V power supply would use as a filter capacitor
 a. paper capacitor * b. air capacitor
 c. mica capacitor d. electrolytic capacitor
77. The filter circuit results in the best voltage regulation.
 a. choke input * b. capacitor input
 c. resistance input d. none of the above
78. A half-wave rectifier has an input voltage of 240 V r.m.s. If the step-down transformer has a turns ratio of 8 : 1, what is the peak load voltage ? Ignore diode drop.
 a. 27.5 V b. 86.5 V
 c. 30 V * d. 42.5 V
79. The maximum efficiency of a half-wave rectifier is
 a. 40.6% * b. 81.2%
 c. 50% d. 25%
80. The most widely used rectifier is
 a. half-wave rectifier
 b. centre-tap full-wave rectifier
 c. bridge full-wave rectifier *
 d. none of the above
81. The potential barrier across a p-n junction is due to
 a. negative and positive charge carrier on the same side.
 b. immobile donor and acceptor ions *
 c. negative and positive charge carriers on opposite sides.
82. Depletion voltage is
 a. more for Ge b. more for Si *
 c. equal in Si and Ge
83. Depletion voltage increases with
 a. forward bias b. reverse bias *
 c. without forward and reverse biases
84. Depletion width has
 a. negative charge carrier
 b. positive charge carrier
 c. no charge carriers *
85. Depletion width with forward bias
 a. increases b. decreases *
 c. remains constant
86. Junction capacitance with increasing reverse bias
 a. increases * b. decreases
 c. remains constant
87. Forward bias across p-n junction means
 a. only positive terminal connected to p-type,
 b. positive terminal connected to p and negative to n, *
 c. positive terminal connected to n and negative to p.

88. In an unbiased p-n junction current does not flow because
- carriers do not cross the junction *
 - equal and opposite charge carriers cross the junction.
 - same type of charge carriers cross the junction in opposite direction.
89. Diffusion current is due to
- different concentrations of same type of charge carriers in same region
 - different concentrations of same type of charge carriers in different regions *
 - same concentrations in two regions
90. Total current through any p-n junction is only due to
- drift of charge carriers
 - diffusion of charge carriers
 - same concentration in two regions *
91. The forward current in p-n junction increases rapidly
- from zero onwards
 - only after the value of potential barrier *
 - when the depletion area becomes equal to space charge area
92. Zener breakdown refers to
- forward bias region
 - reverse bias region *
 - no bias region
93. Avalanche breakdown voltage is
- lower than Zener is
 - higher than Zener *
 - equal to Zener breakdown voltage is
94. Zener breakdown depends on
- electric field created across the depletion region *
 - velocity of the carries
 - no. of donor ions
 - no. of acceptor ions
95. Both avalanche and Zener breakdown are commonly known as
- Zener breakdown *
 - avalanche breakdown
 - current breakdown
96. Zener diodes are
- specially doped p-n junction *
 - normally doped p-n junction
 - lightly doped p-n junction
97. Zener diodes are used as
- reference voltage elements *
 - reference current elements
 - reference resistance
98. The reverse saturation current with increasing reverse bias
- increases *
 - decreases
 - remains constant
99. The magnitude of reverse saturation current is
- less than forward current *
 - larger than forward current
 - equal to forward current
100. With rise in temp. Reverse saturation current
- increases linearly
 - increases exponentially *
 - decreases linearly
101. With increasing temperature, the junction voltage
- increases
 - decreases *
 - remains constant
102. The current of a Semiconductor diode is expressed as
- $I_0 (\exp^{qV/KT}-1) *$
 - $I_0 KT$
 - I_0 / KV
 - $I_0 (\exp^{-qV/KT}-1)$
103. The dynamic resistance of a diode is expressed as
- $25 \text{ m V/I (mA) } *$
 - $1/25 \text{ mV}$
 - $V/I \text{ (A)}$
104. Potential barrier for Ge p-n junction is
- $0.2 \text{ V} *$
 - 0.02 V
 - 0.02 V
 - 0.7 V
105. Potential barrier across Si diode is
- 0.2 V
 - $0.7 \text{ V} *$
 - 1.0 V
106. The voltage drop across ideal diode is
- 0.2 V
 - 0.7 V
 - $0 \text{ V} *$
107. Resistance of an ideal diode is
- very large
 - zero *
 - small
108. The current flow in a diode is
- unidirectional *
 - bi-directional
 - none of these
109. Diode is
- polar sensitive device *
 - nonpolar sensitive device,
 - bipolar sensitive device
110. Diode can be used as a
- amplifier
 - rectifier *
 - filter
111. V-I characteristics of diode can result in
- static resistance only *
 - dynamic resistance only
 - none of these
112. Diffusion current in p-n junction is influenced
- by concentration gradient of carriers *
 - applied voltage
 - concentration of carriers

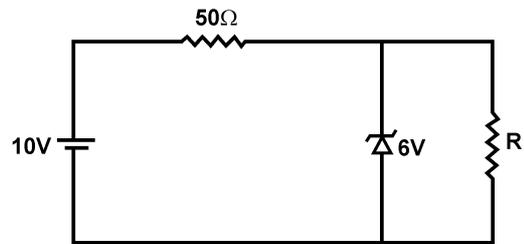
113. Drift current is influenced by
 a. magnitude of voltage *
 b. concentration of carriers
 c. concentration gradient of carriers
114. Increasing reverse bias
 a. decreases the junction capacitor
 b. increases the junction capacitor *
 c. has no effect on its capacitor
115. Junction capacitance is related with barrier potential as
 a. $C = KV^{-1/2}$ * b. $C = KV^{1/2}$
 c. $C = KV$ d. $C = K/V$
116. Reverse break down in p-n junction at high temperature occurs
 a. at higher reverse bias b. at lowest reverse bias
 c. at forward bias *
117. The reverse saturation current I of Si diode varies as
 a. T^2 b. T^3
 c. $T^{1/2}$ d. $T^{3/2}$ *
118. A semiconductor is irradiated with light such that carriers are uniformly generated throughout its volume. The semiconductor is n-type with $N_D = 10^{19}$ per cm^3 . If the excess electron concentration in the steady state is $\Delta n = 10^{15}$ per cm^3 and if $\tau_p = 10\mu$ sec., (minority carrier life time) the generation rate due to irradiation
 a. is 10^{20} e-h pairs / cm^3 / s *
 b. is 20^{24} e-h pairs / cm^3 / s
 c. is 10^{10} e-h pairs / cm^3 / s
 d. cannot be determined as the given data is insufficient
119. A p-n junction in series with a 100 ohms resistors, is forward biased so that a current of 100mA flows. If the voltage across this combination is instantaneously reversed to 10 V at $t = 0$, the reverse current that flows through the diode at $t = 0$ is approximately given by
 a. 0 mA b. 100 mA *
 c. 200 mA d. 50 mA
120. An infra-red LED is usually fabricated from
 a. Ge b. Si
 c. Ga As d. Ga As P *
121. In a transistors having finite, the forward bias across the base-emitter junction is kept constant and the reverse bias across the collector base-junction is increased. Neglecting the leakage across the collector-base junction and the depletion region generation current, the base current will
 a. increase b. decrease *
 c. remain constant d. none of the above
122. An n-channel JFET has a pinch-off voltage of $V_0 = -5V$, $V_{D_s}(\text{max}) = 20$ V, $g_m = 2\text{mA/V}$. The minimum 'ON' resistance is achieved in the JFET for

- a. $V_{G_s} = -7V$ and $V_{D_s} = 0V$
 b. $V_{G_s} = 0V$ $V_{D_s} = 0V$
 c. $V_{G_s} = 0V$ and $V_{D_s} = 20V$ *
 d. $V_{G_s} = -7V$ and $V_{D_s} = 20V$

123. The JFET in a circuit shown in figure, has an $I_{DSS} = 10\text{mA}$ and $V_p = -5V$. The value of the resistance R_s for a drain current $I_{D_s} = 6.4$ mA is (select the nearest value)
 a. 150 ohms * b. 470 ohms
 c. 560 ohms d. 1 kilo-ohms



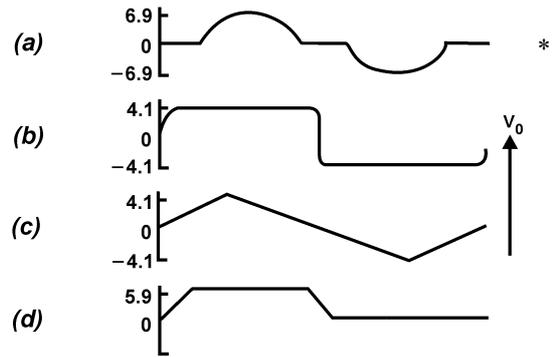
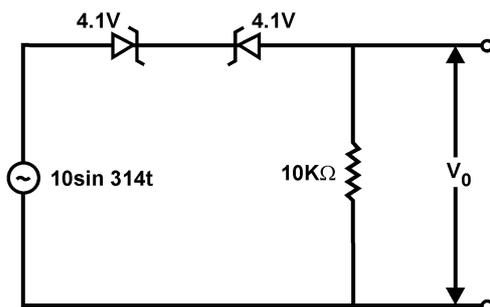
124. The 6V zener diode shown in the figure, has zero zener resistance and a knee current of 5mA. The minimum value of R so that the voltage across it does not fall below 6 V is



- a. 1.2k ohms b. 80 ohms *
 c. 50 ohms d. 0 ohms

125. In a common Emitter amplifier, the unbypassed emitter resistance provides
 a. voltage-shunt feedback
 b. current-series feedback *
 c. negative-voltage feedback
 d. positive-current feedback
126. In an RC-coupled Common Emitter amplifier
 a. coupling capacitance affects the h_f response and bypass capacitance affects the I_f response
 b. both coupling and bypass capacitances affect the h_f response only
 c. both coupling and bypass capacitances affect the h_f response only
 d. coupling capacitance affects the I_f response and the bypass capacitance affects the h_f response *
127. The built in potential (diffusion potential) in a p-n junction
 a. is equal to the difference in the Fermi level of the two sides, expressed in volts *
 b. increases with the increase in the doping levels of the two sides
 c. increases with the increases in temperature
 d. all of these

128. a - cut off frequency of a bipolar junction transistor
- increases with the increase in base width
 - increases with increase in the collector width *
 - increases with the increase in temperature
 - increases with decrease in the base width
129. Negative feedback in amplifiers
- improves the signal to noise ratio at the input
 - improves the signal to noise ratio at the output
 - does not affect the signal to noise ratio at the output
 - reduces distortion
 - both b & d *
130. In a multi-stage R-C coupled amplifier the coupling capacitor
- limits the low frequency response *
 - limits the high frequency response
 - does not affect the frequency response
 - block the d.c. component without affecting the frequency response
131. The bandwidth of an n-stage tuned amplifier, with each having a bandwidth of B, is given by
- $\frac{B}{n}$
 - $\frac{B}{\sqrt{n}}$
 - $B\sqrt{2^{1/n} - 1}$ *
 - $B/\sqrt{2^{1/n} - 1}$
132. In a transistor push-pull amplifier
- there is no d.c presents in the output
 - there is no distortion in the output
 - there are no even harmonics in the output
 - there are no odd harmonics in the output
 - both a. and c.*
133. A small concentration of minority carriers is injected into a homogeneous semiconductor crystal at one point. An electric field of 10V/cm is applied across the crystal (in cm² / volt sec.) of the minority carriers is
- 1000
 - 2000
 - 5000 *
 - 500,000
134. The waveshape of V_o in the figure below will be



135. The threshold voltage of an n-channel MOSFET can be increased by
- increasing the channel doping concentration
 - reducing the channel doping concentration *
 - reducing the gate oxide thickness
 - reducing the channel length
136. A class- A transformer coupled, transistor power amplifier is required to deliver a power output of 10 Watts. The maximum power rating of the transistor should not be less than
- 5 W
 - 10 W
 - 20 W *
 - 40 W
137. The transit time of the current carriers through the channel of an FET decides its _____ characteristics.
- Switching *
 - On/Off
 - Dynamic
 - Load
138. In order to reduce the harmonic distortion in an amplifier its dynamic range has to be
- Controlled
 - Expanded
 - Compressed *
 - Modified
139. A common emitter transistor amplifier has a collector current of 1.0 mA when its base current is 25 mA at the room temperature. It's input resistance is approximately equal to
- 10 ohms
 - 100 ohms
 - 1000 ohms *
 - 10,000 ohms
140. For the 2N 338 transistor, the manufacturer specifies P_{max} = 100 mW at 25° C free-air temperature and the maximum junction temperature, T_{jmax} = 125° C. Its thermal resistance is
- 10° C/W
 - 100° C/W
 - 1000° C/W *
 - 10,000° C/W
141. A p-type silicon sample has a higher conductivity compared to an n-type sample having the same dopant concentration
- True
 - False *
142. Channel current is reduced on application of a more positive voltage to the gate of a depletion mode n-channel MOSFET.
- True
 - False *

143. Match each of the items A, B and C with and appropriate item from 1,2,3,4 and 5.
 (A) The current gain of BJT will be increased if
 (B) The current gain of BJT will be reduced if
 (C) The break-down voltage of a BJT will be reduced if
 1. The collector doping concentration is increased
 2. The base width is reduced
 3. The emitter doping concentration to base doping concentration ratio is reduced
 4. The base doping concentration is increased keeping the ratio of the emitter doping concentration to base doping concentration, constant
 5. The collector doping concentration is reduced.

Codes :

	A	B	C
(a)	2	3	1 *
(b)	2	1	3
(c)	3	1	2
(d)	1	2	3

144. Match each of the items A, B and C in List-I with appropriate item from List - II and select the correct answer from the codes given below

List - I

- (A) Hartley
 (B) Wien-Bridge
 (C) Crystal

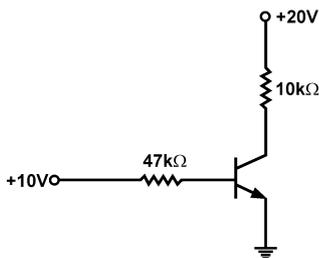
List - II

1. Low frequency oscillator
 2. High frequency Oscillator
 3. Stable frequency Oscillator
 4. Relaxation oscillator
 5. Negative resistance oscillator

Codes :

	A	B	C
(a)	2	1	3
(b)	2	5	4
(c)	1	2	5 *
(d)	4	3	1

145. In the transistor circuit shown in figure below, collector-to-ground voltage is +20 V. Which of the following is the Probable cause of error ?
 a. Collector-emitter terminals shorted
 b. Emitter to ground connection open *
 c. 10 ohms resistor open
 d. collector - base terminals shorted



146. A switched mode power supply operating at 20 kHz to 100kHz range uses as the main switching element is
 a. Thyristor
 b. MOSFET *
 c. Triac
 d. UJT

147. The drift velocity of electrons, in silicon
 a. is proportional to the electric field for all values of electric field
 b. is independent of the electric field
 c. increases at low values of electric field and decreases at high values of electric field exhibiting negative differential resistance
 d. increases linearly with electric field at low values of electric field and gradually saturates at higher value of electric field *

148. The diffusion potential across a p-n junction
 a. decreases with increasing doping concentration
 b. increases with decreasing band gap
 c. does not depend on doping concentration
 d. increases with increase in doping concentrations*

149. The break down voltage of a transistor with its base open is BV_{CEO} and that with emitter open is BV_{CBO} , then
 a. $BV_{CEO} = BV_{CBO}$
 b. $BV_{CEO} > BV_{CBO}$
 c. $BV_{CEO} < BV_{CBO}$ *
 d. BV_{CEO} is not related to BV_{CBO}

150. In a p-type silicon sample, the hole concentration is $2.25 \times 10^{15}/\text{cm}^3$. If the intrinsic carrier concentration is $1.5 \times 10^{10}/\text{cm}^3$, the electron concentration is
 a. zero
 b. $10^{10}/\text{cm}^3$
 c. $10^5/\text{cm}^3$ *
 d. $1.5 \times 10^{25}/\text{cm}^3$

151. A zener diode works on the principle of
 a. tunnelling of charge carriers across the junction
 b. thermionic emission
 c. diffusion of charge carriers across the junction *
 d. hopping of charge carriers across the junction

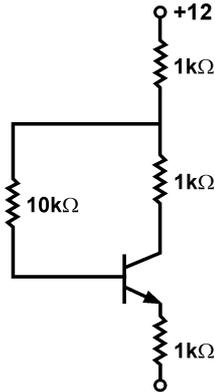
152. A BJT is said to be operating in the saturation region if
 a. both the junctions are reverse biased
 b. base-emitter junction is reverse biased and base-collector junction is forward biased
 c. base-emitter junction is forward biased and base-collector junction is reverse-biased
 d. both the junctions are forward biased *

153. The depletion capacitance, C_J , of an abrupt p-n junction with constant doping on either side varies with reverse bias V_R , as
 a. $C_J \propto V_R$
 b. $C_J \propto V_R^{-1}$
 c. $C_J \propto V_R^{-1/2}$ *
 d. $C_J \propto V_R^{-1/3}$

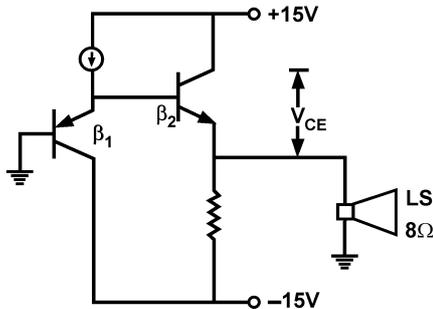
154. A change in the value of the emitter resistance R_e , in a difference amplifier
 a. affects the difference mode gain, A_d
 b. affects the common mode gain, A_c *
 c. affects both A_d and A_c
 d. does not affect either A_d and A_c

- 155. The Ebers-Moll model is applicable to
 - a. bipolar junction transistors *
 - b. NMOS transistors
 - c. unipolar junction transistors
 - d. junction field-effect transistors
- 156. To obtain very high input and output impedances in a feedback amplifier, the topology, mostly used is
 - a. voltage-series
 - b. current-series *
 - c. voltage -shunt
 - d. current
- 157. A transistor having $a = 0.99$ and $V_{BE} = 0.7$ V, is used in the circuit shown figure. The value of the collector current will be

- a. 5.33 mA *
- b. 6.9 mA
- c. 7.23 mA
- d. 8.8 mA



- 158. The circuit shown in the figure supplies power to an 8 ohms speaker, LS. The values of I_C and V_{CE} for this circuit will be
 $I_C = \underline{\hspace{2cm}}$ and $V_{CE} = \underline{\hspace{2cm}}$
 - a. $I_C = 7.325$ A, $V_{CE} = 0.7$ V *
 - b. $I_C = 6.325$ A, $V_{CE} = 0.7$ V
 - c. $I_C = 6.325$ A, $V_{CE} = 0.51$ V
 - d. $I_C = 7.325$ A, $V_{CE} = 0.51$ V



- 159. An npn transistor under forward-active mode of operation is biased at $I_c = 1$ mA, and has a total emitter-base capacitance C_k of 12 pF, and the base transit time τ_F of 260 psec. Under this condition, the depletion capacitance of the emitter-base junction is
 - a. 0.2 pF
 - b. 0.6 pF
 - c. 1 pF
 - d. 2 pF *
- 160. An RC-coupled amplifier is assumed to have a single-pole low frequency transfer function. The maximum lower-cut off frequency allowed for the amplifier to pass 50 Hz square wave with not more than 10% tilt is
 - a. 1 Hz
 - b. 1.59 Hz *
 - c. 1 kHz
 - d. 1.59 kHz

- 161. A power amplifier delivers 50 W output at 50% efficiency. The ambient temperature is 25° C. If the maximum allowable junction temperature is 150°, then the maximum thermal resistance θ_{jc} that can be tolerated is
 - a. 25° C/W
 - b. 20° C/W
 - c. 5° C/W *
 - d. 1° C/W
- 162. An amplifier has an open-loop gain of 100, and its lower- and upper-cut-off frequency of 100 Hz and 100 kHz, respectively. A feedback network with a feedback factor of 0.99 is connected to the amplifier. The new lower and upper-cut-off frequencies are at
 - a. $f_H = 10$ MHz and $f_L = 1$ Hz *
 - b. $f_H = 25$ MHz and $f_L = 10$ Hz
 - c. $f_H = 100$ MHz and $f_L = 100$ Hz
 - d. $f_H = 10$ MHz and $f_L = 10$ Hz
- 163. An n-channel JFET has $I_{DSS} = 1$ mA and $V_p = -5$ V. Its maximum transconductance is
 - a. 0.1 milli mho
 - b. 0.4 milli mho *
 - c. 1.0 milli mho
 - d. 4.0 milli mho

- 164. Match the each of the items A, B and C with and appropriate item from 1,2,3,4 and 5 In a bipolar junction transistor
 - (A) the current gain increases
 - (B) the collector break-down voltage increases
 - (C) the cut-off frequency increases
 1. the base doping is increased and the base width is reduced
 2. the base doping is reduced and the base width is increased
 3. the base doping and the base width are reduced
 4. the emitter area is increased and the collector area is reduced
 5. the base doping and the base width are increased

Codes :

	A	B	C
(a)	1	2	4
(b)	5	4	1
(c)	3	1	1 *
(d)	2	4	5

- 165. Match each of the items A, B and C with appropriate item from 1,2,3,4 and 5. In a JFET
 - (A) the pinch-off voltage decreases
 - (B) the transconductance increase
 - (C) the transit time of the carriers in the channel is reduced
 1. the channel doping is reduced
 2. the channel length is increased
 3. the conductivity of the channel increased
 4. the channel length is reduced
 5. the Gate area is reduced

Codes :

A	B	C
---	---	---

- (a) 1 4 5 *
- (b) 2 1 3
- (c) 3 2 1
- (d) 4 3 2

166. Match each of the items A, B and C with and appropriate item from 1,2,3,4 and 5. In an extrinsic semiconductor

- (A) the resistivity decreases
 - (B) the temperature coefficient of resistivity is negative
 - (C) the photo conductivity is low
1. the doping concentration is low
 2. the length of the semiconductor is reduced
 3. the band gap is high
 4. the area of cross-section of the semiconductor is increased
 5. the doping concentration is increased

Codes :

- | | | | |
|-----|---|---|-----|
| | A | B | C |
| (a) | 3 | 3 | 1 |
| (b) | 5 | 5 | 3 * |
| (c) | 2 | 4 | 5 |
| (d) | 4 | 1 | 2 |

167. Match each of the item A, B and C with the appropriate item from 1,2,3,4 and 5.

- (A) Common-collector amplifier
 - (B) Common-emitter amplifier
 - (C) Common-base amplifier
1. Provides voltage gain but no current gain
 2. Provides current gain but no voltage gain
 3. Provides neither voltage nor power gain
 4. Provides neither current nor power gain
 5. Provides both voltage and current gain

Codes :

- | | | | |
|-----|---|---|-----|
| | A | B | C |
| (a) | 5 | 3 | 1 |
| (b) | 2 | 5 | 2 |
| (c) | 4 | 1 | 2 |
| (d) | 2 | 5 | 1 * |

168. The p-type substrate in a conventional pn junction isolated integrated circuit should be connected to

- a. nowhere, i.e. left floating
- b. a dc ground potential
- c. the most positive potential available in the circuit
- d. the most negative potential available in the circuit*

169. If a transistor is operating with both of its junctions forward bias greater than the emitter-base forward bias, then it is operating in the

- a. forward active mode
- b. reverse saturation mode *
- c. reverse active mode
- d. forward saturation mode

170. The common-emitter short-circuit current gain of a transistor

- a. is a monotonically increasing of the collector current I_c .
- b. is a monotonically decreasing function I_c

- c. increases with I_c for low I_c , reaches a maximum, and then decreases in I_c *
- d. is not a function of I_c

171. An n-channel silicon ($E_g = 1.1\text{eV}$) MOSFET was fabricated using n + poly silicon gate and the threshold voltage was found to be IV. Now, if the gate is changed to P poly-silicon, other things remaining the same, the new threshold voltage should be

- a. -0.1 V
- b. 0V
- c. 1.0 V *
- d. 2.1 V

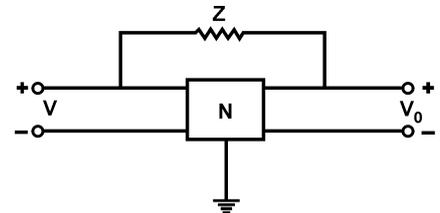
172. In the circuit shown in the figure, N is a finite gain amplifier with a gain of k, a very large input impedance, and a very low output impedance. the input impedance of the feedback amplifier with the feedback impedance Z connected, as shown will be

a. $Z\left(1 - \frac{1}{k}\right)$

b. $Z(1 - k)$

c. $\frac{Z}{k - 1}$

d. $\frac{Z}{(1 - k)}$ *



173. In a bipolar transistor at room temperature, if the emitter current is doubled, the voltage across its base-emitter junction

- a. doubles
- b. halves
- c. increases by about 20 mV *
- d. decreases by about 20 mV

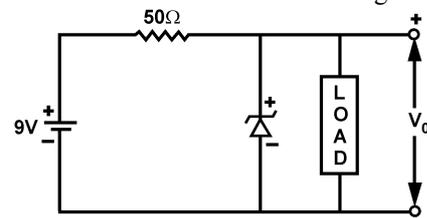
174. A npn transistor has beta cut off frequency f_β of a 1 MHz, and common-emitter short-circuit low-frequency current gain b_0 of 200. Its unity gain frequency of f_T and the alpha cut off frequency f_α respectively are

- a. 200 MHz, 201 MHz *
- b. 200 MHz, 199 MHz
- c. 199 MHz, 200 MHz
- d. 201 MHz, 200 MHz

175. A zener diode in the circuit shown in the figure below, has a knee current of 5 mA, and a maximum allowed power dissipation of 300 mW. What are the minimum and maximum load currents that can be drawn safely from the circuit, keeping the output voltage V_0 at 6V ?

- a. 0 mA, 180 mA
- b. 5 mA, 110 mA
- c. 10 mA, 55 mA *
- d. 60 mA, 180 mA

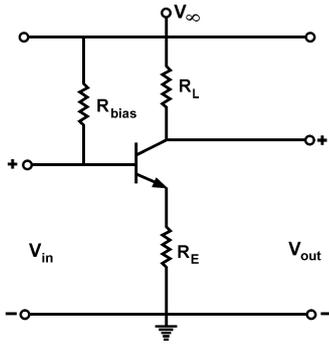
176. In the BJT amplifier shown in the figure, the transistor is biased in the forward active region. Putting a



capacitor across R_E will

- a. decreases the voltage gain and decrease the input impedance
- b. increase the voltage gain and decrease the input impedance *
- c. decrease the voltage gain and increase the input impedance
- d. increase the voltage gain and increase the input impedance

177. A cascade amplifier stage is equivalent to



- a. a common emitter stage followed by a common base stage *
- b. a common base stage followed by an emitter follower
- c. an emitter follower stage followed by a common base stage
- d. a common base stage followed by a common emitter stage

178. For a MOS capacitor fabricated on a p type semiconductor, strong inversion occurs when

- a. surface potential is equal to Fermi potential
- b. surface potential is zero
- c. surface potential is negative and equal to Fermi potential in magnitude
- d. surface potential is positive and equal to twice the Fermi potential *

179. In a common emitter BJT amplifier, the maximum usable supply voltage is limited by

- a. Avalanche breakdown of Base-Emitter junction
- b. Collector-Base breakdown voltage with emitter open (BV_{CBO}) *
- c. Collector-Emitter breakdown voltage with base open (BV_{CEO})
- d. Zener breakdown voltage of the Emitter Base junction

180. The electron and hole concentrations in a intrinsic semiconductor are n_i and p_i respectively. When doped with a p-type material, these change to n and p , respectively, then

- a. $n + p = n_i + p_i$
- b. $n + n_i = p + p_i$ *
- c. $np_i = n_i p$
- d. $np \neq n_i p_i$

181. The f_T of a BJT is related to its g_m, C_p, C_m as

a. $f_T = (C_\pi + C_\mu)g_m$ b. $f_T = \frac{e\pi(C_\pi + C_\mu)}{g_m}$

c. $f_T = \frac{g_m}{(C_\pi + C_\mu)}$ d. $f_T = \frac{g_m}{2\pi(C_\pi + C_\mu)}$ *

182. The static characteristics of an adequately forward biased p-n junction is a straight line, if the plot is of

- a. $\log I$ vs $\log V$
- b. $\log I$ vs V *
- c. I vs $\log V$
- d. I vs V

183. A long specimen of p-type semiconductor material

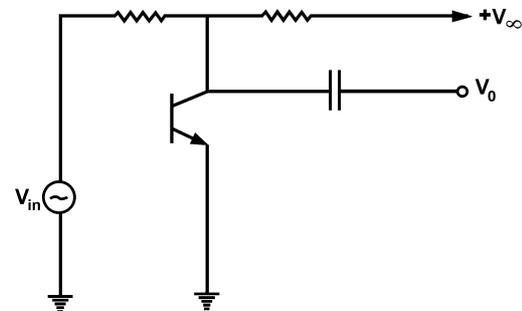
- a. is positively charged
- b. is electrically neutral *
- c. has an electric field directed along its length
- d. acts as a dipole

184. Two identical FETs, each characterized by the parameters g_m and r_d are connected in parallel. The composite FET is then characterized by the parameters

- a. $\frac{g_m}{2}$ and $2r_d$
- b. $\frac{g_m}{2}$ and $\frac{r_d}{2}$
- c. $2g_m$ and $\frac{r_d}{2}$ *
- d. $2g_m$ and $2r_d$

185. The circuit of the figure is an example of

- a. Current series feedback
- b. Current shunt feedback
- c. Voltage series feedback
- d. Voltage shunt feedback *



186. In a differential amplifier, CMRR can be improved by using an increased

- a. emitter resistance *
- b. collector resistance
- c. power supply voltages
- d. source resistance

187. From a measurement of the rise time of the output pulse of an amplifier whose input is a small amplitude square wave, one can estimate which of the following parameter of the amplifier ?

- a. gain-bandwidth product
- b. slew rate
- c. upper 3-dB frequency *
- d. lower 3-dB frequency

188. Thermal runaway in a transistor biased in the active region is due to

- a. heating of the transistor
- b. changes in β which increases with temperature
- c. base emitter voltage V_{BE} which decreases with rise in temperature
- d. change in reverse collector saturation current due to rise in temperature *

189. Match List I with List II and select the correct answer using the codes given below the lists :

List - I (Name of the Circuit)	List - II (Characteristics of the Circuit)
A. Darlington amplifier	1. A circuit using pnp and npn transistor; in power amplifier
B. Common Base amplifier	2. A common source driving a common - gate amplifier
C. Complementary symmetry amplifier	3. A circuit with over-all voltage gain close to 1 and very large input impedance
D. Cascade amplifier	4. A circuit with low input impedance; mainly used in high frequency application.

Codes :

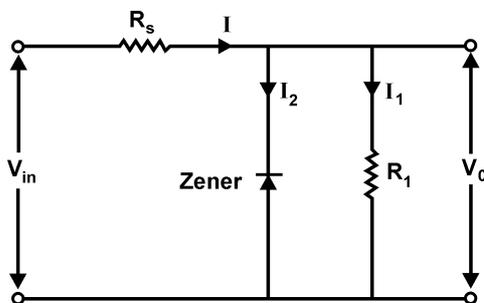
	A	B	C	D
(a)	1	2	2	2
(b)	2	1	2	1
(c)	3	4	1	2 *
(d)	4	3	2	1

190. Consider the following statements regarding the circuit given in the figure, where the output voltage is constant:

- 1. $V_{in} >$ the voltage at which the zener breaks down
- 2. $I_L <$ the difference between I and I_2 , the current at which the zener breaks down
- 3. $R_s <$ the zener nominal resistance

Of these statements

- a. 1, 2 and 3 are correct
- b. 1 and 2 are correct *
- c. 2 and 3 are correct
- d. 1 and 3 are correct



191. The ideal characteristic of a stabilizer is
- a. constant output voltage with low internal resistance *
 - b. constant output with low internal resistance
 - c. constant output voltage with high internal resistance

- d. constant internal resistance with variable output voltage

192. Silicon diode is less suited for low voltage rectifier operation, because
- a. it can withstand high temperature
 - b. its reverse saturation current is low
 - c. its cut-in voltage is high
 - d. its break down voltage is high *

193. Consider the following statements regarding SCR
1. If the SCR, even with proper gate excitation and anode cathode voltage does not conduct for a particular load resistance to turn ON the SCR.
 2. The SCR would be turned OFF by voltage reversal of the applied anode-cathode ac supply of frequencies upto 30 kHz.
 3. If the gate current of the SCR is increased, then the forward breakdown voltage will increase.

Of these statements

- a. 1, 2 and 3 are correct
- b. 2 and 3 are correct
- c. 1 and 3 are correct *
- d. 1 and 2 are correct

194. As compared to a full-wave rectifier using two diodes, the four diode bridge rectifier has the dominant advantage of

- a. higher current carrying capacity
- b. lower peak inverse voltage requirement *
- c. lower ripple factor
- d. high efficiency

195. If in intrinsic germanium at 300 K (27° C) the charge concentration and mobilities of free electrons and holes are 2.5×10^{13} per cc, 3.8×10^3 cm²/V-sec and 1.8×10^3 cm²/V-sec respectively, then its resistivity at 300 K is

- a. 230×10^3 cm
- b. 100 cm
- c. 44.6 cm *
- d. 22.3 cm

196. Consider the following four common type of transistors

1. Point Contact Transistor
2. Bipolar Junction Transistor
3. MOS Field Effect Transistor
4. Junction Field Effect Transistor

The correct arrangement of these transistors in the increasing order of input impedance is

- a. 1, 2, 4, 3
- b. 1, 2, 3, 4
- c. 2, 1, 3, 4
- d. 2, 1, 4, 3 *

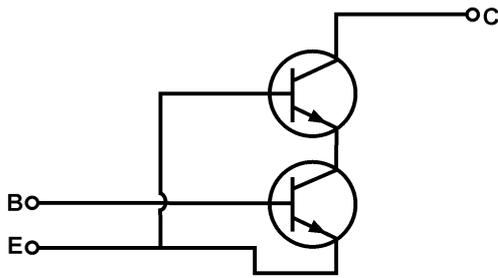
197. The bandwidth of an RF tuned amplifier is dependent on

- a. Q-factor of the tuned output circuit *
- b. Q-factor of the tuned input circuit
- c. Quiescent operating point
- d. Q-factors of the output and input circuits as well as the quiescent operating point.

198. If $\alpha = 0.995$, $I_E = 10$ mA and $I_{CO} = 0.5$ mA, then I_{CEO} will be

- a. 25 mA
- b. 100 mA *
- c. 10.1 mA
- d. 10.5 mA

199. The approximate value of input impedance of a common emitter amplifier with emitter resistance R_o is given by
- $h_{ie} + A_1 R_c$
 - $h_{ie} + (1 + h_{fe}) R_c$ *
 - h_{ie}
 - $(1 + h_{fe}) R_c$
200. The circuit diagram shown in the figure consists of transistors in
- Parallel connection *
 - Cascade connection
 - Darlington connection



201. If an amplifier with gain of -1000 and feedback of $b = -0.1$ had a gain change of 20% due to temperature, the change in gain of the feedback amplifier would be
- 10%
 - 5%
 - 0.2 % *
 - 0.01 %
202. Match List I (circuit) with List II (characteristic) and select the correct answer using the codes given below the lists :

List - I	List - II
A. RC-coupled	1. Very low Drift amplifier
B. Tuned amplifier	2. Flat frequency response from zero frequency onwards
C. Chopper stabilized	3. Flat frequency response with an upper and a lower cut-off frequency
D. Direct coupled amplifier	4. Peak in gain frequency response.

Codes :

	A	B	C	D
(a)	4	3	1	2
(b)	3	4	2	1
(c)	3	4	1	2 *
(d)	4	3	2	1

203. The transfer function of an amplifier is given by

$$A_v = \frac{V_o}{V_s} = \frac{2810}{[1 + j(f/5.85 \times 10^5)][1 + j(f/5.85 \times 10^6)]}$$

The high 3-dB frequency of the amplifier will be approximately

- 5850 kHz *
 - 585 kHz
 - 5850 Hz
 - 585 Hz
204. In the case of an amplifier, the normalized voltage gain is given by

$$\frac{A_v}{A_o} = \frac{1}{1 + (R'/R)} \cdot \frac{1 + j(f/f_0)}{1 + j(f/f_p)}$$

where f_0 is the zero frequency and f_p is the pole frequency

For a standard frequency response of the amplifier.

- $f_p \gg f_0$ *
 - $f_p = f_0$
 - $f_p \ll f_0$
 - none of these
205. Match List-I (Transistor parameter) with List-II (Typical value) and select the correct answer using the codes given below the Lists:

List - I	List - II
A. r_{bb}	1. 80 k ohms
B. r_{be}	2. 1 k ohm
C. r_{ce}	3. 100 ohms
D. $r_{b'c}$	4. 100 pF
	5. 3 pF

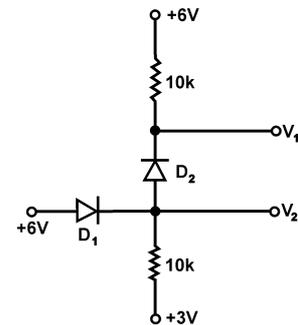
Codes :

	A	B	C	D
(a)	3	2	1	4
(b)	3	2	1	5 *
(c)	1	3	2	4
(d)	1	3	2	5

206. The dissipation at the collector is zero in the quiescent state and increases with excitation in the case of a
- Class A series-fed amplifier
 - Class A transistor coupled amplifier
 - Class AB amplifier
 - Class B amplifier *
207. Avalanche photodiodes are preferred over PIN diodes in optical communication systems because of
- speed of operation
 - higher sensitivity
 - larger bandwidth
 - large power handling capacity *

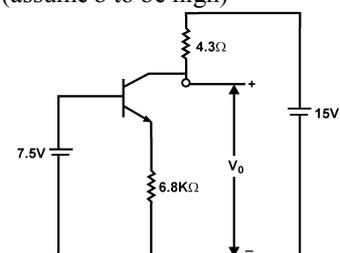
208. The voltages at V_1 and V_2 of the arrangement shown in the figure will be respectively

- 6 V and 5.4 V
- 5.4 V and 6 V
- 3 V and 5.4 V
- 6 V and 3 V *



209. The best approximation for V_c in the circuit shown in the figure will be (assume β to be high)

- 4V
- 6.8V
- 8.7V
- 10.7V *



210. In the differential and common mode gains of a differential amplifier are 50 and 0.2 respectively, then the CMRR will be
 a. 100 b. 49.8
 c. 8.7V d. 10.7V *

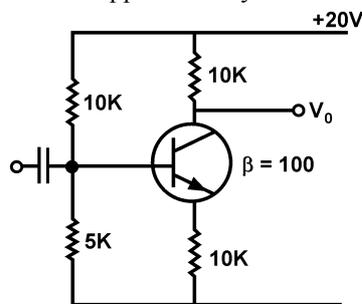
211. In the commutation angle of a diode rectifier (due to source inductance effect) is μ , then the inductive voltage regulation will be
 a. $\frac{1 + \cos \mu}{2}$ b. $1 + \frac{\cos \mu}{2}$
 c. $1 - \frac{\cos \mu}{2}$ d. $\frac{1 - \cos \mu}{2}$ *

212. Consider the following statements :
 The diodes in a voltage source inverter (McMurray inverter) should be able to
 1. withstand a large voltage in the reverse direction.
 2. carry the commutating current excess of load current.
 3. provide the required reverse bias to the outgoing thyristor.
 4. feedback the reactive current to the source.
 Of these statements
 a. 1, 2 and 3 are correct b. 1, 3 and 4 are correct *
 c. 2, 3 and 4 are correct d. 1, 2 and 4 are correct

213. If an intrinsic semiconductor is doped with a very small amount of boron, then in the extrinsic semiconductor so formed, the number of electrons and holes will
 a. decrease
 b. increase and decrease respectively
 c. increase
 d. decrease and increase respectively *

214. If $\alpha = 0.98$, $I_{CO} = 6 \text{ mA}$ and $I_R = 100 \text{ mA}$ for a transistor, then the value of I_C will be
 a. 2.3 mA b. 3.1 mA
 c. 4.6 mA d. 5.2 mA *

215. The given figure shows a silicon transistor connected as a common emitter amplifier. The quiescent collector voltage of the circuit is approximately
 a. 20/3 V
 b. 10V
 c. 14 V *
 d. 20V



216. A junction transistor operating at room temperature with $I_C = 2 \text{ mA}$, where $kT/q = 25 \text{ mV}$ has $\beta = 100$. The values of the parameters g_m in mhos and r_x in ohms will be respectively
 a. 0.04 and 2500 b. 0.08 and 1250
 c. 0.5 and 800 d. 0.08 and 5000 *

217. Consider the following statements regarding an RC phase-shift oscillator
 1. The amplifier gain is positive
 2. The amplifier gain is negative
 3. The phase shift introduced by the feedback network is 180° .
 4. The phase shift introduced by the feedback network is 360° .

Of these statements

- a. 1 and 3 are correct b. 2 and 3 are correct *
 c. 2 and 4 are correct d. 1 and 4 are correct

218. If an input signal with non-zero dc component is applied to a low pass RC network, the dc component in the output will be
 a. the same as that in the input *
 b. less than that in the input
 c. more than that in the input
 d. zero

219. **Assertion A** : UJT is used in relaxation oscillator.
Reason R : UJT has negative resistance region in its characteristics.
 Make the answer as
 a. If A is correct and R is the correct explanation of A
 b. If A is correct and R is not the correct explanation of A *
 c. If A is true and R is false
 d. If A is false and R is true

220. If R_0 is the source resistance, the output resistance of an emitter-follower using the simplified hybrid model would be

- a. $\frac{h_{ie} + R_s}{1 + h_{fe}}$ * b. $\frac{h_{ie} + R_s}{h_{fe}}$
 c. $R_s + \frac{1}{h_{fe}}$ d. $\frac{1}{h_{fe}}$

221. For a transistor amplifier with self-biasing network, the following components are used
 $R_1 = 4 \text{ kW}$
 $R_2 = 4 \text{ W}$ and
 $R_e = 1 \text{ kW}$
 The approximate value of the stability factor 'S' will be
 a. 4 b. 3 *
 c. 2 d. 1.5

222. In a transistor amplifier, the reverse saturation current I_{CO}
 a. doubles for every 10° C rise in temperature *
 b. doubles for every 1° C rise in temperature
 c. increases linearly with temperature
 d. doubles for every 5° C rise in temperature

223. The ripple factor of a power supply is given by (symbols have the usual meaning)

- a. $\frac{P_{dc}}{P_{ac}}$ * b. $\sqrt{(I_{rms} / I_{dc}) - 1}$

- c. $\sqrt{(I_{dc}/I_{rms})-1}$ d. I_{dc}/I_{rms}
224. The transition region in an open circuited p-n junction contains
 a. free electron only
 b. holes only
 c. both free electrons and holes
 d. uncovered immobile impurity ions *
225. In a p-n diode, hole diffuse from p-n region to n-region because
 a. there is higher concentration of holes in the p-region *
 b. holes are positively charged
 c. holes are urged to move by the barrier potential
 d. the free-electron in the n-region attract the holes
226. In an unbiased p-n junction, the junction current at equilibrium is
 a. due to diffusion of majority carriers
 b. due to diffusion of minority carriers
 c. zero due to equal and opposite currents crossing the junction *
 d. zero because no charges cross the junction
227. In an unbiased pn junction, zero current implies that
 a. the potential barrier has disappeared
 b. number of holes diffusing from p-side to n-side equals the number of electrons diffusing from n-side to p-side
 c. no carrier cross the junction
 d. total current crossing junction from p-side to n-side equals the total current crossing the junction from n-side to p-side *
228. The potential energy barrier in joules developed across an open circuited pn equals
 a. V_0 b. $q V_0$ *
 c. $\frac{V_0}{q}$ d. $-V_0$
 Where V_0 is the contact potential in the volts.
229. In the energy band diagram of an open circuited pn junction, the energy band of n region has shifted relative to that of p-region
 a. downward by E_0 * b. upward by E_0
 c. downward by $E_0/2$ d. upward by $E_0/2$
 where V_0 is the contact potential in the volts.
230. In a pn diode, with the increase of reverse bias, the reverse current
 a. increases
 b. decreases
 c. remains constant *
 d. may increase or decrease depending on the doping
231. A reverse based pn junction has
 a. net hole current
 b. net electron current
- c. extremely small constant reverse current *
 d. very large current
232. The law of junction gives that in pn diode, the concentration of holes
 a. $n_{po}\epsilon^{V/VT}$ b. $n_{po}\epsilon^{-V/VT}$
 c. $P_{no}\epsilon^{V/VT}$ * d. $P_{no}\epsilon^{-V/VT}$
 where V is the voltage at p terminal relative to a terminal, n_{po} and p_{no} are the thermal equilibrium concentration of electrons and holes in p and n regions respectively
233. In a Ge diode, reverse saturation current I_0 is of the order of
 a. 1 pA b. 1 nA
 c. 1 mA * d. 1 mA
234. In a silicon diode, the reverse saturation current is of the order of
 a. 1 pA b. 1 nA *
 c. 1 mA d. 1 mA
235. The reverse saturation current I_0 in germanium diodes varies as
 a. T b. $T^{1.5}$ *
 c. T^2 d. $\frac{1}{T}$
 where T is the temperature in deg K.
236. In silicon diode, reverse saturation current I_0 varies as
 a. T b. $T^{1.5}$ *
 c. T^2 d. $\frac{1}{T}$
237. In Ge diode, the cutin voltage is about
 a. 0.2 volt * b. 0.6 volt
 c. 1.1 volts d. 2 volts
238. In Si diode, the cutin voltage is about
 a. 0.2 volts b. 0.6 volts *
 c. 1.1 volts d. 1.75 volts
239. In a pn diode, for constant value of current at room temperature dV/dT varies approximately at the rate of
 a. -2.5 mV/deg C * b. -25 mV/deg C
 c. $+2.5$ mV/deg C d. $+25$ mV/deg C
240. The dynamic resistance of diode varies as
 a. $\frac{1}{I^2}$ b. $\frac{1}{I}$ *
 c. I d. I^2
241. Ge diode at room temperature for forward current of 26 mA has dynamic resistance of about
 a. 0.1W b. 1W *
 c. 10W d. 1000W
242. In a step graded reverse biased junction, the width W

of the depletion layer varies as

- a. $\sqrt{V_j}$ * b. V_j
 c. V_j^2 d. $\frac{1}{V_j}$

where V_j is the magnitude of the junction potential

243. In a linearly graded reverse based junction, the width W of the depletion layer varies as

- a. $\sqrt{V_j}$ * b. V_j
 c. $V_j^{1/3}$ d. $\frac{1}{V_j}$

where V_j is the magnitude of the junction potential.

244. In any pn junction, the transition capacitance C_T varies as

- a. W b. W^2
 c. $\frac{1}{W}$ * d. \sqrt{W}

where W is the width of the depletion layer.

245. In a forward biased pn diode, the injected hole current in the n-region is proportional to

- a. $\frac{1}{Q}$ b. Q *
 c. Q^2 d. Q^3

where Q is the total stored charge.

246. In a forward biased pn diode, assuming $N_A \gg N_D$, the diffusion current I equals

- a. $Q\tau_p$ b. Q/τ_p *
 c. Q/τ_p^2 d. $Q\tau_p^2$

where Q is the injected excess minority carrier charge and τ_p is the life time of holes.

247. In a reverse biased pn diode, the concentration of minority carrier holes in the n-region at the junction boundary equals

- a. zero * b. p_{no}
 c. p_{no}^2 d. $\sqrt{p_{no}}$

248. In a forward based pn diode with $N_A \gg N_D$, the product of the diffusion constant C_D and the dynamic diode resistance r equals

- a. $1/\tau_p$ b. τ_p *
 c. $-\tau_p$ d. $-\tau_p^2$

where τ_p is the life time of injected minority carrier holes.

249. In forward biased pn diode, the diffusion capacitance C_D is proportional to

- a. I * b. I^2
 c. \sqrt{I} d. $1/I$

250. The reverse bias on pn junction

- a. pushes the electron and holes away from the junction *
 b. has no effect on the holes and electrons
 c. attracts holes and electrons towards the junction
 d. increases the reverse current

251. In a forward biased pn diode

- a. forward current is zero
 b. only holes cross the junction from p side to n side
 c. only electrons cross the junction from n-side to p-side
 d. both holes on the p-side and electron on the n-side cross the junction to the opposite sides *

252. In a pnp transistor operating in the active region, the concentration of minority carrier holes in the n-region at collector junction J_c is

- a. zero *
 b. thermal equilibrium value P_{no} of emitter
 c. thermal equilibrium concentration of hole in collector region
 d. same as at J_E

253. As the magnitude of the collector junction reverse bias increases, the effective base width

- a. increases
 b. decreases *
 c. remains unaltered
 d. first increase and later becomes constant

254. In an npn diffused junction transistor, the p-type base region formed on the n-type collector region through process of

- a. alloying
 b. epitaxial
 c. change in the nature of doping during crystal growth
 d. diffusion of p-type impurity *

255. In a pnp transistor operating in the active region, in the base region, the main stream of current is

- a. drift of holes b. diffusion of holes *
 c. drift of electrons d. diffusion of electrons

256. In a Ge BJT, for usual value of the collector current, the transistor α is of the order of

- a. 0.99 * b. 0.9
 c. 0.5 d. 50

257. In a pnp Ge transistor, the cutin voltage is about

- a. -0.01 volt b. -0.1 volt *
 c. -0.5 volt d. -5 volt

258. In a pnp Si transistor, the cutin voltage is about

- a. -0.1 volt b. -0.1 volt
c. -0.5 volt * d. -5 volt
259. Transistor α approaches unity when
- a. $\frac{\sigma_B}{\sigma_E} = 1$ b. $\frac{\sigma_B}{\sigma_E} \gg 1$
c. $\frac{\sigma_B}{\sigma_E} \ll 1$ * d. $\frac{\sigma_B}{\sigma_E} = 5$
260. In a BJT, as the conductivity of the base region increases, the punch through voltage
- a. remains unaltered
b. increases *
c. decreases
d. may increase or decrease depending on bias at J_E
261. The dynamic emitter resistance of a BJT operating in the active region is of the order of
- a. 0.01 W b. 1 W *
c. 100 W d. 10 kW
262. In a transistor, β may be expressed in terms of α as below
- a. $\frac{\alpha}{1 + \alpha}$ b. $\frac{\alpha}{1 - \alpha}$ *
c. $\frac{1 + \alpha}{\alpha}$ d. $\frac{1 - \alpha}{\alpha}$
263. In active region operation of a transistor
- a. both junctions are reverse biased
b. both junctions are forward biased
c. Emitter junction is forward biased while collector junction is reverse biased *
d. Emitter junction is reverse biased while collector junction is forward biased
264. In a cutoff region operation of a transistor
- a. both J_E and J_C are forward biased
b. both J_E and J_C are reverse biased *
c. J_E is forward biased while J_C is reverse biased
d. J_E is reverse biased while J_C is forward biased where J_E and J_C are respectively the emitter and collector junctions.
265. In saturation region operation of a transistor
- a. both J_E and J_C are forward biased *
b. both J_E and J_C are reverse biased
c. J_E is forward biased while J_C is forward biased
266. For active region operation of a pnn transistor
- a. Emitter is positive with respect to base *
b. Emitter is negative with respect to base
c. Emitter is at the same voltage as base
d. Base is at the same voltage as collector
267. For active region operation of npn transistor
- a. Emitter is positive with respect to base
- b. Emitter is negative with respect to base *
c. Emitter is at the same voltage as base
d. Base is at the same voltage as collector
268. In a BJT with $I_{\infty} = 1\mu A$, $\alpha = 0.99$, the value of I_{CEO} is
- a. 0.01 mA b. 0.1 mA
c. 1 mA d. 100 mA *
269. In a BJT, with $\alpha = 0.98$, β equals
- a. 49 * b. 98
c. 0.49 d. 980
270. In a BJT, with $\beta = 100$, α equals
- a. 99 b. 0.99 *
c. 100 d. 1.01
271. In a BJT, with $\beta = 100$, the base current approximately equals
- a. 0.03 mA b. 3000 mA
c. 0.3 mA * d. 30 mA
272. In a BJT, the base spreading resistance is of the order of
- a. 10 W b. 100 W *
c. 1 W d. 1 kW
273. The value of voltage V_{BE}^{cutoff} in a pnp silicon transistor approximately equals
- a. 0 * b. 0.1 volt
c. 0.2 volt d. 0.5 volt
274. The value of V_{BE}^{cutoff} in a pnp Fe transistor approximately equals
- a. 0 b. .1 volt *
c. 0.2 volt d. 0.5 volt
275. The value of V_{BE}^{active} in pnp Si transistor typically equals
- a. 0 b. 0.1 volt
c. -0.7 volt * d. +0.7 volt
276. The value of V_{BE}^{active} in pnp Ge transistor typically equals
- a. 0 b. -0.1 volt
c. -0.2 volt * d. +0.2 volt
277. The value of V_{BE}^{sat} in pnp Si transistor typically equals
- a. -0.1 volt b. -0.3 volt
c. -0.8 volt * d. +0.8 volt
278. The value of V_{BE}^{sat} in pnp Ge transistor typically equals
- a. -0.1 volt b. -0.3 volt *
c. -0.8 volt d. +0.8 volt
279. The value of V_{CE}^{sat} in pnp Si transistor typically equals
- a. -0.1 volt b. -0.2 volt *
c. +0.2 volt d. -0.5 volt

280. The value of V_{CE} sat in pnp Ge transistor typically equals
 a. -0.1 volt * b. +0.1 volt
 c. -0.2 volt d. +0.2 volt
281. MOS transistor
 a. has only one pn junction
 b. conducts when sufficient voltage is applied to the gate electrode *
 c. has only two electrons
 d. has gate electrode in direct contact with the silicon
282. In inverted operation of a transistor
 a. both junctions are reverse biased
 b. both junctions are forward biased
 c. emitter junction is reverse biased while collector junction is forward biased *
 d. emitter junction is forward biased while collector junction is reverse biased.
283. Most of the small signal transistors are
 a. npn silicon transistor in plastic package *
 b. pnp silicon transistor in plastic package
 c. npn germanium transistor in metallic case
 d. pnp germanium transistor in metallic case
284. Transistor is usually encapsuled in
 a. graphite power b. enamel paint
 c. epoxy resin * d. all of these
285. Encapsulation of transistor is done to
 a. provide mechanical ruggedness *
 b. prevent photo-electric effects
 c. prevent electrical interference
 d. to case heat radiation
286. Power transistors are invariably provided with
 a. heat silk * b. metallic casing
 c. soldered connections d. fan for heat removal
287. Heat sink removes heat from a power transistor mainly by
 a. radiation b. conduction
 c. nature convection * d. forced convection
288. With both junctions reverse biased the transistor operates in
 a. active region b. cutoff region *
 c. saturation region d. inverted region
289. In an npn transistor operating in the active region the main current crossing the collector junction from side is
 a. hole drift current
 b. hole diffusion current
 c. electron diffusion current *
 d. electrons drift current
290. A transistor with emitter junction forward biased and collector junction reverse biased is said to operate in
 a. active region * b. saturation region c. cutoff region d. inverted region
291. In a transistor, current I_{CBO}
 a. increase with increase of temperature *
 b. decrease with increase of temperature
 c. is normally greater for Si transistor than Ge transistor
 d. mainly depends on the emitter base junction \bias
292. In a transistor current I_{CBO} flow in
 a. base and emitter leads
 b. collector and emitter leads
 c. base and collector leads *
 d. emitter, base and collector leads
293. In an npn transistor, the function of emitter is
 a. to inject holes into base
 b. to inject electrons into the base *
 c. to inject electrons into the collector
 d. to inject holes into the collector
294. Epitaxial growth in IC chip
 a. may be of n-type only
 b. may be of p-type only
 c. involves growth from gas phase *
 d. involves growth from liquid phase
295. Epitaxial growth in IC chip
 a. involves chemical reaction *
 b. involves growth from liquid phase
 c. has inferior uniformity of resistivity than the diffusion growth
 d. may be of p-type only
296. The chemical reaction involved in epitaxial growth in IC chips takes place at a temperature of about
 a. 500°C b. 1200°C *
 c. 2000°C d. 3000°C
297. Use of buried layer in npn monolithic transistor causes the series resistor to
 a. increase
 b. decrease *
 c. remain unaltered
 d. become temperature sensitive
298. In comparison with conventional npn IC transistor, the current gain of lateral pnp IC transistor is
 a. excessively higher b. higher
 c. lower * d. of the same order
299. Super gain npn transistor has current gain of the order of
 a. 50 b. 500
 c. 5000 * d. 50,000
300. A single monolithic IC chips occupies area of about
 a. 20 mil^2 b. 200 mil^2
 c. 2000 mil^2 * d. $20,000\text{ mil}^2$
301. Monolithic IC chip has thickness of about

- a. 1 mil b. 5 mils *
c. 50 mils d. 200 mils
302. An IC comprises of 40 logic gates, each of which consists of 5 components. This forms a case of
a. SSI b. MSI *
c. LSI d. VLSI
303. An single IC chip contains more than 120 logic gates. This forms a case of
a. SSI b. MSI
c. LSI * d. VLSI
304. Silicon dioxide layer is used in IC chips for
a. providing mechanical strength to the chip
b. diffusing elements
c. providing contacts
d. providing mask against diffusion *
305. Substrate in a monolithic IC has thickness of the order of
a. 1 mil b. 5 mils *
c. 50 mils d. 100 mils
306. Isolation diffusion in a monolithic IC creates concentration of acceptor atoms in the region between the isolation of the order of
a. $10^{15}/\text{cm}^3$ b. $10^{20}/\text{cm}^3$ *
c. $10^{25}/\text{cm}^3$ d. $10^{30}/\text{cm}^3$
307. The photoetching process consists in
a. removal of photoresist
b. cerbing lines on the wafer before dicing
c. diffusing impurities
d. removal of SiO_2 layer from selected portions *
308. Reliability of IC's may be increased by
a. reducing component size
b. additional testing
c. reducing the number of interconnections *
d. operation at higher voltage
309. Solid solubility of phosphorus in silicon
a. remains constant at all temperature
b. continuously increases with increases of temperature
c. continuously decreases with increase of temperature
d. first increase with temperature, reaches a maximum and then decreases with further increase in temperature *
310. Diffusion constant D of phosphorus impurity in silicon
a. remains temperature invariant
b. continuously increases with increases of temperature *
c. continuously decreases with increase of temperature
d. first increase with temperature, reaches a maximum and then decreases with further increase in temperature
311. Microwave IC's
a. can be made using thin film on ceramics
b. can be made using thick film on ceramics *
c. are very difficult to fabricate
d. are not fabricated so far
312. A diffused resistor in an IC
a. is formed along with fabrication of transistors *
b. can be fabricated with prevision for any resistance value
c. is fabricated before transistor diffusion
d. is fabricated after transistor diffusion
313. In IC's npn construction is preferred to pnp construction because
a. npn construction is cheaper
b. npn construction permits higher packing of elements
c. p-type base is preferred
d. n-type base is preferred to reduce diffusion constant *
314. A multichip circuit
a. consists of number of interconnected thin film circuits
b. consists of a number of interconnected thick film circuits
c. consists of a number of interconnected thin film and thick film circuits
d. consists of several interconnected monolithic wafers *
315. Photomasking process in IC fabrication
a. is used to remove selected regions of SiO_2 *
b. controls the depth of diffusion
c. forms an insulation layer which prevents diffusion in selected areas
d. consists in removal of photoresist
316. Main advantage of IC technology is possibility of
a. securing high stability at low cost *
b. using high values of capacitors
c. fabricating low tolerance resistors
d. repairing individual circuit elements
317. Capacitors of integrated circuits
a. can not be integrated and have to be placed externally
b. can be fabricated using SiO_2 as dielectric *
c. can not be fabricated using diffusion techniques
d. area always of very high values
318. Overall cost of an IC
a. is always dominated by the design cost
b. is always higher than the corresponding discrete component assembly
c. is continuously increasing
d. is in general lower than corresponding discrete components assembly *
319. Microwave IC's

- a. have inferior performance
b. are not possible to fabricate
c. always use discrete components
d. are initially being made as hybrid type on ceramic substrates *
320. Small size and weight of IC's
a. is a disadvantage in circuit operation
b. increases the fabrication cost
c. reduces the reliability
d. make them specially useful in missiles *
321. Monolithic IC design is based on
a. extensive use of transistors and diodes *
b. extensive use of RC coupling
c. using high value resistors and capacitors
d. making the area of circuit elements as large as possible
322. Cost of monolithic IC is
a. independent of the quantity produced
b. roughly proportional to the area of circuit wafer *
c. proportional to the number of circuit elements
d. increases with increase of quantity produced
323. Digital IC's are mainly designed for use
a. as voltage comparators
b. as analog industrial control equipment
c. as radio receivers
d. as logic system in digital computers *
324. Application of IC's in industrial control
a. is not economical for consumer applications
b. is not yet made
c. promises high reliability at a higher cost
d. is being successfully used *
325. Use of IC's in measuring instruments
a. does not involve linear types
b. is not suitable
c. requires development of special circuits
d. utilizes their low power consumption and low operating cost *
326. In IC's the main elements contributing to reduced reliability is
a. diffused resistors
b. diffused transistors
c. wiring interconnections *
d. diffused capacitors
327. The most important reason for use of IC arrays is
a. high reliability *
b. reduced power consumption
c. simplified circuit design
d. simplified processing
328. IC's are economical for use in logic systems because
a. of the quantity of repeat circuits used *
b. binary circuits are possible only with IC's
c. the diffusion process is simpler
- d. private circuit boards are inexpensive
329. In processing IC slices
a. SiO_2 is removed in final processing
b. isolation structure is completed first *
c. slices are never oxidized
d. separate diffusions are used for each component.
330. In monolithic IC, isolation may be easily obtained by
a. using a layer of photoresist
b. scribing
c. using reverse biased pn junction *
d. using SiO_2 layer
331. In IC's diodes
a. need a separate diffusion process
b. are formed simultaneously with other elements *
c. are double ended
d. are formed on the top of the SiO_2 surface of the wafer
332. An important merit of monolithic IC's for linear application is that
a. a wider frequency range is possible
b. all components are at the same temperature *
c. bias stabilization can be achieved with close tolerance resistors
d. high value capacitors can be economically fabricated
333. Solid state diffusion
a. is an important process in fabrication of IC's *
b. can be carried out at a low temperature
c. can not be used to form pn junction
d. result in impurities moving rapidly into silicon wafer
334. The most important factor governing the cost of IC components is
a. the shape of the component
b. area occupied by the component *
c. number of electrode connections
d. location of the component on the slice
335. In silicon monolithic IC, isolation
a. is not necessary because silicon substrate is an insulator
b. is needed because silicon is electrically conducting*
c. can be obtained by scribing
d. can be obtained by use of SiO_2 layer
336. In IC technology, main merit of MOS transistor structure is
a. lower resistance
b. lower parasitic capacitance
c. faster switching
d. higher component density and lower cost *
337. IC's are probe tested
a. to measure individual components
b. after separation into individual wafers

- c. on the complete slice for dc operation *
- d. to check small signal a.c characteristics
338. The photo-resist process is used
- during high temperature diffusion
 - to prevent photo response
 - to control the etching of SiO_2 from selected regions on a silicon slice *
 - to photograph the silicon slice
339. Monolithic IC's
- are made of Ge
 - are made using the diffused planar process *
 - are made of ceramic substrate
 - use interconnection pattern formed under the final oxide
340. Extremely low power dissipation and low cost per gate can be achieved in which of the following IC ?
- ECL
 - CMOS *
 - TTL
 - MOS
341. Which of the following digital IC family can give maximum fan out ?
- ECL
 - PMOS
 - CMOS *
 - HTL
342. Thick film components are formed
- by fabricating active and passive components simultaneously
 - by diffusion process
 - on a thick semiconductor substrate
 - with conducting ink and a glass metal slurry silk screened on a ceramic substrate *
343. Thin film passive elements
- are made of ceramic
 - are made of silk screening process
 - are formed by photomasking and diffusion
 - can be made entirely from tantalum *
344. Thin film technology
- is used for fabricating active components
 - uses silk screening
 - uses vapour deposition of material on a substrate*
 - produces components cheaper than by thick film technology
345. In monolithic IC's resistors are formed
- from manganin wire
 - from ceramic material
 - by using solid diffusion of impurity *
 - from aluminium
346. The term medium scale integration refers to IC's
- having a single level of metallization
 - technology with complexity in the range of 10 to 100 gates *
 - with complexity below 10 gates
 - manufactured on medium volume production line
347. The two level system of inter-connection
- requires increased chip area
 - must not allow interconnections on the two levels to cross each other
 - may be used to advantage on custom MSI units using master slices *
 - can never be used for IC components using LSI
348. In IC electronic system
- cost of printed circuit is negligible
 - it is most economical to use types with the optimum complexity so as to get the low cost per gate *
 - the total system is same irrespective of type used
 - it is desirable to use simple gate types mounted as printed circuit board
349. As the complexity of a packaged IC is increased
- cost per gate goes on decreasing
 - package cost per gate remains the same
 - overall cost per gate reduces, reaches a minimum at some level of complexity and then increases *
 - overall cost always increases with the increase of complexity
350. Large Scale Integration
- does not require costly process facilities
 - can not be applied to MOS systems
 - refers only to integrated electronics components fabricated on full slices of silicon
 - refers to technology used to fabricate IC's with complexity above 100 gates *
351. Large memory arrays
- can not be formed using MOS technology
 - are not suitable for fabrication by full LSI technique
 - can be formed using full slice LSI technique including redundancy and two level interconnection *
 - use a large number of circuit bits connected in series
352. Very Large Scale Integration (VLSI)
- refers to a small computer on a chip *
 - can not be applied to MOS types
 - refers to IC's with complexity below 100 gates
 - does not require costly process facilities
353. An integrated electronic components is
- once circuit element of an IC
 - a complete electronic function consisting of several IC's formed and interconnected on a single chip of silicon with circuit complexity above 10 gates *
 - a discrete device assembly
 - an electronic component included in an electronic circuit assembled on a PCB
354. The dual-in-line package is usually assembled into printed circuit cards by
- using parallel gap soldering
 - using welding
 - using flow soldering technique *
 - soldering each lead individually

355. One advantage of the dual-in-line package is that it
- is the smallest package
 - has very close lead spacing
 - was readily available when IC's were first made
 - is compatible with PCB assembly methods *
356. When a chip with more than two gates is assembled into an IC package, then
- the system reliability is worst
 - the system becomes costlier
 - the total cost remains unaltered
 - the package cost is shared between more gates resulting in a lower cost per gate *
357. In temperature control system, IC's
- need have low gain
 - are used instead of thermocouples
 - compare the output of a thermocouple with a reference and amplify the difference signal *
 - are used as the main power control element.
358. In industrial electronic control
- a.c. power systems are always used
 - IC's can be used with advantage in feed back control circuits *
 - we are simply concerned in establishing stable control with constant load conditions
 - use of IC's is not of consequence
359. Propagation delay t_{pd} of an IC is defined as
- the delay in charging the output capacitance
 - the delay in changing from 0 to 1 and vice versa
 - the delay that the circuit shows between its input and output *
 - the delay the transistor creates in switching from one state to the other
360. Linear MOS IC's
- are not possible
 - can not use MOS load resistor
 - are difficult to fabricate
 - can be designed to use direct connection between stages *
361. IC's made by sputtering materials on a ceramic substrate are called
- thin film IC's *
 - thick film IC's
 - Monolithic IC's
 - Hybrid IC's
362. MOSIC's
- consume more power
 - occupy much less space than bipolar junction transistor *
 - use load resistance
 - are preferred because of high speed
363. MOS IC's are fast gaining popularity because
- their density of packing is more and power consumption is less *
 - they occupy less space and hence are cheaper
 - they use direct coupled transistor logic
 - their propagation delay is less
364. IC video amplifiers
- can not be converted to narrow band amplifier
 - are always relatively narrow band amplifiers
 - amplify only at very high frequencies
 - given uniform amplification from dc upto typically 40 MHz *
365. A typical medium gain IC Op Amp
- is suitable for use at low frequencies only
 - has only one input terminal
 - has an open loop gain of about 100
 - has an open loop gain of about 2500 *
366. An IC sense amplifier
- consists of a linear amplifier, a voltage level detector, and a logic pulse forming circuit *
 - can not practically be made as a standard product
 - is a memory system
 - consists of four separate linear amplifiers
367. The most popularly used logic IC's are
- ECL and CTL
 - RTL and RCTL
 - TTL and DTL *
 - simple gate types
368. A dual 4 input gate IC consists of
- a single gate with eight inputs
 - four gates each with two inputs
 - two separate gates each with four inputs *
 - a simple gate with two groups of four inputs
369. CMOS input level are given by
- $V_{IL} = 0; V_{IH} = 0.7 V_{DD}$
 - $V_{IL} = 0.3 V_{DD}; V_{IH} = 0.7 V_{DD}$ *
 - $V_{IL} = 0; V_{IH} = V_{DD}$
 - $V_{IL} = 0.3 V_{DD}; V_{IH} = V_{DD}$
370. In a combined gate monolithic IC
- a number of gate circuits are interconnected on a single chip to give a complex logic function
 - the total number of gates is generally below ten
 - only TTL logic is used *
 - several separate chips each with one gate are assembled into one package
371. CMOS has the following advantage over PMOS/NMOS
- simpler fabrication process
 - lower P_D *
 - lower input capacitance
 - greater suitability for LSI
372. TTL has the following advantage over CMOS
- lower P_D
 - use of transistors alone as circuit elements
 - greater suitability for LSI
 - simpler fabrication process *
373. In a multiphase IC, isolation is obtained by

- d. mobility of charge carrier electron in n-channel FET is greater than the mobility of charge carrier hole in p-channel FET *
393. The charge carriers in a p-channel FET are
 a. electrons alone
 b. holes alone *
 c. both electrons and holes
 d. may be either electrons or holes
394. The charge carriers in a n-channel FET are
 a. electrons alone *
 b. holes alone
 c. both electrons and holes
 d. may be either electrons or holes
395. When the gate-to-source voltage V_{GS} of an n-channel JET is made more and more negative, the drain current
 a. increases
 b. decreases *
 c. remains unchanged
 d. may increase or decrease
396. When the gate-to-source voltage V_{GS} of an p-channel JFET is made more and more positive, the drain current
 a. increases
 b. decreases *
 c. remains unchanged
 d. may increase or decrease
397. The input resistance of a JFET is of the order of
 a. 1kW
 b. 10kW
 c. 10MW
 d. 100 MW *
398. The main drawback of a JFET is its
 a. high input impedance
 b. low input impedance
 c. higher noise
 d. lower gain *
399. In a JFET, the amplification factor m , transconductance g_m , and the dynamic drain resistance r_d are related is
 a. $\mu = \frac{g_m}{r_d}$
 b. $\mu = \frac{r_m}{g_m}$
 c. $\mu = g_m \cdot r_d$ *
 d. $m = g_m \cdot r_d^2$
400. The transconductance g_m of a JFET is of the order of
 a. 1 mS *
 b. 1S
 c. 100 S
 d. 1000 S
401. Inter electrode capacitances in an FET are of the order of
 a. 1 pF *
 b. 100 pF
 c. 0.1 mF
 d. 1 mF
402. The dynamic drain resistance of a JFET is of the order of
 a. 1kW
 b. 10kW
 c. 500 MW *
 d. 100 MW
403. The dynamic drain resistance of MOSFET is of the order of
 a. 10kW *
 b. 500kW
 c. 5MW
 d. 100MW
404. The magnitude of the threshold voltage V_T for enhancement MOSFET is of the order of
 a. 4 volts *
 b. 10 volts
 c. 40 volts
 d. 100 volts
405. Out of the four devices mentioned below, the fastest switching device is
 a. JFET
 b. BJT
 c. MOSFET *
 d. Triode
406. The JFET can operate in
 a. depletion mode only *
 b. enhancement mode only
 c. either depletion or enhancement mode at a time
 d. both depletion and enhancement modes simultaneously
407. The input gate current of FET is
 a. a few amperes
 b. a few milli-amperes
 c. a few micro-amperes
 d. negligibly small *
408. Which of the following transistor is affected by static electricity?
 a. npn transistor
 b. JFET
 c. UJT
 d. MOSFET *
409. Which of the following device has the highest input impedance?
 a. CE BJT
 b. CE BJT *
 c. JFET
 d. MOSFET
410. A field-effect transistor (FET)
 a. has three pn junctions
 b. uses a forward biased junction
 c. depends on the variation of a magnetic field for its operation
 d. depends on the variation of a reverse voltage its operation *
411. The operation of a JFET involves
 a. flow of minority carriers alone
 b. flow of majority carriers alone *
 c. flow of both minority and majority carriers
 d. use of a magnetic field
412. FET
 a. has a very high input impedance *
 b. depends on minority carrier flow
 c. uses a forward biased junction
 d. uses a high concentration emitter junction
413. A pnpn device having no gate is called
 a. UJT
 b. Triac
 c. Schockley diode *
 d. SCR

414. A pnpn diode is
- a negative resistance device
 - a voltage controllable device
 - a controlled rectifier
 - a current controlled negative resistance device *
415. In a pnpn diode, a breakover condition is marked by
- a sudden decrease in current
 - a sudden increases in current *
 - diode getting burnt off
 - a sudden glow taking place
416. Holding current in a pnpn diode is the
- maximum operating current
 - normal operating current
 - current corresponding to breakover voltage
 - minimum current to keep the device ON *
417. A pnpn diode
- is always made of silicon *
 - is always made of germanium
 - may be made of either silicon or germanium
 - may be made of any semiconductor
418. A pnpn diode
- in unilateral device *
 - is a bilateral device
 - may function either as a unilateral or as a bilateral device
 - functions as a bilateral device depending on the ambient temp.
419. In a pnpn diode, breakover takes place when
- $(\alpha_1 + \alpha_2) = 0.5$
 - $(\alpha_1 + \alpha_2) = 0.9$
 - $(\alpha_1 + \alpha_2) = 1.0$ *
 - $\alpha_1 = \alpha_2$
- where α_1 and α_2 refer to the constituent transistors
420. In a pnpn diode, the phenomenon of rate effect depends on
- rate of change of temperature
 - rate of change of applied voltage *
 - avalanche breakdown
 - negative resistance in the forward voltage condition
421. A bilateral pnpn diode switch
- consists of two pnpn diodes in parallel but in opposite order *
 - is a 3 layer semiconductor device
 - is a unilateral device
 - is a bilateral device
422. SCR is a
- 2 layer device
 - 3 layer device
 - 4 layer device with one gate *
 - 4 layer device with two gates
423. The advantage (s) of SCR over SCS is / are
- larger switching time and smaller V_H
 - larger switching time and large V_H
 - smaller switching time and smaller V_H
 - smaller switching time and larger V_H *
424. SCR uses
- no gate
 - one gate on the p-layer next to cathode *
 - one gate on the n-layer next to anode
 - two gates
425. In an SCR, the breakover voltage V_{BO}
- is independent of gate current
 - increases with the increase of positive gate current
 - decreases with the increase of positive gate current *
 - may increase or decrease with increase of gate current depending on temperature
426. In SCR, the turn-ON time
- is independent of V_g
 - decreases with increase of V_g *
 - varies as $V_g^{3/2}$
 - varies as $V_g^{5/2}$
- where V_g is the trigger voltage amplitude
427. In SCR, the turn-ON time
- is independent of anode current I_A
 - increases with increase of I_A *
 - varies as $1/I_A$
 - varies as $1/\sqrt{I_A}$
428. In SCR, the turn-ON time
- is independent of ambient temperature T
 - increases with increase of T *
 - varies $1/T$
 - varies as $1/T^2$
429. In SCR, the turn-OFF time
- increases with increase of T *
 - is independent of T
 - varies as $1/T$
 - varies as $1/T^2$
430. In SCR, the turn-OFF time
- increases with increase of anode current I_A *
 - is independent of I_A
 - varies $\frac{1}{I_A}$
 - varies a $\frac{1}{I_A^2}$
431. After firing an SCR, if the gate pulse is removed, the SCR current
- remains the same *
 - reduces to zero
 - rises up
 - rises a little and then falls to zero

432. An SCS is
 a. a pnpn diode with three terminals
 b. a pnpn diode with one gate
 c. a pnpn diode with two gates *
 d. a pnpn diode made of germanium
433. Triac is a
 a. 2 terminal bidirectional switch
 b. 3 terminal bidirectional switch *
 c. 2 terminal unilateral switch
 d. 3 terminal unilateral switch
434. Diac is a
 a. 2 terminal bidirectional switch *
 b. 2 terminal unilateral switch
 c. 2 terminal unilateral switch
 d. 3 terminal unilateral switch
435. Diac is a silicon device with
 a. 3 layers and one gate
 b. 3 layers and no gate *
 c. 4 layers and one gate
 d. 4 layers and no gate
436. Thermistor is used for measurement of power at
 a. audio frequencies
 b. high frequencies
 c. very high frequencies
 d. microwave frequencies *
437. Over temperature range of -60° to $+150^{\circ}$ C, sensor has temperature coefficient of resistance of about
 a. -0.5% per deg C b. -0.2% per deg C
 c. $+0.7\%$ per deg C * d. $+2.0\%$ per deg C
438. For Ge at room temperature, critical wavelength for photoconduction is
 a. 1.13 micron b. 1.73 micron *
 c. 11.3 micron d. 17.3 micron
439. For Si at room temperature, critical wavelength for photoconduction is
 a. 1.13 micron * b. 1.73 micron
 c. 11.3 micron d. 17.3 micron
440. Photoconductive cell most popularly used for visible light spectrum uses
 a. Ge b. Si
 c. G_AAs d. Cadmium sulphide *
441. In a photodiode, light is focussed to fall on
 a. p region only b. n-region only
 c. full p and n regions d. junction region only *
442. Response time of PIN photodiode is of the order of
 a. 0.1 ns b. 1 ns *
 c. 10 ns d. 1 milli-sec
443. In phototransistor, light is focussed to fall on
 a. emitter-to-base junction
 b. collector-to-base junction *
 c. base region only
 d. all the three regions of the transistor
444. An npn phototransistor has typical sensitivity of the order of
 a. 25 mA/m W/cm^2 b. 250 mA/m W/cm^2
 c. 2.5 mA/m W/cm^2 * d. 250 mA/m W/cm^2
445. Photovoltaic emf of a Ge photovoltaic cell is of the order of
 a. 0.1 volt b. 0.5 volt *
 c. 1.1 volt d. 1.72 volt
446. Photovoltaic emf of a Si photovoltaic cell is of the order of
 a. 0.1 volt * b. 0.5 volt
 c. 1.1 volt d. 1.72 volt
447. Conversion efficiency of a silicon solar cell is about
 a. 5% b. 10%
 c. 14% * d. 25%
448. A semiconductor photodiode uses
 a. photo-emissive effect
 b. photovoltaic effect
 c. photoconductive effect *
 d. none of these
449. LED gives off visible light from
 a. region of depletion layer *
 b. p region alone
 c. n region alone
 d. both p and n regions
450. LEDs have response time of the order of
 a. 0.1 ns b. 1 ns *
 c. 100 ns d. 1 ms
451. In LED, when excited electrons revert from conduction band to valence band, the phenomenon utilized is
 a. radioactive recombination *
 b. formation of photons
 c. energy transfer from one electron to other
 d. none of these
452. The emf across a photovoltaic cell is approximately proportional to
 a. F b. \sqrt{F}
 c. $\ln F$ * d. F^2
453. LEDs fabricated from Ga As emit radiation in the
 a. ultraviolet region b. infrared region *
 c. visible range d. none of these
454. LEDs fabricated from Ga As P emit radiation in the
 a. ultraviolet region b. infrared region
 c. visible range * d. none of these
455. In a varactor diode using alloy junction, the transition capacitance is proportional to

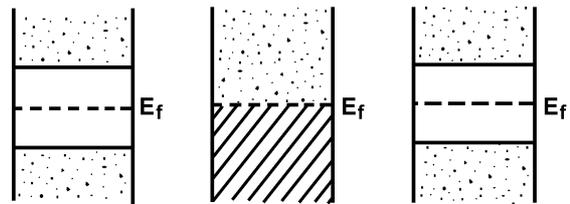
495. The electrons emitted by a thermionic emitter are called
 a. free electrons
 b. loose electrons
 c. thermionic electrons *
 d. bound electrons
496. The work function of an oxide - coated emitter is about
 a. 1.1 eV * b. 4 eV
 c. 2.63 eV d. 4.52 eV
497. The warm-up time of a directly heated cathode is that of indirectly heated cathode
 a. more than b. less than *
 c. same as d. data incomplete
498. The most commonly used emitter in the tubes of a radio receiver is
 a. tungsten b. thoriated - tungsten
 c. oxide - coated * d. none of the above
499. Field emission is utilised in
 a. vacuum tubes
 b. TV picture tubes
 c. gas - filled tubes
 d. mercury pool devices *
500. Oxide - coated emitters have electron emission of per watt of heating power.
 a. 5 - 10 mA b. 40 - 90 mA
 c. 50 - 100 mA d. 150 - 1000 mA *
501. The oxide - coated cathodes can be used for voltages upto
 a. 1000 V * b. 3000 V
 c. 4000 V d. 10000 V
502. One hole charge is
 a. 1 coulomb
 b. 1 eV
 c. 0.16×10^{-18} coulomb *
 d. -0.16×10^{-18} coulomb
503. Ions are
 a. same as electrons
 b. same as holes
 c. atoms with excess or deficient electrons *
 d. molecules with excess or deficient electrons
504. Insulating materials have the function of
 a. conducting very large currents
 b. preventing an open circuit between the voltage source and the load
 c. preventing a short circuit between conducting wires *
 d. storing very high currents
505. An ion is
 a. a free electron
 b. a proton
 c. an atom with unbalanced charges *
 d. a nucleus without protons
506. Which of the following is a semi-conductor ?
 a. Arsenic
 b. Gallium arsenide *
 c. Phosphorus
 d. Diamond
507. Which of the following is a tetravalent ?
 a. Calcium b. Quartz
 c. Germanium * d. Diamond
508. Which of the following is not a semi-conductor ?
 a. Silicon b. Diamond *
 c. Germanium d. Gallium Arsenide
509. Atoms held together by sharing of valence electron
 a. always have tendency to accept electrons
 b. have one or more holes
 c. have a weak bond which tends to break
 d. form a covalent bond *
510. The number of electrons in the outermost shell of Germanium is
 a. 2 b. 3
 c. 4 * d. 5
511. The outermost orbit in an atom cannot have
 a. more than 8 electrons *
 b. less than 4 electrons
 c. electrons of other atoms
 d. all of the above
512. Atomic number is the
 a. number of electrons in the outermost orbit
 b. number of protons in an atom *
 c. total number of protons, neutrons and electrons in an atom
 d. average number of neutrons in an atom
513. When n is the number of the shell, the maximum number of electrons in the shell can be
 a. n b. 2n
 c. n^2 d. $2n^2$ *
514. Which of the following statement about the valence electrons in germanium and silicon is correct ?
 a. Germanium has four valence electrons and silicon has two valence electrons
 b. Germanium has two valence electrons and silicon has four valence electrons
 c. Both germanium as well as silicon have two valence electrons each
 d. Both germanium as well as silicon have four valence electrons each *
515. Which of the following element belongs to the same group of periodic table as that of silicon and germanium?

- a. Boron b. Carbon *
 c. Sodium d. Phosphorus
516. Germanium and silicon belong to which group of periodic table ?
 a. III b. IV *
 c. VI d. VIII
517. Which of the following statement is correct ?
 a. both germanium and silicon have same number of electrons
 b. the number of electrons in silicon is more than that in germanium
 c. both germanium and silicon have 4 valence electrons each *
 d. The number of electrons in germanium as well as silicon is divisible by 4
518. An electron in the conduction band
 a. has lower energy than an electron in the valence band
 b. has a higher energy than an electron in the valence band *
 c. is always chargeless
 d. has tendency to leave the atom
519. A is a vacancy in the outer shell. It can attract and capture a nearby electron. This merging is called
 a. ion, doping b. electron, depletion
 c. hole, recombination * d. ion, excess hole
520. At absolute zero temperature, pure silicon acts like an because no free electrons exist in the semiconductor. Above absolute zero, energy dislodges some electrons from valance shells
 a. conductor, kinetic
 b. super conductor, potential
 c. semi - conductor, kinetic
 d. insulator, thermal *
521. Adding pentavalent or trivalent impurities to a pure semiconductor is called
 a. combination b. recombination
 c. doping * d. depleting
522. The n - type semiconductor has an of free electrons, and the p - type has an excess of
 a. holes, electrons b. shortage, holes
 c. excess, electrons d. excess, holes *
523. The majority carriers in an n - type semiconductor are the electrons, and the minority carriers are the
 a. free, holes * b. holes, free
 c. holes, electrons d. electrons, holes
524. In a p - type semiconductor, the majority carriers are and the minority carriers are
 a. ions, holes b. holes, ions
 c. holes, free electrons * d. free electrons, holes

525. Doped silicon is called
 a. intrinsic semiconductor
 b. doped semiconductor
 c. active semiconductor
 d. extrinsic semiconductor *

526. Match the following :

Column I	Column II
a. Metal	1. (i)
b. Semiconductor	2. (ii)
c. Insulator	3. (iii)

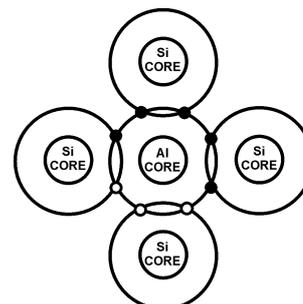


- (i) (ii) (iii)
- a. a - i, b - ii, c - iii b. a - ii, b - i, c - iii
 c. a - iii, b - ii, c - i d. a - ii, b - iii, c - i *

527. At absolute zero, a pure semiconductor behaves like an insulator because
 a. forbidden energy gap is reduced
 b. drift velocity of free electrons is very small
 c. no free electrons are available for current conduction *
 d. recombination of electrons and holes is slow
528. A results when silicon atoms combine into a solid piece of material. In this structure, each atom has four neighbours which share their electrons to produce a total of electrons in the valance shell of each atom.
 a. crystal, eight * b. solid, four
 c. PN junction, two d. NP junction, four

529. Pure silicon is called
 a. intrinsic semiconductor *
 b. doped semiconductor
 c. active semiconductor
 d. extrinsic semiconductor

530. The semiconductor shown in Fig. is
 a. intrinsic semiconductor
 b. p - type semiconductor *
 c. n - type semiconductor
 d. none of the above



531. Which of the following represents the semiconductor in order of increasing forbidden energy ?
- Ge, Si, GaAs, MgO *
 - Si, Ge, GaAs, MgO
 - MgO, GaAs, Si, Ge
 - MgO, Si, Ge, GaAs.
532. Which of the following intermetallic compound semiconductor has the least forbidden energy ?
- Gallium arsenide *
 - Gallium phosphide
 - Cadmium selenide
 - Cadmium telluride
533. Semiconductors
- can be used as thermistors
 - find applications in strain gauges
 - can be used as photoconductors
 - all of the above *
534. Semiconductors can be used for electronic cooling using the principle of
- thermoelectricity *
 - photoconductor
 - hall effect
 - any of the above
535. Match the following
- | Column A | Column B |
|------------------|----------------------------|
| a. conductor | i. doped |
| b. Semiconductor | ii. acceptor atom |
| c. Hole | iii. 4 - valence electrons |
| d. Extrinsic | iv. valence. electron |
- a - iii, b - iv, c - i, d - ii
 - a - iv, b - i, c - ii, d - iii
 - a - iii, b - i, c - iv, d - ii
 - a - iv, b - iii, c - ii, d - i *
536. An external voltage source is applied to a p - type semiconductor. If the left end of the crystal is positive and the right end is negative then
- holes flow to the right and electrons flow to the left *
 - holes flow to the left and electrons flow to the right
 - majority carriers will be electrons and minority carriers will be holes
 - none of the above
537. Match the following
- | Column A | Column B |
|--------------------|-------------------------------------|
| a. Covalent bond | i. energy level of free electrons |
| b. Forbidden gap | ii. shared electron |
| c. Conduction band | iii. free electrons fall into holes |
| d. Recombination | iv. unstable orbits |
- a - i, b - ii, c - iii, d - iv
 - a - ii, b - iv, c - i, d - iii *
- c. a - iii, b - iv, c - i, d - ii
d. a - iv, b - i, c - ii, d - iii
538. The polarity of the hole charges in p - type semiconductor is
- positive *
 - negative
 - neutral
 - either positive or negative
539. All of the following are insulators EXCEPT
- paper
 - paraffin oil
 - tungsten *
 - glass
540. Which of the following material has the highest melting point and the lowest specific resistance ?
- Tungsten *
 - Nichrome
 - Manganin
 - Constantan
541. Which of the following represents materials in increasing order of specific resistance ?
- Steel, Gold, Aluminium, Copper
 - Gold, Aluminium, Copper, Steel
 - Gold, Copper, Aluminium, Steel *
 - Copper, Gold, Aluminium, Steel
542. Which of the following is trivalent ?
- Boron
 - Indium
 - Aluminium
 - All of the above *
543. The number of valence electrons in boron is
- 1
 - 2
 - 3 *
 - 4
544. As the temperature of the semiconductor increases
- its resistivity increases
 - its conductivity increases *
 - its atomic number decreases
 - its temperature coefficient becomes zero
545. A doped semiconductor is also known as
- a semiconductor
 - diffused semiconductor
 - intrinsic semiconductor
 - extrinsic semiconductor *
546. As the temperature of an intrinsic semiconductor is increased
- more holes are created in the conduction band
 - energy of the atoms is increased *
 - holes and free electrons get fused together
 - none of the above
547. A piece of silicon is doped with 7×10^{15} boron atoms/cm³ and 3×10^{15} phosphorus atoms/cm³. The resulting material will be
- p - type with hole concentration more than electron concentration
 - p - type with electron concentration more than hole concentration *
 - n - type with electron concentration more than hole

- concentration
- d. n - type with hole concentration more than electron concentration
- b. it loses its charge
c. it is at higher temperatures
d. it is in a completely filled bond *
548. What are the two most common crystalline or orientation utilized for silicon processing ?
a. (101) and (001) b. (001) and (101)
c. (111) and (100) * d. (110) and (011)
549. Semiconductors are sensitive to
a. light energy b. magnetic fields
c. heat d. all of the above *
550. The advantage of semiconductor strain gauge over other gauge material is
a. light weight b. high sensitivity *
c. easy adoptability d. all of the above
551. Semiconductors can be used as thermogenerators which directly convert
a. heat energy into electrical energy *
b. electrical energy into heat
c. magnetic energy into heat
d. heat into magnetic energy
552. Germanium is
a. amorphous solid b. liquid crystal
c. crystalline * d. transitional solid
553. The forbidden energy gap for silicon is
a. 0.3 eV b. 0.72 eV
c. 1.1 eV * d. 1.73 eV
554. The forbidden energy gap for germanium is
a. 0.31 eV b. 0.72 eV *
c. 1.11 eV d. 1.73 eV
555. Which of the following semiconductor has the lowest forbidden energy gap ?
a. Indium antimonide *
b. Zinc oxide
c. Cadmium telluride
d. Gallium phosphide
556. Which of the following semiconductor has the highest forbidden gap ?
a. Diamond b. Cadmium sulphide
c. Silicon d. Magnesium oxide *
557. A semiconductor has
a. zero temperature coefficient of resistance
b. positive temperature coefficient of resistance
c. negative temperature coefficient of resistance *
d. none of the above
558. One electron volt is the same as
a. 1 Joule b. 1.6×10^{-6} Joule
c. 1.6×10^{-12} Joule d. 1.6×10^{-19} Joule *
559. An electron will not contribute to electric current when
a. it strikes a positive ion
560. When an electron breaks of covalent bond and moves away
a. the semiconductor becomes a conductor
b. a vacancy is created in the broken covalent bond*
c. the conductivity of the material increases
d. more ions are produced
561. The concentration of minority carriers, in case of N - type semiconductors mainly depends upon
a. the purity of semiconductor material
b. the doping technique
c. distribution of impurities in semiconductor material
d. the temperature of the material *
562. Which of the following is a trivalent element ?
a. Antimony b. Indium *
c. Arsenic d. Phosphorus
563. The movement of a hole results from
a. the vacancy filled by a valance electron from the neighboring atom *
b. excitation due to high temperature
c. change in number of protons in the atom
d. none of the above
564. A donor impurity must have only
a. two valence electrons *
b. three valence electrons
c. four valence electrons
d. five valence electrons
565. The conduction band is
a. the region of free electrons
b. a range of energies corresponding to the energies of the free electrons *
c. always above the forbidden level
d. concentrates holes for the flow of current
566. A n - type semiconductor has
a. electrons as majority carriers and holes as minority carriers *
b. electrons as minority carriers and holes as majority carriers
c. only electrons as carriers
d. only holes as carriers
567. A p - type semiconductor results when
a. a trivalent impurity is added to an intrinsic semiconductor *
b. a pentavalent impurity is added to an intrinsic semiconductor
c. either a trivalent or pentavalent impurity is added to an intrinsic semiconductor
d. any of the above
568. At room temperature when some voltage is applied to an intrinsic semiconductor

- a. Zener breakdown *
- b. Avalanche breakdown
- c. either of a. or b. above
- d. none of the above

609. Which of the following statement is not valid in case of a holes ?

- a. holes can be considered as a net positive charge
- b. holes may constitute an electric current
- c. holes can exist in any material including conductors*
- d. holes exist in silicon as well as germanium

610. PN junction failure above 8 V is caused predominantly due to

- a. Zener breakdown
- b. Avalanche breakdown *
- c. Either of a. or b. above
- d. none of the above

611. In the energy band diagram of a P - type semiconductor

- a. the acceptor band is nearer to the valance band *
- b. the acceptor band is nearer to the conduction band
- c. the donor band is near the valance band
- d. the donor band is near to conduction band

612. A silicon sample is doped with 2×10^{16} acceptors / cm^3 and 5×10^{15} donors / cm^3 . What type of impurity and in what concentration should be added to make the equilibrium electron and hole concentrations the same at room temperature ?

- a. 5×10^{12}
- b. 5×10^{14}
- c. 5×10^{16} *
- d. 5×10^{18}

613. Match the following

Column - I (Material)	Column - II (Approximate Resistance Ω / cm^3)
1. Silver	i. 10^{-5}
2. Pure Silicon	ii. 50×10^3
3. Pure Germanium	iii. 50
4. Mica	iv. 10^{12}

- a. 1 - (i), 2 - (ii), 3 - (iii), 4 - (iv) *
- b. 1 - (i), 2 - (iii), 3 - (ii), 4 - (iv)
- c. 1 - (i), 2 - (iii), 3 - (iv), 4 - (ii)
- d. i - (iv), 2 - (ii), 3 - (iii), 4 - (i)

614. Fermi energy is the amount of energy which

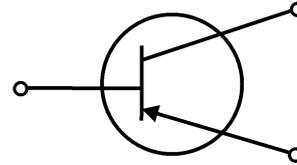
- a. a hole can have at room temperature
- b. must be given to a hole to move it to valence band
- c. a valence electron can have at room temperature
- d. must be given to an electron to move it to conduction band *

615. In a transistor with normal bias

- a. the emitter junction has a low resistance *
- b. the emitter junction is reverse biased
- c. the emitter junction offers high resistance
- d. none of the above

616. Fig. 3 represents a

- a. Tunnel diode
- b. JFET
- c. PNP transistor *
- d. NPN transistor



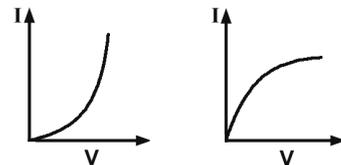
617. In a PNP transistor

- a. the electrons are the minority carriers in the base region
- b. the base is made by doping the intrinsic semiconductor with indium
- c. the emitter injects holes into the base region *
- d. the principal current carriers are electrons

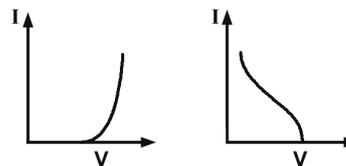
618. Which of the following is valid for both PNP as well as NPN transistors ?

- a. The EB region is forward biased for active operation *
- b. The electrons are the minority carriers in the base region
- c. When biased in the active region, current flows into emitter terminal
- d. The emitter injects holes into the base region

619. In Fig. * the forward characteristics of a silicon diode is represented by



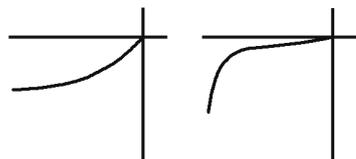
(A) (B)



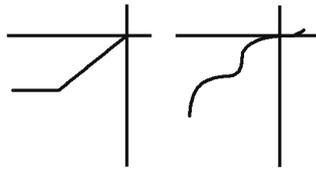
(C) (D)

- a. Fig. (A)
- b. Fig. (B)
- c. Fig. (C) *
- d. Fig. (D)

620. The reverse bias characteristics of a semiconductor diode is shown in



(A) (B)



(C) (D)

- a. Fig. (A)
- b. Fig. (B) *
- c. Fig. (C)
- d. Fig. (D)

621. Two equations for diode current are given below :

$P : I = I_0 (e^{40 V} - 1)$

$45Q : I = I_0 (e^{20 V} - 1)$

One of the equations is for silicon and the other one for germanium. It can be concluded that

- a. equation P is for silicon and equation Q is for germanium
- b. equation P is for germanium and equation Q is for silicon *

622. The forward current for germanium diode is P microamperes at 25°C. At 75°C for the same diode; the forward current will be nearly

- a. P/2 microamperes
- b. P/4 microamperes
- c. 2P microamperes
- d. 4P microamperes *

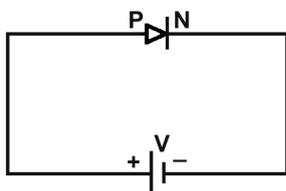
623. A PN junction exhibits a transition capacitive effect of several farads in reverse bias, but may have many farads of diffusion capacitance in the forward biased state

- a. micro, pico
- b. pico, micro *
- c. milli, milli
- d. milli, micro

624. When an impurity metal on the ratio of 1 atom per 10 million atoms of germanium is doped, the electrical conductivity of germanium increases in the ratio of approximately

- a. 10
- b. 100
- c. 1000 *
- d. 10000

625. The PN junction shown in Fig. below is



- a. Reverse biased
- b. Forward biased *
- c. Unbiased

626. The maximum temperature a silicon junction can withstand without damage is in the range

- a. 60 to 100°C
- b. 160 to 225 °C *
- c. 240 to 300 °C
- d. 275 to 325 °C

627. A PN junction is formed in a process which may be of

- a. the grown type
- b. alloyed type

- c. diffused type
- d. any of the above *

628. A forward biased PN junction has the positive terminal applied to the side and the negative to the side.

- a. P, N *
- b. N, P
- c. N, N
- d. P, N

629. The reverse saturation current of a diode increases approximately

- a. 1 % per degree C
- b. 7 % per degree C *
- c. 23 % per degree C
- d. 47 % per degree C

630. A silicon diode is operating at 25°C with a forward bias of 0.6 V and a current of 0.5 A. If the current is held constant at 0.5 A and the temperature of the device is lowered to - 45°C, the voltage that will exist across the diode will be nearly

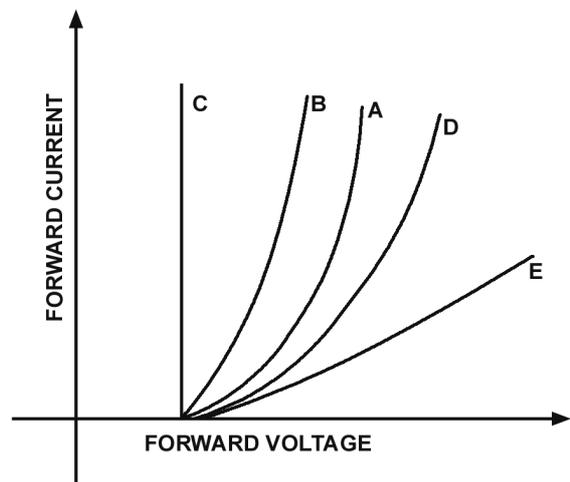
- a. 0.65 V *
- b. 0.60 V
- c. 0.59 V
- d. 0.55 V

631. The maximum temperature a germanium junction can withstand damage is in the range

- a. 60 to 100°C *
- b. 150 to 200 °C
- c. 250 to 300 °C
- d. 350 to 400 °C

632. Part of the silicon diode characteristic at 25°C is shown by curve A. At - 25 °C and + 75°C, the characteristics will be represented by curves

- a. B and C respectively
- b. D and E respectively
- c. B and D respectively *
- d. A only



633. In a PN junction when the applied voltage overcomes the potential, the diode current is large, which is known as

- a. resistance, reverse bias
- b. reverse, reverse bias
- c. depletion, negative bias
- d. barrier, forward bias *

634. When a PN junction is reverse - biased

- a. the barrier tends to break down
 b. holes and electrons tend to concentrate towards the junction
 c. holes and electrons tend to move away from the junction *
 d. none of the above
635. In a semiconductor diode, the barrier potential offers
 a. opposition to free electrons in the N - region and holes in the P - region
 b. opposition to minority carriers in P - region and majority carriers in N - region
 c. opposition to minority carriers in both regions
 d. opposition to only majority carriers in both regions*
636. In an unbiased PN junction
 a. the junction current at equilibrium is zero as charges do not cross the junction
 b. the junction current at equilibrium is zero as equal but opposite carriers are crossing the junction *
 c. the junction current reduces with rise in temperature
 d. the junction current is due to minority carriers only
637. In case the reverse bias voltage of a PN junction is increased within limits
 a. the reverse saturation current will increase
 b. the forward saturation current will be zero
 c. the reverse saturation current will remain unaffected *
 d. the reverse saturation current will decrease
638. Which device is preferred for higher temperature applications ?
 a. Silicon devices *
 b. Germanium devices
 c. Diamond devices
 d. All are equally good
639. Silicon device is preferred for higher temperature applications as compared to germanium because
 a. Silicon has lower atomic number as compared to germanium
 b. Silicon is thermally more stable
 c. Silicon has lower weight to specific volume ratio
 d. reverse saturation current in case of silicon is less than that in case of Germanium *
640. Which is the most heavily doped region in a transistor?
 a. Emitter *
 b. Collector
 c. Base
 d. All regions are equally doped
641. A 1N2615 silicon diode has a reverse current of 10 μ A. The forward current flowing through the diode will be maximum when the forward bias voltage is
 a. 0.3V
 b. 0.4V
 c. 0.5V
 d. 0.6V *
642. A silicon diode is operating at 25°C with a forward bias of 0.6 V and a current of 0.5 A. If the current is held constant at 0.5 A and the temperature of the device is raised to 75 °C, the voltage across the diode is likely to be
 a. 0.49 V *
 b. 0.60 V
 c. 0.66 V
 d. 0.75 V
643. In PN junction, recombination produces the layer which contains immobile charged atoms
 a. combined
 b. restruction
 c. depletion *
 d. re - established
644. As a PN junction is forward biased
 a. the barrier tends to breakdown
 b. the depletion region decreases *
 c. holes as well as electrons tend to drift away from the junction
 d. none of the above
645. In the depletion region of a PN junction
 a. there are no mobile charges *
 b. there are no currents
 c. there are neither mobile charges nor currents
 d. none of the above
646. For a PN junction when the N-side is more positive than the P - side, the diode is said to be
 a. forward biased and only a small current exists
 b. forward biased and a large current exists
 c. reverse biased and only a small current exists *
 d. forward biased and a large current exists
647. In a depletion region of a PN junction
 a. holes and electrons drift away from the junction
 b. there is hole concentration on P - side and electron concentration on N - side
 c. P - side is positively charged and N - side is negatively charged
 d. N - side is positively charged and P - side is negatively *
648. A PN diode is a crystal with P material on one side of the junction and N material on the other side. After the junction is formed
 a. minority carriers diffuse across the junction and recombine
 b. majority carriers diffuse across the junction and recombine *
 c. both majority and majority carriers diffuse across the junction in equal numbers
 d. none of the above
649. The potential barrier existing across a PN junction corresponds to
 a. forward bias of the junction
 b. reverse bias of the junction
 c. width of the barrier
 d. height of the barrier *
650. The potential barrier existing across a PN junction

- a. facilitates combination of holes and electrons
 b. prevents total recombination of holes and electrons*
 c. neutralises doped impurities with semiconductor material forming neutral compound
 d. none of the above
651. Light falls on one end of a long open - circuited n - type semiconductor bar. For low level injection
 a. electron diffusion current will be more than hole diffusion current *
 b. electron diffusion current will be less than hole diffusion current
 c. electron diffusion current will be equal to the hole diffusion current
 d. electron diffusion current will be insignificantly low
652. Application of forward bias to a junction diode reduces
 a. minority carrier current to zero
 b. majority carrier current to zero
 c. the potential barrier *
 d. all of the above
653. Which of the following statement is false ?
 a. in a p - type semiconductor, as the density of acceptor atoms N_A is increased, the fermi level shifts towards the valence band
 b. At 0°K, all quantum states with energy less than Fermi level E_f are occupied
 c. Fermi level is the same for all metals at 0°K *
 d. In intrinsic semiconductor, the fermi level lies nearly midway in the forbidden band.
654. A valanche break down in a semiconductor diode occurs when
 a. cracks develop on the surface
 b. temperature exceeds beyond permissible levels
 c. forward current exceeds the specified value
 d. reverse bias exceeds a certain value *
655. Light falls on one end of a long open - circuited n - type semiconductor bar. For low level injection the hole current is due predominantly to
 a. drift
 b. diffusion *
 c. both drift and diffusion
 d. none of the above
656. Excess reverse bias of a PN junction diode may result in
 a. Hall's breakdown
 b. loss of doped impurities
 c. Zener breakdown
 d. Avalanche breakdown *
657. At high forward voltages, a junction diode may
 a. become noisy
 b. loose doped impurities
 c. burn out *
 d. conduct more current
658. In a p - type semiconductor, as the density of acceptor atoms N_s is increased, the Fermi level
 a. shifts towards the valance band *
 b. shifts away from the valance band
 c. remains unaffected
659. For a PN junction, the junction current will be zero when
 a. the two junctions are short circuited
 b. either minority carrier or majority carriers disappear
 c. the number of minority carriers crossing the junction equals the number of majority carriers *
 d. holes and electrons get neutralized by equal numbers
660. When a PN junction is forward biased the width of its depletion layer is and when the junction is reverse biased the width of its depletion layer is
 a. increased, decreased
 b. decreased, increased *
 c. increased, increased
 d. decrease, decreased
661. Fermi level represents the energy level with probability of its occupation of
 a. 25 %
 b. 50 % *
 c. 75 %
 d. 99 %
662. The diffusion current is proportional to
 a. applied electric field
 b. concentration gradient of charge carriers *
 c. inverse of the applied electric field
 d. inverse of the concentration gradient of charge carriers
663. The number of minority carriers crossing the junction of a diode depends primarily on the
 a. extent of forward bias
 b. rate of thermal generation of electron - hole pairs *
 c. magnitude of the potential barrier
 d. concentration of doping impurities
664. Under breakdown conditions of the diode
 a. all holes get filled with electrons
 b. excess electrons are released creating more holes
 c. leakage current is negligibly low
 d. leakage current increases remendously *
665. The ratio of the diffusion constant for hole, D_p , to the mobility of holes is
 a. directly proportional to temperature T *
 b. inversely proportional to temperature T
 c. inversely proportional to square of temperature T
 d. independent of temperature T
666. In an n - type semiconductor as the density of donor atoms N_D is increased, the Fermi level
 a. shifts away from the conduction band
 b. shifts towards the conduction band *
 c. remains unaffected

667. The space charge region in a junction diode contains charges that are
 a. fixed donor and acceptor ions *
 b. mobile donor and acceptor ions
 c. minority carriers only
 d. majority carriers only
668. Light falls on one end of a long open circuited n - type semiconductor bar. For low level injection the electron current is due predominantly to
 a. drift only
 b. diffusion only
 c. both drift and diffusion *
 d. none of the above
669. The capacitance of a reverse biased PN junction
 a. is insignificantly low
 b. decreases as reverse bias is increased
 c. increases as reverse bias is decreased *
 d. increases as reverse bias is increased
670. Bulk resistance of diode is
 a. the sum of resistance values of M - material and R - material *
 b. the sum of half the resistance value of N - material and the P - material
 c. equivalent resistance of the resistance values of P and N materials in parallel
 d. none of the above
671. Charge carrier movement resulting from an initial concentration of charge carriers is known as
 a. drift current b. diffusion current *
 c. charge current d. carrier current
672. The process in which the conduction band electrons fill the valence band holes, is known as
 a. homecoming b. recombination
 c. recombination * d. ionic bonding
673. Which of the following is not a semiconductor ?
 a. Lead telluride b. Selenium
 c. Silicon carbide d. Tungsten carbide *
674. Semiconductors are widely used in
 a. thermistor b. photocell
 c. diodes d. all of the above *
675. Knee voltage for silicon is nearly
 a. 0.07V b. 0.17V
 c. 0.7V * d. 1.72V
676. The barrier potential for germanium
 a. 0.1V b. 0.3V *
 c. 0.5V d. 0.7V
677. A Ge atom contains
 a. four orbits b. only two orbits
 c. 5 - valence holes d. 4 - valence electrons *
678. Two atoms of the semiconductor are held together by
 a. valance bond * b. ionic bond
 c. metallic bond d. none of these
679. Intrinsic semiconductor at absolute zero behaves as
 a. insulator * b. metal
 c. semiconductor d. none of these
680. An electron in conduction band has
 a. no charge
 b. higher energy than electron in the valance band *
 c. lower energy than the electron in the valance band
 d. none of these
681. At room temperature when voltage is applied to the intrinsic semiconductor
 a. electrons move towards the positive terminal and holes move towards the negative terminal *
 b. both holes and electrons move towards the positive terminal
 c. booth holes and electrons move towards the negative terminal
682. With the increase in the temperature of the intrinsic semiconductor
 a. energy of atom increases *
 b. holes are generated in the conduction band
 c. resistance of the semiconductor increases
 d. atomic radius decreases
683. Vth group elements are called
 a. donor impurity * b. acceptor impurity
 c. none of these
684. The p - type impurities create
 a. excess number of electrons
 b. excess number of holes *
 c. excess number of ionized positive charge
 d. none of these
685. Small amount of antimony if added to silicon
 a. its resistance increases
 b. the silicon will become p - type
 c. it contains more free electrons than holes *
686. If small amount gallium is added to germanium
 a. it becomes p - type material *
 b. it has more numbers of electrons
 c. it becomes an insulator
 d. none of these
687. Conduction band is
 a. the same as valance band
 b. always located at the top of the crystal
 c. is called forbidden band
 d. the energy band above forbidden band *
688. Forbidden band is
 a. above conduction band
 b. below valance band
 c. between valance and conduction band *
 d. none of these

689. The concentration of minority carriers in the n - type semiconductor depends on
 a. doping technique
 b. temperature of the material
 c. quality of intrinsic Ge or Si *
 d. number of donor atoms
690. A neutral semiconductor
 a. has no free charge carrier
 b. has equal no. of electrons and holes *
 c. has no minority carrier
 d. has no majority carrier
691. A p - type material is
 a. neutral * b. negatively charged
 c. positively charged d. none of these
692. A n - type material has
 a. electrons as majority carriers
 b. holes as majority carriers
 c. both positive and negative charge carriers are equal in number *
 d. none of these
693. When an atom is ionized, it releases
 a. negative charge carrier *
 b. positive charge carrier
 c. negative ion
 d. positive ion
694. When an atom loses an electron it becomes
 a. positively charged *
 b. negatively charged ion
 c. electrically neutral
 d. positive charge carrier
695. Resistivity of semiconductor depends upon
 a. shape and its length
 b. its carrier concentration *
 c. neither shape nor carrier concentration
 d. none of these
696. A n - type material induces an impurity energy level in
 a. the energy gap *
 b. conduction band
 c. valance band
 d. none of these
697. The process of doping
 a. increases conductivity *
 b. decreases conductivity
 c. neither increase nor decreases conductivity
 d. none of these
698. Resistivity of a good conductor is
 a. 10^{-8} ohm - m *
 b. 10^8 ohm - m
 c. 10^6 ohm - m
 d. 10^{12} ohm - m
699. Resistivity of a good insulator is
- a. 10^{-8} ohm-m b. 10^8 ohm-m
 c. 10^{10} or 10^{12} ohm-m * d. 10^{-10} or 10^{-12} ohm-m
700. Semiconductor material includes
 a. only elements
 b. only intermetallic compounds
 c. both elements and intermetallic compounds *
 d. none of these
701. Every time a co - valent bond is broken it results in
 a. free electron b. free hole
 c. electron hole pair * d. none of these
702. Intrinsic semiconductor contains
 a. more number of electrons
 b. more number of holes
 c. equal number of electrons and holes *
 d. equal no. of negative and positive immobile charge
703. On an average at 25 °C in a Si crystal out of 10^{19} bonds
 a. 1 is broken
 b. no bond is broke *
 c. infinite bonds are broken
 d. none of these
704. At room temperature in silicon out of 10^{10} bonds
 a. 1 bond is broken *
 b. infinite bonds are broken
 c. no bonds are broken
 d. none of these
705. Normally used semiconductor materials are
 a. C, Na b. Si, Ge *
 c. Ga - As - P d. none of these
706. Good conductors are
 a. silver, aluminium, copper etc. *
 b. glass, quartz
 c. Ge, Si
 d. none of these
707. Weigh the increase in temperature resistivity of a conductor
 a. increases * b. decreases
 c. remains constant d. none of these
708. With the increase in temperature the resistivity of the semiconductor
 a. increases
 b. decreases *
 c. neither increases nor decreases
 d. none of these
709. At higher temperature which material conducts better
 a. semiconductor * b. metal
 c. insulator d. none of these
710. Temperature coefficient of semiconductor is
 a. positive
 b. negative *
 c. neither positive nor negative

- d. none of these
711. Extrinsic semiconductor is
 a. pure semiconductor
 b. impure semiconductor *
 c. neither pure nor impure
 d. none of these
712. Conductivity of a semiconductor can be controlled by
 a. adding impurity *
 b. increasing size
 c. changing temperature
 d. none of these
713. A semiconductor is called intrinsic even if impurity is
 a. one part in hundred million parts of semiconductor*
 b. 100 in 100 million parts of semiconductor
 c. 1000 in 100 million parts of semiconductor
 d. none of these
714. In an intrinsic silicon the band gap is
 a. 1.12 eV * b. 0.7 eV
 c. 2.0 eV d. 0.2 eV
715. In an intrinsic Ge the band gap is
 a. 1.12 eV b. 0.7 eV *
 c. 0.2 eV d. 1.6 eV
716. Conductivity of pure Ge is approximately
 a. 2.2 S/m * b. 5×10^{-4} S/m
 c. 5×10^4 S/m d. none of these
717. Conductivity of pure Si is nearly
 a. 2.3×10^9 S/m b. 5×10^{-4} S/m *
 c. 3.85×10^7 S/m d. none of these
718. Conductivity of Al is
 a. 3.85×10^7 S/m * b. 6.25×10^{-7} S/m
 c. 5×10^{-4} S/m d. none of these
719. Conductivity of glass is
 a. 1.54 S/m b. 5.88×10^{-12} *
 c. 10^{-16} S/m d. none of these
720. Conductivity of hard rubber is
 a. 5×10^{-4} S/m b. 5.88×10^{-12} S/m *
 c. 10^{-16} S/m d. none of these
721. Mobility of holes in intrinsic Si is
 a. $0.048 \text{ m}^2 / \text{V} - \text{sec} *$
 b. $0.135 \text{ m}^2 / \text{V} - \text{sec}$
 c. $1350 \text{ m}^2 / \text{V} - \text{sec}$
 d. $480 \text{ m}^2 / \text{V} - \text{sec}$
722. Mobility of electrons in intrinsic Si is
 a. $0.135 \text{ m}^2 / \text{V} - \text{sec} *$
 b. $0.048 \text{ m}^2 / \text{V} - \text{sec}$
 c. $480 \text{ m}^2 / \text{V} - \text{sec}$
 d. $13.5 \text{ m}^2 / \text{V} - \text{sec}$
723. Mobility of electrons in intrinsic Ge is
 a. $0.39 \text{ m}^2 / \text{V} - \text{sec} *$
 b. $0.19 \text{ m}^2 / \text{V} - \text{sec}$
 c. $390 \text{ m}^2 / \text{V} - \text{sec}$
 d. $190 \text{ m}^2 / \text{V} - \text{sec}$
724. Mobility of holes in intrinsic Ge is
 a. $0.39 \text{ m}^2 / \text{V} - \text{sec}$
 b. $0.19 \text{ m}^2 / \text{V} - \text{sec} *$
 c. $3900 \text{ m}^2 / \text{V} - \text{sec}$
 d. $1900 \text{ m}^2 / \text{V} - \text{sec}$
725. Carrier density in intrinsic Si is
 a. $1.5 \times 10^{16} / \text{m}^3 *$ b. $15 \times 10^6 / \text{m}^3$
 c. $150 \times 10^6 / \text{m}^3$ d. none of these
726. Electron hole pair in intrinsic Ge crystal at 300 K is nearly
 a. $2.5 \times 10^{19} / \text{m}^3 *$ b. $240 \times 10^{19} / \text{m}^3$
 c. $2400 \times 10^{19} / \text{m}^3$ d. none of these
727. Resistivity of intrinsic Si is nearly
 a. 2300 ohm-m * b. 23 ohm-m
 c. 0.23 ohm-m d. none of these
728. Resistivity of intrinsic Ge is nearly
 a. 0.46 ohm-m * b. 46 ohm-m
 c. 460 ohm-m d. none of these
729. The value of q/kT at room temperature is approximately
 a. 40/V * b. 400/V
 c. 0.4/V d. none of these
730. The conduction band in intrinsic semiconductor is
 a. above the valence band *
 b. below the valence band
 c. in the valence band
 d. none of these
731. Mobile electrons are found in
 a. conduction band *
 b. valence band
 c. below the valence band
 d. in the band gap
732. Mobile hole are found in
 a. conduction band
 b. valence band *
 c. below the valence band
 d. in the band gap
733. Fermi level in the intrinsic Si / Ge is
 a. in the middle of the band gap *
 b. near the valence band
 c. near the conduction band
734. The energy required to dislodge electrons from n - type Si is
 a. 0.05 eV * b. 5 eV
 c. 50 eV d. none of these

735. The Donor energy band is available in n - type material in the
 a. conduction band
 b. valance band
 c. in the band gap *
 d. none of these
736. The acceptor energy band is available in p - type material in the
 a. conduction band * b. conduction band
 c. in the band gap d. none of these
737. The diffusion constant of electron in Si is
 a. $350 \times 10^{-4} \text{ m}^2 / \text{sec}^*$
 b. $0.34 \times 10^{-4} \text{ m}^2 / \text{sec}$
 c. $3400 \times 10^{-4} \text{ m}^2 / \text{sec}$
 d. none of these
738. The diffusion constant of holes in Si is
 a. $12 \times 10^{-4} \text{ m}^2 / \text{sec}^*$
 b. $0.13 \times 10^{-4} \text{ m}^2 / \text{sec}$
 c. $1300 \times 10^{-4} \text{ m}^2 / \text{sec}$
 d. none of these
739. The diffusion constant of electrons in Ge is
 a. $100 \times 10^{-4} \text{ m}^2 / \text{sec}^*$
 b. $.99 \times 10^{-4} \text{ m}^2 / \text{sec}$
 c. $9900 \times 10^{-4} \text{ m}^2 / \text{sec}$
 d. none of these
740. The diffusion constant of holes in Ge is
 a. $49 \times 10^{-4} \text{ m}^2 \text{ sec}^*$
 b. $0.47 \times 10^{-4} \text{ m}^2 / \text{sec}$
 c. $4700 \text{ m}^2 / \text{sec}$
 d. none of these
741. The density of Ge at 25°C is
 a. $5.33 \times 10^9 \text{ kg/m}^3^*$
 b. $533 \times 10^9 \text{ kg/m}^3$
 c. $0533 \times 10^9 \text{ kg/m}^3$
742. The density of Si at 25°C is
 a. $2.33 \times 10^9 \text{ kg/m}^3^*$
 b. $233 \times 10^9 \text{ kg/m}^3$
 c. $0.0233 \times 10^9 \text{ kg/m}^3$
743. The intrinsic carrier concentration of electron in Ge at 25°C is
 a. $2.5 \times 10^{10} \text{ Atoms/m}^3^*$
 b. $0.025 \times 10^{19} \text{ Atoms/m}^3$
 c. $250 \times 10^{19} \text{ Atoms/m}^3$
744. The majority carrier in n - type material are
 a. electrons *
 b. holes
 c. ionized positive charge
745. The minority carrier in n - type material are
 a. electrons
 b. holes *
 c. ionized negative charge
746. The majority carriers in p - type material are
 a. holes *
 b. electrons
 c. immobile positive charge
747. In order to get excess electrons from the intrinsic semiconductor one can add to tetra valent element
 a. pentavalent element *
 b. trivalent element
 c. tetravalent element
748. In order to get excess holes from the intrinsic semiconductor one can add to tetra valent element
 a. pentavalent element
 b. trivalent element *
 c. tetravalent element
749. Electrons in the outermost orbit are called
 a. valence electrons *
 b. conduction electrons
 c. donor electrons
750. Energy of electrons in bigger orbit is
 a. higher *
 b. lower
 c. constant
751. The forces holding the Si / Ge atoms together in a crystal are called
 a. valance bond *
 b. ionic bond
 c. metallic bond
752. Doped crystal is called
 a. intrinsic
 b. extrinsic *
 c. both of the above
753. Velocity of electron is
 a. proportional to its mobility *
 b. inversely proportional to its mobility
 c. constant
754. Velocity of holes / electrons are proportional to
 a. electric filled *
 b. magnetic field
 c. inverse of magnetic field
755. Ionization energy of As, P and Sb in Ge are arranged in sequence as
 a. 0.045 eV, 0.049eV, 0.039eV *
 b. 0.049eV, 0.039eV, 0.045eV
 c. 0.039eV, 0.045eV, 0.049eV
756. Ionization energy of As, P and Sb elements in Si crystal are
 a. higher than that in Ge *
 b. lower than that in Ge
 c. equal to Ge
757. Ionization energy decreases slightly with

- a. increasing impurity contents
b. decreasing impurity contents
c. remains constant
758. An intrinsic semiconductor is
a. pure *
b. impure
c. free from impurity
759. The intrinsic semiconductor has
a. more electrons
b. more holes
c. none of the two *
760. At room temperature the intrinsic semiconductor behaves as
a. metal
b. semiconductor
c. insulator *
761. The extrinsic semiconductor at room temperature has
a. free charge carriers
b. no free charge carriers *
c. none of these
762. An n - type material has more numbers of
a. free electrons *
b. free holes
c. none of the above
763. An p - type material has more numbers of
a. free electrons
b. free holes *
c. none of the above
764. The resistance of a material is expressed as
a. $\frac{L}{qA(n\mu_n + p\mu_p)}$ *
b. $\frac{qA(n\mu_n + p\mu_p)}{L}$
c. $\frac{AL}{q(n\mu_n + p\mu_p)}$
765. The resistivity of a material is expressed as :
a. $\frac{L}{qA(n\mu_n + p\mu_p)}$
b. $\frac{qA(n\mu_n + p\mu_p)}{L}$
c. $\frac{1}{q(n\mu_n + p\mu_p)}$ *
766. The conductivity of a material is expressed as
a. $qA(n\mu_n + p\mu_p)$
b. $q(n\mu_n + p\mu_p)$ *
- c. $\frac{1}{q(n\mu_n + p\mu_p)}$
767. The Fermi level of an intrinsic semiconductor lies
a. near conduction band
b. near valence band
c. in the middle of the valence and conduction band*
768. The Fermi function is expressed as
a. $\frac{1}{1+\exp(E - E_F)/KT}$ *
b. $\frac{1}{1+\exp-(E - E_F)/KT}$
c. $\exp-(E - E_F)/KT$
769. The primary bonds are
a. ionic, metallic and vander waal bonds
b. ionic, covalent and vander waal bonds
c. ionic, covalent and metallic *
770. The mean free path in an ideal crystal without imperfections and impurities is
a. infinite at OK *
b. zero at OK
c. infinite at all temperatures
d. zero at all temperatures
771. Glass and backellite are
a. crystalline
b. amorphous *
c. solid solution
772. With increase in temperature, average velocity of atom
a. increases *
b. decreases
c. remains constant
773. The Fermi level in an n - type material is expressed as
a. $E_c - KT \ln\left(\frac{N_c}{n_n}\right)$ *
b. $E_c - KT \ln\left(\frac{N_c}{n_n}\right)$
c. $E_c - KT \ln\left(\frac{N_D}{n_n}\right)$
774. The Fermi level in a p - type material is expressed as
a. $E_v - KT \ln\left(\frac{N_v}{p_p}\right)$
b. $E_v + KT \ln \ln\left(\frac{N_v}{p_p}\right)$ *

c. $E_v - KT \ln\left(\frac{N_D}{P_n}\right)$

775. The V_T is expressed as

a. $\frac{KT}{q}$ * b. $\frac{q}{KT}$
c. qKT

776. The diffusion constant and the mobility of electron are related as

a. $\frac{D_n}{\mu_n} = \frac{KT}{q}$ *
b. $\frac{D_n}{\mu_n} = \frac{q}{KT}$
c. $\frac{D_n}{\mu_n} = qKT$

777. The diffusion constant and the mobility of electron and hole are related as

a. $\frac{D_n}{\mu_n} = \frac{KT}{q}$ *
b. $\frac{D_n}{\mu_n} = \frac{q}{KT} = \frac{\mu_p}{D_p}$
c. $\frac{D_n}{\mu_n} = qKT = \frac{\mu_p}{D_p}$

778. The diffusion current is influenced by

- a. concentration gradient *
b. electric field
c. electrostatic field

779. The drift plus diffusion current density of electron is expressed as

a. $J_n = qn\mu_n E + qD_n \frac{dn}{dx} \text{ Amp/m}^2$ *
b. $J_n = qn\mu_n E - qD_n \frac{dn}{dx} \text{ Amp/m}^2$
c. $J_{nE} - AqD_n = qn\mu_n \frac{dn}{dx} \text{ Amp/m}^2$

780. The drift plus diffusion current density of holes is expressed as

a. $J_n = qn\mu_n E + qD_n \frac{dn}{dx} \text{ Amp/m}^2$
b. $J_n = qn\mu_n E - qD_n \frac{dn}{dx} \text{ Amp/m}^2$ *
c. $J_n = qn\mu_n E - QqD_n \frac{dn}{dx} \text{ Amp/m}^2$

781. Electron population in silicon is not
a. zero in the forbidden band
b. zero in the conduction band at 0K
c. zero at the conduction band edge E_C
d. zero in the conduction band at room temperature *

Explanation :

d. The carrier concentration is zero in the forbidden band. At 0K, electrons are filled in the available states only upto the Fermi level, which lies below the conduction band edge (E_C) and hence the concentration is zero in the conduction band. Also from density-of-state function, the number of available states at the band edges is always zero. Hence, conduction electrons in the conduction band due to thermal generation from the valence band as well as due to dopants present in the silicon at all temperatures

782. The density of states function for holes is

- a. zero in the valence band edge (E_v) *
b. zero in the forbidden band edge
c. zero in the complete conduction band
d. zero in all bands other than the valence band

783. The Fermi - Dirac statistics is based on

- a. Electron and Photons
b. Photons and Protons
c. Electrons and Holes *
d. Gas molecules

Explanation :

Fermi - Dirac statistics are valid for particles which obey the Pauli exclusion principles i.e. the concept of finite limited occupancy of state applies

784. Semi-conductor in higher temperature

- a. Good conductor of electricity *
b. Bad conductor of electricity
c. Act as an insulator
d. None

785. The good conductor are:

- a. Porcelain b. Glass
c. Quartz d. None *

786. Tick out which is not matched:

- a. Copper b. Silver
c. Aluminium d. Glass *

787. The insulator are:

- a. Porcelain b. Glass
c. Quartz d. Silver *

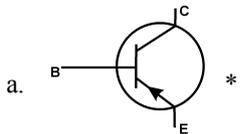
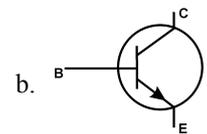
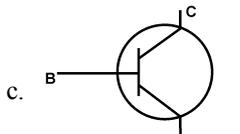
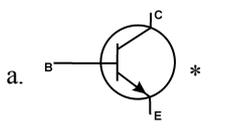
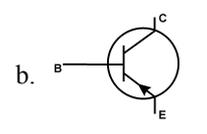
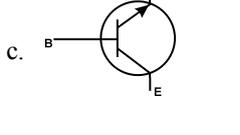
788. Insulator are:

- a. Good conductor of electricity
b. Bad conductor of electricity *
c. Both
d. None

789. Electricity wire used in house core made of:

- a. Copper b. Aluminium
c. Both * d. None
790. The core provides _____ path for flow of current:
a. an easy * b. a hard
c. Both d. None
791. Core is covered with:
a. Conducting material b. Insulator *
c. Both d. None
792. Covering of core provides protection against:
a. Open ckt b. Short ckt *
c. Both d. None
793. In short ckt (for ideal):
a. Current become $\frac{1}{2}$ * b. Voltage become $\frac{1}{2}$
c. Current = 0 d. None
794. In open ckt (for ideal case):
a. Current become $\frac{1}{2}$ b. Voltage become $\frac{1}{2}$
c. Both * d. None
795. Germanium are:
a. Good conductor b. Bad conductor
c. Both d. None *
796. Silicon are:
a. Good conductor b. Bad conductor
c. Both d. None *
797. Silicon and Germanium are:
a. Conducting material
b. Insulating material
c. Semiconductor material *
d. All
798. At room temperature Germanium and Silicon have conductivities _____ than that of conductor:
a. Lower * b. Higher
c. $\frac{1}{2}$ d. All
799. At room temperature Germanium and Silicon have conductivities _____ than that of insulator:
a. Lower b. Much Higher *
c. $\frac{1}{2}$ d. All
800. Semiconductor have:
a. +ve temperature coefficient
b. -ve temperature coefficient *
c. Both
d. None
801. When we raise the temperature of semiconductor its resistivity:
a. Increase b. Decrease *
c. Both d. None
802. By adding impurities the conductivity of semiconductor:
a. Increase * b. Decrease
c. No effect d. All
803. The diode is:
a. Unidirectional * b. Bidirectional
c. both d. None
804. Diode is used in rectifier ckt to convert:
a. AC to DC * b. DC to AC
c. AC to AC d. DC to DC
805. Transistor act as a:
a. Amplifier * b. Oscillator
c. Both d. None
806. Resistivity of copper in (in Ω m):
a. 1.7×10^{-8} * b. 1.6×10^{-8}
c. 2.6×10^{-8} d. None
807. The unit of resistivity:
a. Ω m* b. Ω /m
c. Both d. None
808. An atom consist of central body, known as:
a. Electron b. Proton
c. Nucleus * d. None
809. Proton and neutron have almost:
a. Same mass * b. Different mass
c. Not comparable d. None
810. Proton have:
a. +vely charged * b. -vely charged
c. Neutral d. None
811. Neutron have:
a. + vely charged * b. -vely charged
c. Electrically Neutral d. None
812. An electron is about 1850 time _____ than proton or neutron:
a. Heavier b. Lighter *
c. Both d. None
813. Electron and proton are same in number in nuclear:
a. The state is electrically neutral *
b. The state is electrically insulator
c. The state is electrically conductor
d. All
814. The number of proton in atom is called:
a. Atomic number * b. Atomic mass
c. Both d. None
815. The maximum number of electron that can exist in the first shell is:
a. Two * b. Three
c. Four d. Eight
816. Generally a shell can contain a maximum of electron:
a. $2n^2$ * b. $2n^2 + 1$
c. $2n^2 - 1$ d. $2n + 1$
where n = Number of the shell.

817. The electron present in outermost orbit are called:
 a. Valance electron *
 b. Valance proton
 c. Unbalanced electron
 d. Unbalanced proton
818. Atomic number of Silicon is:
 a. 14 * b. 32
 c. 15 d. 30
819. Nucleus contain 14 proton and 14 neutron in :
 a. Silicon * b. Germanium
 c. Gallon d. Carbon
820. Atomic number of Germanium is:
 a. 14 b. 32 *
 c. 30 d. 35
821. 'ev' in abbreviated as:
 a. Electron volt * b. Electron volume
 c. Electron valance d. All
822. 'ev' is unit of:
 a. Energy * b. Power
 c. Voltage d. Current
823. The unit of energy an electron volt is equivalent to:
 a. $1.6 \times 10^{-19} \text{ j} *$ b. $1.0 \times 10^{-19} \text{ j}$
 c. $2.6 \times 10^{-19} \text{ j}$ d. $6.1 \times 10^{-19} \text{ j}$
824. There is no forbidden gap b/w valance and conduction band:
 a. Metal * b. Insulator
 c. Semiconductor d. None
825. An insulating material have:
 a. No forbidden gap b. Wide forbidden gap *
 c. Both d. None
826. The forbidden gap in insulator:
 a. 5ev or more * b. Less than 5ev
 c. 2ev d. 1ev
827. Forbidden gap in semiconductor is:
 a. $\approx 1\text{ev} *$ b. 2ev
 c. Much high d. None
828. The purest form of semiconductor known as:
 a. Intrinsic semiconductor *
 b. Extrinsic semiconductor
 c. Both d. None
829. At absolute zero temperature semiconductor behave like:
 a. Insulator * b. Conductor
 c. No effect d. None
830. -ve temperature coefficient occurs in:
 a. Semiconductor * b. Conductor
 c. Insulator d. None
831. The process of deliberately adding impurities to a semiconductor material is called:
 a. Doping * b. Diffusion
 c. Drift d. None
832. A doped semiconductor is called:
 a. Intrinsic semiconductor
 b. Extrinsic semiconductor *
 c. Both
 d. None
833. In N-type semiconductor:
 a. Pentavalent impurity is added *
 b. Trivalent impurity is added
 c. Both
 d. None
834. The important property of diode conducts:
 a. Unidirectional * b. Bidirectional
 c. Both d. None
835. The diode is used in rectifier circuit to convert:
 a. DC to AC b. AC to DC *
 c. AC to AC d. None
836. Tick out, those are incorrect :-
 Conducting materials are:
 a. Copper b. Silver
 c. Aluminium d. Quartz *
837. Insulating materials are:
 a. Porcelain b. Glass *
 c. Bakelite d. Aluminium
838. Silicon and Germanium are:
 a. Good Conductor b. Good Insulator
 c. Semiconductor * d. None
839. Semiconductor materials have:
 a. +ve temperature coefficient
 b. -ve temperature coefficient *
 c. Both
 d. None
840. What will happen when the temperature increase of semiconductor:
 a. Resistivity increase b. Resistivity decrease *
 c. No effect d. Resistivity infinite
841. The number of protons in an atom is called:
 a. Atomic number * b. Atomic mass
 c. Both d. None
842. In general shell can contain maximum of electron:
 a. $2n^2 *$ b. $2n^2+1$
 c. $2n+1$ d. $2n^{1/2}$
 where 'n' is the number of shell.
843. The electron present in the outermost orbit are called:
 a. Valance electron * b. Valance Neutron
 c. Valance number d. None

844. Atomic number of Silicon is:
 a. 14 * b. 32
 c. 15 d. 12
845. Atomic number of Germanium is:
 a. 14 b. 32 *
 c. 15 d. 31
846. eV is abbreviated as:
 a. Electron volt * b. Electron value
 c. Electron valance d. None of these
847. eV is a unit of:
 a. Energy b. Voltage *
 c. Power d. Average power
848. eV is equivalent to:
 a. $1.6 \times 10^{-19} \text{ j}$ * b. $1.6 \times 10^{-10} \text{ j}$
 c. $.8 \times 10^{-19} \text{ j}$ d. $6 \times 10^{-10} \text{ j}$
849. There is no forbidden-energy gap b/w valance & conduction band is:
 a. Metal * b. Insulator
 c. Semiconductor d. All
850. Wide forbidden gap is:
 a. Metal b. Insulator *
 c. Semiconductor d. None
851. Semiconductor has forbidden gap:
 a. $\approx 5\text{ev}$ b. $\approx 1\text{ev}$ *
 c. $\approx 0\text{ev}$ d. None
852. Pure form of Semiconductor is:
 a. Intrinsic Semiconductor *
 b. Extrinsic Semiconductor
 c. Both
 d. None
853. A vacancy is created in the broken covalent bond, this vacancy is called:
 a. Electron b. Hole *
 c. Both d. None
854. The concentration of electron-hole pair is equal in:
 a. Extrinsic Semiconductor
 b. Intrinsic Semiconductor *
 c. Both
 d. None
855. Hole is:
 a. + vely charged * b. - vely charged
 c. Neutral d. All
856. When a flow of carrier due to an applied voltage, the current is:
 a. Drift current b. Diffusion current
 c. Conventional current*d. None
857. Flow as a result of a gradient of carrier concentration the current is:
 a. Drift current * b. Conventional current
 c. Diffusion current d. All
858. A doped Semiconductor material is called:
 a. Extrinsic Semiconductor *
 b. Intrinsic Semiconductor
 c. Both
 d. None
859. Pentavalent impurity is:
 a. Gallium b. Indium
 c. Phosphorus * d. Aluminium
860. Small amount of pentavalent impurity added:
 a. P-type Semiconductor
 b. N-type Semiconductor *
 c. Intrinsic Semiconductor
 d. All
861. N-type material has-large no. of electron & small no. of holes:
 a. True * b. False
862. Trivalent Impurity are not:
 a. Boron b. Aluminium
 c. Gallium d. Phosphorous *
863. Small amount of trivalent impurity is added:
 a. P-type *
 b. N-type
 c. Intrinsic Semiconductor
 d. All
864. The symbol of PNP Transistor is:
 a.  * b. 
 c.  d. None
865. The symbol of NPN Transistor is:
 a.  * b. 
 c.  d. None
866. A germanium atom contains:
 a. Four Protons
 b. Only two electron
 c. Four valance electron*
 d. Five valance electron

867. When atoms are held together by sharing of valence electron:
- They form a covalent bond *
 - The valence electrons are free to move away from the atom
 - Each atom becomes free to move
 - Each shared electron leaves a hole
868. An electron in the conduction band:
- Is bonded to its parent atom
 - Is located near the top of the crystal *
 - Has no charge
 - Has a higher energy than an electron in the valence band
869. An intrinsic semiconductor at the absolute zero of temperature:
- Behaves like an insulator *
 - Has a large number of holes
 - Has a few holes and same number of electrons
 - Behaves like a metallic conductor
870. When a voltage is applied to an intrinsic semiconductor which is at room temperature:
- Electron moves to the +ve terminal and holes move to the -ve terminal *
 - Holes move to the +ve terminal and electrons move to the -ve terminal
 - Both holes and electrons move to the +ve terminal
 - Both holes and electrons move to the -ve terminal
871. When the temperature of an intrinsic semiconductor is increased:
- Resistance of the semiconductor increases
 - Heat energy decreases the atomic radius
 - Holes are created in the conduction band
 - Energy of the atom is increased *
872. The movement of a hole is brought about by:
- The vacancy being filled by a free electron
 - The vacancy being filled by a valence electron from a neighboring atom *
 - The movement of the atomic core
 - The atomic core changing from a +4 to a +5 charge
873. If a small amount of antimony is added to germanium:
- The resistance is increased
 - The germanium will be P-type semiconductor
 - The antimony becomes an acceptor impurity
 - There will be more free electrons than holes in the semiconductor *
874. Donor type impurities:
- Create excess holes
 - Can be added to germanium but not to Silicon
 - Must have only five valence electrons *
 - Must have only three valence electrons
875. The conduction band:
- Is always located at the top of the crystal *
 - Is also called the forbidden energy gap
876. The forbidden energy gap in semiconductors:
- Lies just below the valence band
 - Lies just above the conduction band
 - Lies between the valence and the conduction band *
 - Is the same as the valence band
877. In the N-type semiconductor the concentration of minority carriers mainly depends upon:
- The doping technique
 - The number of donor atoms *
 - The temperature of the material
 - The quantity of the intrinsic material Ge or Si
878. If the amount of impurity either P-type or N-type added to the intrinsic is controlled to 1 part in one million the conductivity of the sample:
- Increases by a factor of 10^6 *
 - Increases by a factor of 10^3
 - Decreases by a factor of 10^{-3}
 - Is not affected at all
879. A semiconductor that is electrically neutral:
- Has no majority carrier
 - Has no free charges
 - Has no free carriers
 - Has equal amounts of +ve and -ve charges *
880. When a normal atom loses an electron the atom:
- Becomes a +ve ion *
 - Becomes a -ve ion
 - Becomes electrically neutral
 - Is then free to move about
881. Excess minority carriers are the minority carriers that:
- Are thermally generated
 - Are impurity generated *
 - Are in excess of the equilibrium number.
 - Are in excess of the number of majority carriers
882. The merging of a free electron and a hole is called recombination:
- True *
 - False
883. A pure germanium crystal is an intrinsic semiconductor and a doped crystal is an extrinsic semiconductor:
- True *
 - False
884. Conducting materials are:
- Good conductors of electricity *
 - Bad conductors of electricity
 - Act as insulators
 - None
885. The good conductors are:
- Porcelain
 - Glass
 - Quartz
 - None *

886. Tick out which is not matched:
 a. Copper b. Silver
 c. Aluminium d. Glass *
887. The insulator are:
 a. Porcelain b. Glass
 c. Quartz d. Silver *
888. Insulator are:
 a. Good conducting of electricity
 b. Bad conducting of electricity *
 c. Both
 d. None
889. Electrical wire used in house core made of:
 a. Copper b. Aluminium
 c. Both * d. None
890. The core provides _____ path for flow of current:
 a. an easy * b. a hard
 c. Both d. None
891. Core is covered with:
 a. Conducting material b. Insulator *
 c. Both d. None
892. Covering of core provides protection against:
 a. Open ckt b. Short ckt *
 c. Both d. None
893. In short ckt (for ideal):
 a. Current become ∞ * b. Voltage become ∞
 c. Current = 0 d. None
894. In open ckt (for ideal case):
 a. Current become ∞ b. Voltage become ∞
 c. Both * d. None
895. Germanium are:
 a. Good conductor b. Bad conductor
 c. Both d. None *
896. Silicon are:
 a. Good conductor b. Bad conductor
 c. Both d. None *
897. Silicon and Germanium are:
 a. Conducting material
 b. Insulating material
 c. Semiconductor material *
 d. All
898. At room temperature Germanium and Silicon have conductivities _____ than that of conductor:
 a. Lower * b. Higher
 c. ∞ d. All
899. At room temperature Germanium and Silicon have conductivities _____ than that of insulator:
 a. Lower b. Much Higher *
 c. ∞ d. All
900. Semiconductor have:
 a. +ve temperature coefficient
 b. -ve temperature coefficient *
 c. Both
 d. None
901. When we raise the temperature of semiconductor its resistivity:
 a. Increase b. Decrease *
 c. Both d. None
902. By adding impurities the conductivity of semiconductor:
 a. Increase * b. Decrease
 c. No effect d. All
903. The diode is:
 a. Unidirectional * b. Bidirectional
 c. both None
904. Diode is used in rectifier ckt to convert:
 a. AC to DC * b. DC to AC
 c. AC to AC d. DC to DC
905. Transistor is act as a:
 a. Amplifier * b. Oscillator
 c. Both d. None
906. Resistivity of copper in (in Ω m):
 a. 1.7×10^{-8} * b. 1.6×10^{-8}
 c. 2.6×10^{-8} d. None
907. The unit of resistivity:
 a. WM^* b. W/M
 c. Both d. None
908. An atom consist of central body known as:
 a. Electron b. Proton
 c. Nucleus * d. None
909. Proton and neutron have almost:
 a. Same mass * b. Different mass
 c. Not comparable d. None
910. Proton have:
 a. +vely charged * b. -vely charged
 c. Neutral d. None
911. Neutron have:
 a. + vely charged * b. -vely charged
 c. Electrically Neutral d. None
912. An electron is about 1850 time _____ than proton or neutron:
 a. Heavier b. Lighter *
 c. Both d. None
913. Electron and proton are same in number in nuclear:
 a. The state is electrically neutral *
 b. The state is electrically insulator

- c. The state is electrically conductor
d. All
914. The number of proton in atom is called:
a. Atomic number * b. Atomic mass
c. Both d. None
915. The maximum number of electron that can exist in the first shell is:
a. Two * b. Three
c. Four d. Eight
916. Generally a shell can contain a maximum of electron:
a. $2n^2$ * b. $2n^2 + 1$
c. $2n^2 - 1$ d. $2n + 1$
where n = Number of the shell.
917. The electron present in outermost orbit are called:
a. Valance electron * b. Valance proton
c. Unbalance electron d. Unbalance proton
918. Atomic number of Silicon is:
a. 14 * b. 32
c. 15 d. 30
919. Nucleus contain 14 proton and 14 neutron:
a. Silicon * b. Germanium
c. Gallium d. Carbon
920. Atomic number of Germanium is:
a. 14 b. 32 *
c. 30 d. 35
921. 'ev' in abbreviated as:
a. Electron volt * b. Electron volume
c. Electron valance d. All
922. 'ev' is unit of:
a. Energy * b. Power
c. Voltage d. Current
923. The unit of energy an electron volt is equivalent to:
a. $1.6 \times 10^{-19} \text{ j}$ * b. $1.0 \times 10^{-19} \text{ j}$
c. $2.6 \times 10^{-19} \text{ j}$ d. $6.1 \times 10^{-19} \text{ j}$
924. There is no forbidden gap b/w valance and conduction band:
a. Metal * b. Insulator
c. Semiconductor d. None
925. An insulating material have:
a. No forbidden gap b. Wide forbidden gap *
c. Both d. None
926. The forbidden gap in insulator:
a. 5ev or more * b. Less than 5ev
c. 2ev d. 1ev
927. Forbidden gap in semiconductor is:
a. $\approx 1\text{ev}$ * b. 2ev
c. Much high d. None
928. The purest form of semiconductor known as:
a. Intrinsic semiconductor *
b. Extrinsic semiconductor
c. Both
d. None
929. At absolute zero temperature semiconductor behave like:
a. Insulator * b. Conductor
c. No effect d. None
930. -ve temperature coefficient occurs in:
a. Semiconductor * b. Conductor
c. Insulator d. None
931. The process of deliberately adding impurities to a semiconductor material is called:
a. Doping * b. Diffusion
c. Drift d. None
932. A doped semiconductor is called:
a. Intrinsic semiconductor
b. Extrinsic semiconductor *
c. Both
d. None
933. In N-type semiconductor:
a. Pentavalent impurity is added *
b. Trivalent impurity is added
c. Both
d. None

CHAPTER - 15

KNOWLEDGE OF SYMBOLS, TRUTH TABLES AND EQUVALENT CIRCUITS FOR LOGIC GATES

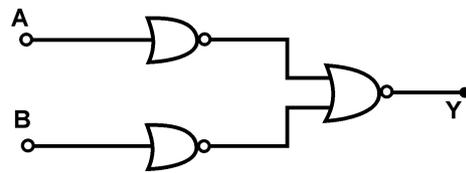
1. Decmial number 15 may be written in binary system as
 - a. 1110
 - b. 1111 *
 - c. 1100
 - d. 1001
2. Decimal number 74 may be written in binary system as
 - a. 1001010 *
 - b. 1001001
 - c. 1001011
 - d. 100011
3. Decimal number 21.125 may be written in binary system as
 - a. 10101.001 *
 - b. 10100.001
 - c. 10101.010
 - d. 10100.100
4. Decimal equivalent of binary number 1111.01 is
 - a. 14.25
 - b. 15.25 *
 - c. 15.01
 - d. 7.25
5. Decmical equivalent of binary number 0.1011 is
 - a. 0.6875 *
 - b. 6.875
 - c. 0.4375
 - d. -0.6875
6. Radix of octal number system is
 - a. 2
 - b. 4
 - c. 8 *
 - d. 10
7. Decimal equivalent of octal number 57 is
 - a. 47 *
 - b. 65
 - c. 54
 - d. 50
8. Octal equivalent of decimal number 49 is
 - a. 61 *
 - b. 59
 - c. 47
 - d. 53
9. Maximum number of binary bits required to represent a digit of octal number is
 - a. 2
 - b. 3 *
 - c. 4
 - d. 5
10. Octal equivalent of decimal $(51)_{10}$ is
 - a. $(63)_8$ *
 - b. $(41)_8$
 - c. $(67)_8$
 - d. $(27)_8$
11. BCD equivalent of decimal number $(85)_{10}$ is
 - a. 1000-1100
 - b. 1000-0101 *
 - c. 1101-1010
 - d. 1101-0101
12. BCD equivalent of decimal number $(43)_{10}$ is
 - a. 101-011
 - b. 1000-0011
 - c. 0100-0011 *
 - d. 0011-0100
13. Excess-3 code is also known as
 - a. weighted code
 - b. cyclic redundany code
 - c. self complementing code *
 - d. algebraic code
14. Which of the following codes is an unweighted code ?
 - a. 8421 code
 - b. Excess - 3 code *
 - c. 2421 code
 - d. 63210 code
15. Which of the following codes is a weighted code ?
 - a. Excess - 3 code
 - b. shift - counter code
 - c. gray code
 - d. 5111 code *
16. Excess - 3 equivalent of decimal number $(8)_{10}$ is
 - a. 1011 *
 - b. 1101
 - c. 1110
 - d. 1001
17. The gray code equivalent of binary number $(1000001)_2$ is
 - a. 1100001 *
 - b. 1100011
 - c. 1000011
 - d. 110101
18. Decimal number $(85)_{10}$ is encoded as 1100-0101 in
 - a. 8421 code
 - b. 4421 code *
 - c. 2421 code
 - d. 2221 code
19. Binary equivalent of gray code number 101 is
 - a. 101
 - b. 110 *
 - c. 100
 - d. 111
20. Number of binary bits required to represent a hexadecimal digit is
 - a. 3
 - b. 4 *
 - c. 5
 - d. 6
21. Hexadecimal equivalent of decimal number 1000 is
 - a. 3 E S *
 - b. 4 E S
 - c. 3 C E
 - d. 3 E 7
22. Binary subtraction 1111-111 will yield
 - a. 1100
 - b. 1000 *
 - c. 1001
 - d. 1010
23. Binary addition 1001 + 1101 yields
 - a. 11100
 - b. 11010
 - c. 10110 *
 - d. 11000
24. One's compliment of 010001 is
 - a. 101110 *
 - b. 101111
 - c. 01110
 - d. 011110
25. The 2's compliment of binary number 0.01011 is
 - a. 1.10101 *
 - b. 0.10101
 - c. 0.10100
 - d. 1.10100

26. ASC-II code is used as
 a. as alphabetic code b. a cyclic code
 c. a weighted code d. an alphanumeric code *
27. ASC-II code is
 a. a 4-bit code b. a 6-bit code
 c. a 7-bit code * d. none of these
28. Binary division 10010.1011×11.01 yields
 a. 110.11 b. 100.11
 c. 101.10 d. 101.11 *
29. A six-bit alphanumeric code is able to code
 a. 36 characters b. 48 characters
 c. 64 characters * d. 128 characters
30. Number 17 in BCD representation is
 a. 10001 b. 001 111 *
 c. 10111 d. 10001
31. Cyclic codes are useful in
 a. arithmetic computation
 b. continuously varying digital signals representation *
 c. randomly varying digital signals representation
 d. transferring the information
32. BCD equivalent of Gray code number 1001 is
 a. 1001 b. 1110 *
 c. 1100 d. 1101
33. Hexadecimal equivalent of decimal number 15 is
 a. 100 A b. OF *
 c. 1111 d. 0101
34. Decimal equivalent of hexadecimal number 11 A is
 a. 282 * b. 272
 c. 200 d. 202
35. Octal equivalent of binary number 01000100111 is
 a. 4236 b. 2117 *
 c. 1084 d. 41.836
36. Hexadecimal equivalent of binary number 10001101011001 is
 a. 2359 * b. 9493
 c. 8D62 d. 8DF2
37. Binary 1000 when multiplied by binary 1111 results in binary
 a. 1111111 b. 1111100
 c. 1111000 * d. 1110000
38. Byte signified
 a. an integrated circuit b. a string of 2 bits
 c. a string of 4 bits d. a string of 8 bits *
39. 1 k-byte is precisely equal to
 a. 1012 bits b. 1024 bits *
 c. 1000 bits d. 1020bits
40. Hexadecimal number system is
 a. an absolute system no longer in use *
 b. widely used in analysing and programming microprocessor
 c. used in calculators only
 d. none of these
41. Hexadecimal system uses digits from
 a. 1 to 16 b. 1 to 9
 c. 1 to 6 d. 0 to 9 *
42. Main advantage of hexadecimal number system is
 a. ease of conversion from hexadecimal to decimal and vice-versa
 b. ease of conversion from hexadecimal to binary and vice-versa *
 c. ease of conversion from hexadecimal to gray code and vice-versa
 d. use of number and alphabets
43. Binary coded decimal (BCD) numbers express each decimal
 a. unit b. bit
 c. byte d. nibble *
44. BCD numbers are useful whenever
 a. binary to BCD conversion is desired
 b. binary to hexadecimal conversion is desired
 c. decimal information is transferred into or out of digital system *
 d. none of these
45. The equipment uses BCD numbers is
 a. pocket calculator b. electronic counter
 c. digital voltmeter d. all of the above *
46. How many bytes are there in binary number 1011 1001 0110 1110 ?
 a. 1 b. 2 *
 c. 3 d. 4
47. What does 4-k represent ?
 a. 4000 b. 4048
 c. 4182 d. 4096 *
48. Which of the following hexadecimal number just prior to F 52B ?
 a. E 52A b. F 51B
 c. F 52 A * d. 5 F2B
49. Which of the following hexadecimal numbers represents an odd decimal number ?
 a. FF * b. EG
 c. CC d. AA
50. Which of the following hexadecimal numbers represents an even decimal number ?
 a. DB b. D5
 c. BF d. AC *

51. $\overline{A+B+C} = D$ represents a
 a. NOR gate b. NAND gate *
 c. EX-OR gate d. AND gate
52. $\overline{A.B.C} = D$ represents a
 a. NOR gate * b. NAND gate
 c. EX-OR gate d. AND gate
53. Output of which of the following gates is 1 only if at least one of its inputs is 0 ?
 a. NOR gate b. NAND gate *
 c. EX-OR gate d. AND gate
54. Output of which of the following gates is 0 only if at least one of its inputs is 1 ?
 a. NOR gate * b. NAND gate
 c. EX-OR gate d. AND gate
55. $\overline{AB} = Y$ is the Boolean expression for
 a. OR gate b. NOR gate
 c. NAND gate * d. EX-OR gate
56. $\overline{A+B} = Y$ is the Boolean expression for
 a. AND gate b. NAND gate
 c. NOR gate * d. NOR
57. Which gate has the output low only when both inputs are high ?
 a. AND b. NAND *
 c. OR d. NOR
58. NOR gate is logically equivalent to
 a. an OR gate followed by an AND gate
 b. an OR gate followed by a NAND gate
 c. an AND gate followed by OR gate
 d. an OR gate followed by an inverter *
59. A NAND gate is equivalent to
 a. an AND gate followed by a OR gate
 b. an AND gate followed by an inverter *
 c. an inverter followed by OR gate
 d. an inverter followed by an AND gate
60. NAND gate is called a universal gate because
 a. it is most commonly used
 b. all logical functions can be realized by use of NAND gates alone *
 c. all minimization techniques can be applied to it
 d. it can realise AND and NOT functions
61. $\overline{AB} + \overline{AB} = D$ represents
 a. an Or gate b. an EX-OR gate *
 c. a NOR gate d. a NAND gate
62. Complementary function is represented by
 a. NOR gate b. NOT gate *
 c. NAND gate d. EX-OR gate

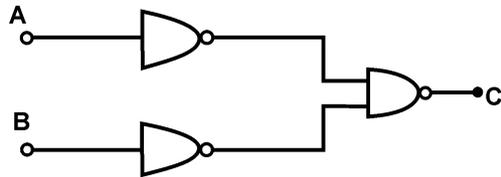
63. Boolean expression for three input AND gate
 a. $A.B.C = D$ * b. $A+B+C = D$
 c. $\overline{A.B.C} = D$ d. $\overline{A+B+C} = D$
64. Boolean expression for three input OR gate is
 a. $\overline{A+B+C} = D$ b. $A+B+C = D$ *
 c. $A.B.C = D$ d. $\overline{A.B.C} = D$

65. The circuit given below is functionally equivalent to



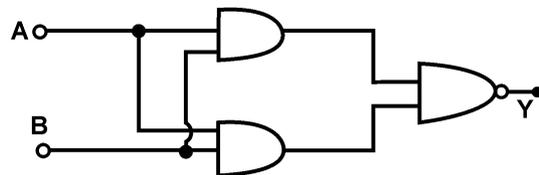
- a. OR gate b. NOR gate
 c. AND gate * d. NAND gate

66. The circuit given below is functionally equivalent to



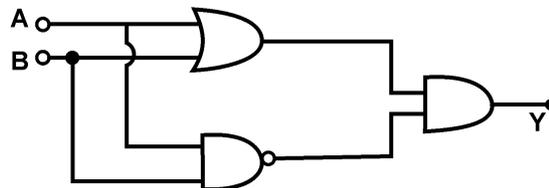
- a. OR gate * b. NOR gate
 c. AND gate d. NAND gate

67. The circuit given below is functionally equivalent to



- a. EX-OR gate b. comparator *
 c. inhibit gate d. NAND gate

68. The circuit given below is functionally equivalent to



- a. EX-OR gate * b. NOR gate
 c. AND gate d. NAND gate

69. Half-adder is also known as
 a. AND circuit b. NAND circuit
 c. NOR circuit d. EX-Or circuit *

70. Which of the following Boolean algebra rules is correct ?
 a. $A.\overline{A} = 1$ b. $A + A.B = A + B$

- a. NOT b. AND
c. OR d. NAND *
86. In which of the following gates the output is 0 if and only if at least one inputs is 1 ?
a. NOT b. AND
c. NOR * d. NAND
87. For which of the following logic gates, the output is complement of the input ?
a. NOT * b. AND
c. OR d. XOR
88. Let A and B be the inputs to a NAND gate. Then the output is equal to
a. $A + B$ b. $A \cdot B$ *
c. $\overline{A \cdot B}$ d. $\overline{A \cdot B}$
89. Let A and B be the inputs to a XOR gate. Then the output is given by
a. $A + B$ b. $A \cdot B$
c. $\overline{A \cdot B}$ d. $\overline{A \cdot B} + A \cdot \overline{B}$ *
90. The NAND gate can function as a NOT gate if
a. inputs are connected together *
b. inputs are left open
c. one input is set to 0
d. one input is set to 1
91. What is the minimum number of two input NAND gates used to perform the function of two - input OR gate ?
a. one b. two
c. three * d. four
92. Which of the following gates are added to the inputs of the OR gate to convert it into NAND gate ?
a. NOT * b. AND
c. OR d. XOR
93. Which logic function is produced by adding inverters to the inputs of an AND gates ?
a. NAND b. NOR *
c. XOR d. OR
94. Which logic function is produced by adding an inverter to each input and the output of an AND gate ?
a. NAND b. NOR
c. OR * d. XOR
95. Which of the following gates is known as "coincidence detector" ?
a. AND * b. OR
c. NOT d. NAND
96. An AND gate may be visualised as
a. switches connected in series *
b. switches connected in parallel
c. MOS transistor connected in series
d. none of these
97. An OR gate may be imagined as
a. switches connected in series
b. switches connected in parallel *
c. MOS transistor connected in series
d. none of the above
98. Which of the following gates would have output 1 when one input is 1 and the other input is 0 ?
a. OR b. AND
c. NAND d. both (a) and (c) above *
99. Which gate is formed by adding an inverter at the output of an OR gate ?
a. NOR * b. XOR
c. EQUIVALENCE d. NAND
100. What is minimum number of NAND gates needed to perform the logic function $A \cdot B$?
a. 1 b. 2 *
c. 3 d. 4
101. Which of the following is functionally a complete set ?
a. AND, OR b. AND, XOR
c. NOT, OR d. AND, OR, NOT *
102. Which of the following is not true ?
a. $0 + A = A$ * b. $1 + A = 1$
c. $A + A = A$ d. $1 \cdot A = 1$
103. Reduced form of Boolean expression $(A + B)(A + C)$ is
a. $AB + AC$ * b. $A + B + C$
c. $AC + B$ d. $A + BC$
104. Reduced form of Boolean expression $\overline{A} \overline{B} + \overline{A} B + AB$ is
a. $A + \overline{B}$ b. $\overline{A} + B$
c. A * d. $A + B$
105. Which of the following logic expressions is wrong ?
a. $1 \oplus 0 = 1$ b. $1 \oplus 1 = 0$
c. $1 \oplus 0 \oplus 1 = 1$ * d. $1 \oplus 1 \oplus 1 = 1$
106. Simplified form of Boolean expression $(A + B + AB)(A + C)$ is
a. $A + B + C$ * b. $AB + BC$
c. $A + BC$ d. $AC + B$
107. Simplified form of Boolean expression $(A + \overline{B} + C)(A + \overline{B} + \overline{C})(A + B + C)$ is
a. $\overline{A} B + \overline{C}$ b. $A + \overline{B} C$
c. A * d. $AB + \overline{C}$
108. Complement of Boolean expression $A(B + C)(\overline{C} + \overline{D})$ is
a. $\overline{A} + \overline{B} \overline{C} + CD$ b. $A + BC + \overline{C} \overline{D}$ *
c. $A(B + C)(C + D)$ d. $(\overline{C} + \overline{D})(B + A) CA$

132. The radix for hexadecimal system is
 a. 1 b. $\log_e 6$
 c. 6 d. 8^*
133. Which of the following binary addition is incorrect ?
 a. $0+0=0$ b. $0+1=1$
 c. $1+0=1$ d. $1+1=0^*$
134. The binary sum of 111010_2 and 11011_2 is
 a. 1010101_2^* b. 1010111_2
 c. 1011111_2 d. 1111111_2
135. A pure sine wave is
 a. a digital signal
 b. a digital signal at higher frequencies
 c. an analog signal *
 d. neither digital nor analog signal
136. Which of the following can provide a digital signal ?
 a. A cosine wave
 b. Slow turning of a potentiometer
 c. Variable resistor
 d. A square wave *
137. The number of levels in a digital signal is
 a. One b. Two *
 c. Always odd d. Ten
138. Decimal 1 in binary system can be written as
 a. 1000 b. 0100
 c. 0010 d. 0001 *
139. Binary 111 represents
 a. decimal 222 b. decimal 8
 c. decimal 7 * d. decimal 4
140. Binary 1111 represents
 a. decimal 2222 d. decimal 100
 c. decimal 25 d. decimal 15 *
141. Find the odd one out
 a. 1111_2 b. 1101_2
 c. 1011_2 d. 1010_2^*
142. Byte is
 a. a piece of hardware used in number system is
 b. a string of two bits
 c. an integrated circuit
 d. a string of 8 bits *
143. Chunking is
 a. replacing a longer string by a shorter one *
 b. an integrated circuit
 c. a magnetic device used in a computer
 d. a group of digits
144. The radix of hexadecimal system is
 a. 1 b. 6
 c. 16^* d. 64
145. Nibble is
 a. a string of 4 bits * b. a string of 8 bits
 c. a string of 16 bits d. a string of 64 bits
146. If decimal 10 in binary is 1010, then decimal 100 in binary will be
 a. 1000100 b. 1100100 *
 c. 1110100 d. 1111111
147. Binary 111111 represents
 a. decimal 99 b. decimal 87
 c. decimal 63 * d. decimal 51
148. Binary 1111 when added to binary 1111 the result is decimal
 a. 10000 b. 10010
 c. 10110 d. 11110 *
149. Binary 11111 when added to binary 11111, the result will be binary
 a. 100010 b. 100110
 c. 101110 * d. 111110
150. Binary 1000 when subtracted from binary 1111, the result will be binary
 a. 111 * b. 1110
 c. 1010 d. 1000
151. Binary 1111 when subtracted from binary 11111, the result will be binary
 a. 1000 b. 10000 *
 c. 11111 d. 1111
152. Binary 1000 when multiplied by binary 1111, the result will be binary
 a. 1111111 b. 1111100
 c. 1111000 * d. 1110000
153. Binary 1000 multiplied by binary 1000 gives
 a. 10000 b. 100000
 c. 1000000 * d. 10000000
154. Which of the following binary relation is invalid ?
 a. $0 \times 0 = 0$ b. $1 + 1 = 10$
 c. $1 \times 1 = 1$ d. $0, 1 = 1^*$
155. Decimal 0.875 is represented in binary system by
 a. .0101 b. 0.0111
 c. 0.111 * d. 0.001
156. Decimal 10.75 is represented in binary system by
 a. 10.1010 b. 101.1110
 c. 111.1111 d. 1010.11 *
157. Binary 1111.1111 is equivalent to decimal
 a. 15.9375 * b. 10.9375
 c. 10.8750 d. 15.96875
158. Precisely 1 k byte means
 a. 1000 bits b. 1012 bits
 c. 1020 bits d. 1024 bits *

159. The hexadecimal number system is
 a. widely used in analyzing and programming microprocessors *
 b. an obsolete system no more in use
 c. used on calculators only
 d. none of the above
160. The hexadecimal digits are
 a. 1 to 16 b. 1 to 9
 c. 0 to 9 * f. 1 to 6
161. The hexadecimal alphabets are from
 a. A to N b. A to L
 c. A to J d. A to F *
162. The main advantage of hexadecimal numbers is
 a. ease of conversion from hexadecimal to binary and vice versa *
 b. ease of conversion from hexadecimal to decimal and vice versa
 c. ease of conversion from grey code to binary and vice versa
 d. the use of numbers and alphabets
163. Binary 11.101 is equivalent to decimal
 a. 3.625 * b. 5.450
 c. 4.500 d. 4.625
164. Which of the following binary number is equal to decimal number 127?
 a. 1001100 b. 1010100
 c. 1111111 * d. 1000000
165. Binary number 11010101 is equal to decimal number
 a. 177 b. 189
 c. 197 d. 213 *
166. Which of the following binary addition is incorrect?
 a. 1000+0110=1111 b. 11111+10001=110000
 c. 11111+10000=1111111*d. 11111+1111=101110
167. Binary 1000 will be the result of which of the following subtraction in binary system?
 a. 1111 - 111 * b. 1010 - 101
 c. 1011 - 1110 d. 11111 - 1110
168. Binary - coded - decimal (BCD) numbers express each decimal digit as a
 a. unit b. bit
 c. byte d. nibble *
169. BCD numbers are useful whenever
 a. binary to hexadecimal conversion is desired
 b. binary to BCD conversion is desired
 c. decimal information is transferred into or out of a digital system *
 d. none of the above
170. Equipment using BCD numbers
 a. pocket calculators b. electronic counters
 c. digital voltmeters d. all of the above *

171. The ASC II code is a
 a. 5-bit code b. 7-bit code *
 c. 9-bit code d. 11 - bit code
172. How many bytes are there in 1011 1001 0110 1110
 a. 1 b. 2 *
 c. 2½ d. 3
173. How many bytes are there in 1111 1011 0111 0100 1010?
 a. 2 b. 2½ *
 c. 3 d. 3½
174. What does 4 K represent?
 a. 4000 b. 4048
 c. 4096 * d. 4182
175. 8.192 expressed in K units will be
 a. 8 K * b. 10 K
 c. 81 K d. 8192 K

Question 176 to 178 refer to fig. 1

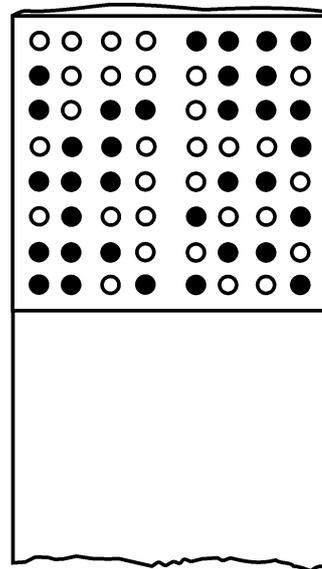


Fig. 1.

- Fig. 1. shows a strip of magnetic tape. The black circles are magnetized points and the white circles unmagnetized points. The magnetized points represent binary 1.
176. What binary number does second row represent?
 a. 01111001 b. 01010101
 c. 10101010 d. 10000110 *
177. What is the decimal equivalent of the binary number shown in fourth row?
 a. 79 b. 97 *
 c. 117 d. 127
178. Which two rows represent identical binary numbers?
 a. second and fourth b. fifth and eighth
 c. third and seventh d. fifth and seventh *
179. Which row represents the binary number which is equivalent to decimal number 183?
 a. Second b. Third *

- a. 1C6A b. 1D7B *
 - c. 1D6A d. 1E5B
197. Decimal number 15.359 when expressed in hexadecimal numbers becomes
- a. 3BCD b. 3CDE
 - c. 3BFF * d. 3FE6
198. Decimal number 42.285 when expressed in hexadecimal numbers becomes
- a. BCDE b. BBBB
 - c. B7A6 d. B8B5 *

Question 199 to 201 refer to fig. 2



Fig. 2.

199. Fig. 2 shows an 8-bit LED display. A light circle means that a LED is on (binary 1) and a dark circle means a LED is off (binary 0). The binary number being displayed is
- a. 01010011 b. 10101110
 - c. 11001101 d. 10101100 *
200. The decimal equivalent of the number displayed is
- a. 128 b. 156
 - c. 172 * d. 212
201. Equation $x_{10} = 11001002_2$ when solved for x gives the value of x as
- a. 8 b. 111
 - c. 152 d. 201 *

Question 202 to 203 refer to fig. 3.

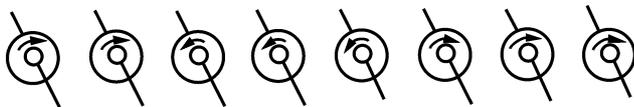


Fig. 3.

202. What is the binary number stored in the 8-bit core register ?
- a. 1010 1010 b. 1100 0111 *
 - c. 1110 0101 d. 1011 1111
203. The decimal equivalent of the number represented is
- a. 232 b. 212
 - c. 199 * d. 152
204. A 8-bit transistor stores decimal 150. What will be the binary out-put of the register ?
- a. 1000 1000 b. 1111 0000
 - c. 1111 1111 d. 1001 0110 *

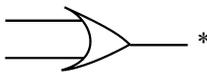
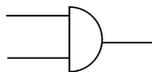
205. A hexadecimal odometer display F52F. The next reading will be
- a. E 52 F b. E 52 E
 - c. E 53 F d. E 53 O *
206. Which of the following will be a hexadecimal number just prior to F 52 B ?
- a. E 51 A b. F 51 B
 - c. E52 B d. F 52 A *
207. Which of the following hexadecimal number is not in the correct sequence ?
- a. F 52 E b. F 52 F
 - c. E 53 O d. F 53 C *
208. Which of the following hexadecimal number represents an odd number ?
- a. FF * b. EG
 - c. CC d. AA
209. The hexadecimal number given below represent decimal numbers which are multiples of DC, C8, BE, 46, 1E
- a. 2 b. 6
 - c. 7 d. 10 *
210. Which of the following hexadecimal number is not in the right order ?
- a. 32 b. 64
 - c. 96 d. CA *
211. Which hexadecimal number represents even decimal number ?
- a. DB b. D5
 - c. BF d. AC *
212. Which of the following hexadecimal to decimal conversion is incorrect ?
- a. $FF_{16} = 255_{10}$ b. $C8_{16} = 210$
 - c. $4E_{16} = 78$ d. $2F_{16} = 47 *$
213. What is octal equivalent of decimal 67 ?
- a. 53 b. 67
 - c. 103 * d. 153
214. What is the octal equivalent of decimal 0.6 ?
- a. 0.46314631 * b. 0.2327272
 - c. 0.3333333 d. 0.46464646
215. What is the binary equivalent of octal 47 ?
- a. 101010 b. 100111 *
 - c. 100100 d. 111001
216. What is the hexadecimal equivalent of octal 73 ?
- a. 3E b. 3D
 - c. 3C d. 3B *
217. Match the following
- | | |
|---|---|
| <p>Column I
(Hexadecimal)</p> <p>a. 68</p> | <p>Column II
(Octal)</p> <p>i. 150</p> |
|---|---|

- c. 11110000 iii. 360
- d. 10010010 iv. 252
- a. a - ii b -iv, c - i, d - iii
- b. a - iii, b - i, c - ii, d -iv
- c. a - iii, b - i, c - iv, d - ii
- d. a - iv, b - i, c - iii, d - ii *

228. Match the following

- | | |
|--|-----------------------------------|
| Column I
(Octal) | Column II
(Hexadecimal) |
| a. 66 | i. 3F |
| b. 77 | ii. 36 |
| c. 55 | iii. 27 |
| d. 47 | iv. 2D |
| a. a - i b -iii, c - ii, d - iv | |
| b. a - ii, b - i, c - iv, d -iii * | |
| c. a - iii, b - i, c - ii, d - iv | |
| d. a - iv, b - i, c - ii, d - iii | |

229. Symbol of OR Gate is:

- a.  * b. 
- c.  d. None

230.  This symbol represents:

- a. OR b. NOR *
- c. NAND d. None

231.  x will equal to:

- a. A+B * b. AB
- c. A-B d. All

232. If A=0 and B=1, x will:

- a. 1 * b. 0
- c. Both d. None

233. If A=1 & B=1, the o/p of OR will be:

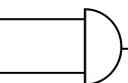
- a. 1 * b. 0
- c. Both d. None

234. If A=0 and B=0, the o/p of OR will be:

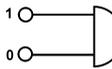
- a. 1 b. 0 *
- c. Both d. None

235. If A=1 and B=0, the o/p of OR will be:

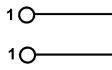
- a. 1 * b. 0
- c. Both d. None

236.  The symbol represents:

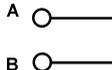
- a. AND * b. OR
- c. NAND d. None

237.  x will be:

- a. 0 * b. 1
- c. Both d. None

238.  x will be:

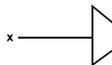
- a. 1 * b. 0
- c. Both d. None

239.  x will be:

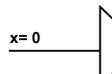
- a. $x = a \cdot b$ * b. $x = a + b$
- c. $x = a/b$ d. None

240.  The 'y' will be:

- a. x^1 * b. x
- c. 0 d. All

241.  The ckt represent:

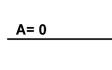
- a. NOT * b. OR
- c. NAND d. None

242.  The 'y' will be:

- a. $y = 1$ * b. $y = 0$
- c. Both d. None

243.  Symbol represent:

- a. AND b. NOT
- c. BUFFER * d. None

244.  The 'x' will be:

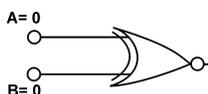
- a. $x = 0$ b. $x = 1$ *
- c. Both d. None

245.  The 'x' will be:

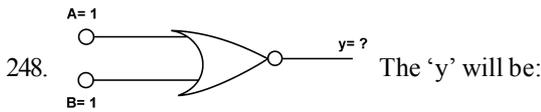
- a. $\overline{A + B}$ * b. $\overline{\overline{A + B}}$
- c. A + B d. None

246. $\overline{\overline{A + B}} = ?$

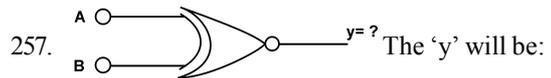
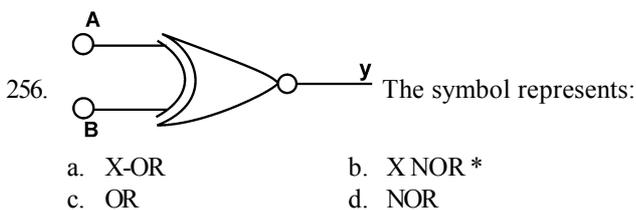
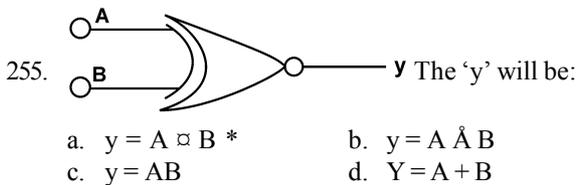
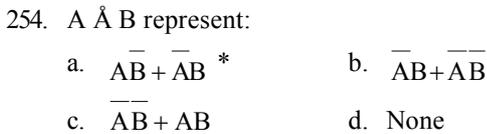
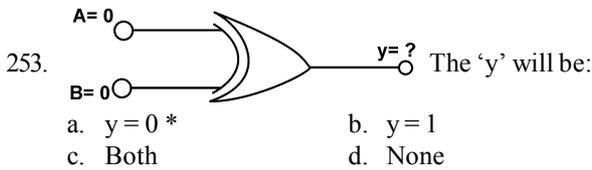
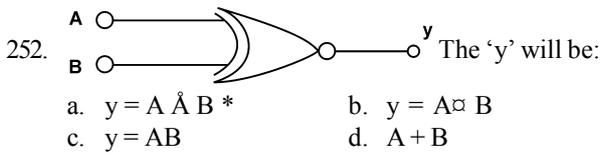
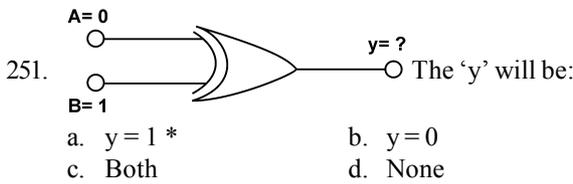
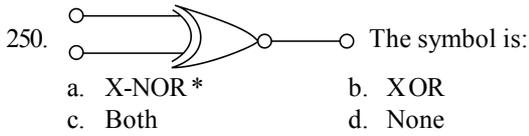
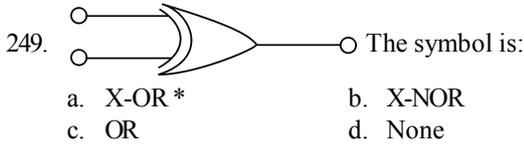
- a. $\overline{\overline{A + B}}$ * b. $\overline{\overline{A + B}}$
- c. AB d. None

247.  The 'y' will be:

- a. $y = 1$ *
- b. $y = 0$
- c. $y =$
- d. None



- a. $y = 0$ *
- b. $y = 1$
- c. Both
- d. None



- a. $y = AB + \overline{AB}$ *
- b. $y = \overline{AB} + AB$
- c. $y = \overline{AB} + AB$
- d. None

258. If both I/p are same the o/p of X-OR gate will be:

- a. 0 *
- b. 1
- c. Both
- d. None

259. If I/p are different the o/p of X-OR gate will be:

- a. 1 *
- b. 0
- c. Both
- d. None

260.

I/P	O/P
0	0
1	1

 The truth table is of:

- a. BUFFER *
- b. NOT
- c. OR
- d. AND

261. The truth table is of

I/P	O/P	
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

- a. OR *
- b. NOR
- c. AND
- d. XOR

262. The truth table is of

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

- a. OR
- b. NOR
- c. AND *
- d. NAND

263. The truth table is of

I/P	O/P
0	1
1	0

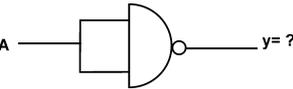
- a. BUFFER
- b. NOT *
- c. AND
- d. NAND

I/P		O/P
A	B	Y
0	0	0
0	1	1
1	1	0
1	0	1

264. The truth table is of

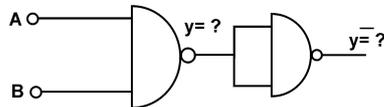
- a. OR
- b. NOR
- c. X-OR *
- d. None

265. The 'y' will be



- a. $y = \overline{A}$ *
- b. $y = A$
- c. $y = 0$
- d. $y = 1$

266. (a) The o/p y is

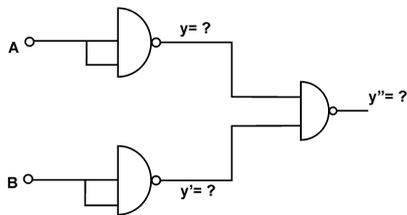


- a. $y = \overline{AB}$
- b. $y = \overline{A + B}$
- c. Both
- d. None

(b) The o/p y' will be:

- a. $y = AB$
- b. $y = \overline{AB}$
- c. Both
- d. None

267.



The o/p y is

- a. $y = \overline{A}$ *
- b. $y = \overline{\overline{A}}$
- c. $y = A$
- d. None

268. The o/p y' will be

- a. $y' = \overline{B}$ *
- b. $y' = \overline{\overline{B}}$
- c. $y' = B$
- d. None

269. The o/p of y'' will be

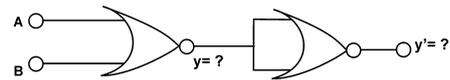
- a. $y'' = 0$
- b. $y'' = 1$
- c. $y'' = A + B$ *
- d. $y'' = AB$

270. The o/p of y will be:



- a. $y = A'$ *
- b. $y = A$
- c. $y = 0$
- d. $y = 1$

271. The o/p of y will be:

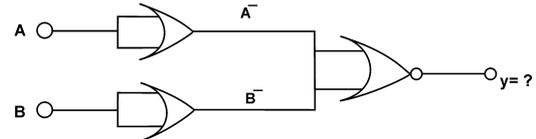


- a. $y = \overline{A + B}$ *
- b. $y = A + B$
- c. $y = \overline{AB}$
- d. $y = AB$

272. The o/p of y' will be:

- a. $y' = A + B$ *
- b. $y' = \overline{A + B}$
- c. $y' = \overline{A} \overline{B}$
- d. $y' = A \overline{B}$

273. The o/p of y will be



- a. $y = \overline{\overline{A + B}}$
- b. $y = \overline{\overline{A} \cdot \overline{B}}$
- c. $y = AB$
- d. $y = \text{All} *$

274. According to Boolem Algebra:

- $A + 0 = ?$
- a. A *
- b. 0
- c. 1
- d. None

275. A . A will be:

- a. A^2
- b. A *
- c. Both
- d. None

276. $A + 1$ will be:

- a. 1 *
- b. 0
- c. A
- d. None

277. $A + BC$ will be:

- a. $(A + B)(A + C)$ *
- b. $(A + B)C$
- c. $(A + C)B$
- d. None

278. $A + AB$ will be

- a. $(A+A)(A+B)$
- b. $A(A+B)$
- c. A
- d. All *

279. The base of any number system is equal to

- a. number of digits in that system *
- b. one digit less than the number of digits in that system
- c. one digit more than the number of digits in that system

280. The largest value of digit in any number system is

- a. equal to base of that system
- b. one less than the base of that system *
- c. one more than the base of that system

281. The number of digits in the Octal number system are

- a. 4
- b. 8 *
- c. 7
- d. 6

282. Sixteen digits are used in

- a. binary system

- b. duo decimal system
c. octal system
d. hexadecimal system *
283. A nibble contains
a. 2 - bits
b. 4 - bits *
c. 6 - bits
d. 8 - bits
284. A byte contains
a. 2 - bits
b. 4 - bits
c. 6 - bits
d. 8 - bits *
e. 16 - bits
285. The binary equivalent of 26.53125_{10} is
a. 11010.1100
b. 11010.10001 *
c. 11011.10001
d. 11010.10001
286. Decimal equivalent of 32_8 is
a. 36
b. 26 *
c. 16
d. 32
287. Sum of 32_8 and $A8_8$ is
a. D10
b. CA
c. DA *
d. DC
288. Decimal equivalent of 32_{16} is
a. 50 *
b. 32
c. 36
d. 35
289. The sum of $207A_{16}$ and 8184_{16} is
a. A2FE
b. A1FF
c. A1FE *
d. A1EF
290. One of the binary digit is called a
a. bit *
b. nibble
c. byte
291. The sign bit in 2's complement is represented by the
a. LSB
b. MSB. *
292. The binary equivalent of -35_{10} with minimum number of bits is
a. 11011101
b. 1011101 *
c. 1001110
d. 1011111
293. 1's complement of 0100011 is
a. 1011101
b. 1011100 *
c. 1011110
d. 1011111
294. 2's complement of 0100011 is
a. 1011101 *
b. 1011100
c. 1011110
d. 1011111
295. The decimal number 243 is represented in natural BCD form as
a. 1110011
b. 001001000011 *
c. 000001110011
d. 111001100000
296. Subtraction in digital computer is performed
a. similar to decimal number
b. by 2's complement method *
c. by 9's complement method
d. by 10's complement method
297. The maximum positive or negative number in 2's complement representation is
a. $+(2^{n-1} - 1), -(2^{n-1} - 1)$
b. $(2^{n-1} - 1), -(2^{n-1}) *$
c. $2^{n-1}, -2^{n-1}$
d. $2^{n-1}, -(2^{n-1} - 1)$
298. The maximum positive or negative number in 1's complement representation is
a. $+(2^{n-1} - 1), -(2^{n-1} - 1)$
b. $(2^{n-1} - 1), -(2^{n-1})$
c. $2^{n-1}, -2^{n-1}$
d. $2^{n-1}, -(2^{n-1}-1) *$
299. The sum of two n - bit binary numbers will be
a. n - bits
b. n + 1 bits *
c. n + 2 bits
d. n + n bits
300. The maximum number of bits required to represent 31_{10} is
a. 5
b. 6 *
c. 7
d. 8
301. The maximum number of bits required to represent -9_{10} is
a. 5 *
b. 6
c. 7
d. 8
302. Output of the sequential circuit depends on
a. only present input *
b. on the past and present inputs
c. past output
d. past input and output
e. present input and the past output
303. Output of the sequential circuit depends on
a. only present input
b. on the past and present inputs
c. past output
d. past input and output *
e. present input and the past output
304. The largest positive number of 16 - bit in 2's complement is
a. 256
b. 1024
c. 32767 *
d. 32768
e. 65536. $(2^{n-1} - 1 = 2^{15} - 1 = 32767)$.
305. The largest negative number of 8 - bit in 2's complement is
a. -127
b. -128
c. -256 *
d. -255
 $(-2^{n-1} = -2^{8-1} = -2^7 = -128)$.
306. Devices used in digital circuits usually operate as
a. rectifier
b. amplifier
c. switch *
d. signal generator

307. The logic operations are usually specified in the form of
 a. transfer function b. truth table *
 c. output versus input graph
308. Most suitable gate to check even or odd numbers of 1's in any digital word is
 a. X-OR * b. NAND
 c. NOT d. NOR
309. Which of the following gates is called universal gate
 a. OR b. AND
 c. NOR * d. NOT
310. Which of the following gates is called universal gate
 a. OR b. AND
 c. NAND * d. NOT
311. Any logical expression can be realized using only
 a. AND Gate b. OR gate
 c. NAND gate * d. NOT gate
312. Any logical expression can be realized using only
 a. AND Gate
 b. OR gate
 c. AND, OR and NOT gates *
 d. NOT gate
313. If $A = B \oplus C \oplus D \oplus \dots$, $A = 0$, only when
 a. even numbers of input variables are logic - 1
 b. odd numbers of input variables are logic - 1 *
 c. even numbers of input variables are logic - 0
 d. odd numbers of input variable are logic - 0
314. If $A = B \oplus C \oplus D \oplus \dots$, $A = 0$, only when
 a. even numbers of input variables are logic - 1 *
 b. odd numbers of input variables are logic - 1
 c. even numbers of input variables are logic - 0
 d. odd numbers of input variable are logic - 0
315. Which of the following gates is INHIBITED (DISABLED) by connecting all of its input terminals to logic - 0
 a. OR b. AND *
 c. NAND d. NOR
316. What is the logic of an INHIBITED AND gate
 a. 0 * b. 1 c. undefined
317. If one of the inputs of an AND gate is labelled as ENABLE, the control input is
 a. active LOW b. active HIGH *
 c. undefined
318. If one of the inputs of an AND gate is labeled as DISABLE (INHIBIT), the control input is
 a. active LOW * b. active HIGH
 c. undefined
319. Which of these gates require strobe signal of logic - 1
 a. OR b. AND *
 c. NOT
320. Which of these gates require all its input as logic - 1 to produce logic - 1 output
 a. NAND or NOR b. AND or OR *
 c. OR or X-OR
321. Pick - up the correct expression
 a. $\overline{A \bullet B} = \overline{A} + \overline{B}$ * b. $\overline{A \bullet B} = A + B$
 c. $\overline{A \bullet B} = A \bullet B$
322. Pick - up the correct expression
 a. $\overline{A + B} = \overline{A} + \overline{B}$ * b. $\overline{A + B} = A \bullet B$
 c. $\overline{A + B} = A + B$
323. Both inputs at logic - 1 is banned in
 a. SR FF * b. JK FF
 c. T FF
324. The positive edge triggered FF transfer data from input to output on the
 a. LOW to HIGH transition of the CLK *
 b. HIGH to LOW transition of the CLK
325. The master - slave J - K FF is an example of
 a. pulse triggered *
 b. negative edge triggered
 c. positive edge triggered
326. Which of these flip - flops does not require CLK pulse
 a. D FF b. R - S F *
327. Output of the J - K FF will change only when
 a. $J = 0, K = 1$ b. $J = 1, K = 0$
 c. $J = K = 1$ * d. $J = K = 0$
328. The output Q of a D - FF is related to its D input as
 a. $Q \neq D$ b. $Q = D$ *
329. If input to T - FF is 10 KHz square wave, the output wave is
 a. 5 KHz b. 10 KHz
 c. 20 KHz * d. 40 KHz
330. The maximum number of binary states of a counter constructed with 8 - FFs is
 a. 8 b. 8^2
 c. 2^8 * d. 2^7
331. The maximum number of FFs required for a constructing a counter to yield 64 binary states is
 a. 4 b. 8
 c. 6^* d. 9
332. Generally first FF is designated to be
 a. LSB * b. MSB

333. The sequential circuit usually consists of
 a. only FFs b. FFs and gates *
 c. Only gates
334. Designing logic circuit in the SOP form is most suitable with
 a. AND gates b. OR gates
 c. NAND gates * d. NOR gates
335. Designing logic circuit in the POS form is most suitable with
 a. AND gates b. OR gates
 c. NAND gates d. NOR gates *
336. In K - map simplification how many adjacent min terms or max terms are combined
 a. 2^{n-1} b. 2^n *
 c. 2^{n+1} d. 2^{-n+1}

337. The symbol shown in Fig. represents



- a. Invert * b. XNOR gate
 c. XOR gate d. None of the above

338. Integrated circuit logic gates contain the properties of
 a. resistors
 b. diodes
 c. bipolar junction transistors
 d. all of the above *
339. IGFET is
 a. Integrated gain field effect transistor
 b. Infinite gain field effect transistor
 c. imaginary grid field effect transistor
 d. Insulated gate field effect transistor *

340. MOFET is
 a. Metal oxide semi - conductor FET *
 b. Mixed oscillator series FET
 c. Mono overload silicon FET
 d. Multiband oscillator static FET

341. The basic DTL configuration is
 a. NAND gate * b. NOR gate
 c. OR gate d. XOR gate

342. The symbol in Fig. represents



- a. OR gate * b. XOR gate
 c. NOR gate d. XNOR gate

343. In Boolean algebra, $A + A + A + A \dots + A$ is the same as
 a. nA b. A^n
 c. zero d. A^*

344. In Boolean algebra, $1 + A + B + C$ is equal to
 a. A b. 1^*
 c. $1 + A$ d. $1 + 3A$
345. According to Boolean algebra, if $A = 0, B = 0$, then $\overline{A} \overline{B}$ is
 a. 0^* b. 1
 c. 10 d. none of the above
346. One's complement of a binary number can be found by
 a. Changing all zero to ones
 b. Changing all ones to zero
 c. Changing all ones to zeros and all zeros to ones *
 d. Changing all zeros to ones in case of odd decimal numbers and changing all ones to zeros in case of even decimal numbers

347. The Boolean expression for AND gate is
 a. $a + B = Y$ b. $A \cdot B = Y^*$
 c. $A = B$ d. $A - B = Y$

348. $A + B = Y$ is the Boolean expression for
 a. AND gate b. XNOR gate
 c. NOR gate d. none of the above *

349. $\overline{AB} = Y$ is the Boolean expression for
 a. OR gate b. NOR gate
 c. NAND gate * d. None of the above

350. $A = \overline{A}$ is the Boolean expression for
 a. adder b. subtractor
 c. inverter * d. multiplier

351. $\overline{A + B} = Y$ is the Boolean expression for
 a. XNOR gate b. XOR gate
 c. AND gate d. NOR gate *

352. The Boolean expression for the truth table shown below will be

Inputs		Output	
C	B	A	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

- a. $CBA + \overline{CBA} = Y$
- b. $\overline{CBA} + C\overline{BA} = Y$
- c. $CB\overline{A} + = Y$
- d. $C + \overline{BA} + CB\overline{A} = Y *$

353. Which gate is formed by inversion of the output of the AND gate ?
- a. NAND gate *
 - b. NOR gate
 - c. OR gate
 - d. XNOR gate
354. The symbol shown in Fig. represents



- a. Inverter
 - b. Glip flop
 - c. AND gate *
 - d. NAND gate
355. Which gate corresponds to the action of parallel switches ?
- a. AND gate
 - b. OR gate *
 - c. NOR gate
 - d. NAND gate
356. The symbol shown in Fig. represents



- a. NOR gate *
 - b. OR gate
 - c. XOR gate
 - d. XNOR gate
357. In case of OR gate, no matter what the number of inputs,
- a. 0 at any input causes the output to be at logic 1
 - b. 0 at any input causes the output to be at logic 0
 - c. 1 at any input causes the output to be at logic 0
 - d. 1 at any input causes the output to be at logic 1 *
358. A combination of AND function and NOT function will result in
- a. AND gate
 - b. NAND gate *
 - c. NOR gate
 - d. XNOR gate
359. The symbol shown in Fig. represents



- a. OR gate
 - b. NOR gate
 - c. XNOR gate *
 - d. AND gate
360. Which is identical to the action of two series switches?
- a. AND *
 - b. NAND
 - c. OR
 - d. NOR
361. Which logic function has the output low only when both inputs are high ?
- a. AND
 - b. NAND *
 - c. OR
 - d. NOR

Questions 362 and 363 refer to Fig.

362. What is the Boolean expression for figure ?

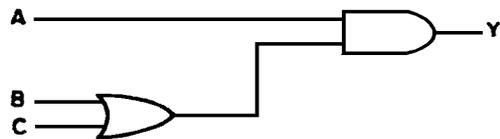


- a. $Y = \overline{A} + B$
 - b. $Y = A + \overline{B}$
 - c. $Y = AB$
 - d. $Y = \overline{AB} *$
363. If both inputs are high, what will be the output ?
- a. 1
 - b. 0 *
 - c. either 1 or 0
 - d. none

Questions 364 and 365.

364. An AND gate has 7 inputs. How many input words are in its truth table ?
- a. 7
 - b. 49
 - c. 81
 - d. 128 *
365. What is only input word that produces a 1 output ?
- a. 1010101
 - b. 1001001
 - c. 1111000
 - d. 1111111 *

Questions 366 and 367 refer to Fig.



366. The Boolean expression for the figure is
- a. $Y = ABC$
 - b. $Y = (A + B)C$
 - c. $Y = A(B + C) *$
 - d. $Y = \overline{ABC}$
367. If all inputs are high, the output will be
- a. 0
 - b. 1 *
 - c. 0 or 1
 - d. none of these
368. An inverter is a gate with
- a. only one input
 - b. only two inputs *
 - c. only three inputs
 - d. two or more inputs
369. The OR gate has two or more input signals. In this gate
- a. if any input is low, the output is low
 - b. if any input is low, the output is high
 - c. if any input is high, the output is high *
 - d. if any input is high, the output is low
370. The number of input words in a truth table always equals, where n is the number of input bits
- a. 2n
 - b. 2n + 1
 - c. 2(n + 1)
 - d. 2ⁿ *
371. In AND gate

- a. All inputs must be high to get a high output *
- b. All inputs must be high to get a low output
- c. All inputs must be low to get a low output
- d. All inputs must be low to get a high input

372. Double inversion occurs when two inverters are cascaded. Such a connection acts like

- a. an inverter
- b. a non - inverter *
- c. both a. and b. above
- d. none of the above

373. In Boolean algebra, the over bar stands for the NOT operation, the plus sign stands for the operation, and the times sign for the operation

- a. AND NAND
- b. NAND OR
- c. OR NAND
- d. OR AND *

374. A gate can have input signals and output signals

- a. one one
- b. two two
- c. two or more one *
- d. two or more two or more

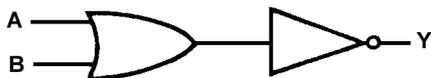
375. An OR gate has 6 inputs. How many input words are there in its truth table ?

- a. 6
- b. 36
- c. 64 *
- d. 64,000,000

376. In the above case, what is the only input word that produces a 0 output ?

- a. 101010
- b. 111111
- c. 100100
- d. 000000 *

Questions 377 and 378 refer to Fig.



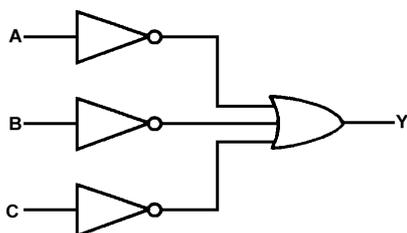
377. The Boolean equation for the figure is

- a. $Y = AB$
- b. $Y = \overline{AB}$
- c. $Y = A + B$
- d. $Y = \overline{A + B}$ *

378. The output when both the inputs are high will be

- a. low *
- b. high

Questions 379 to 380 refer to Fig.



379. The Boolean expression for the circuit is

- a. $Y = ABC$
- b. $Y = \overline{A} \overline{B} \overline{C}$
- c. $Y = A + B + C$
- d. $Y = \overline{A} + \overline{B} + \overline{C}$ *

380. In case all the inputs are high, the output will be

- a. 1
- b. 0 *

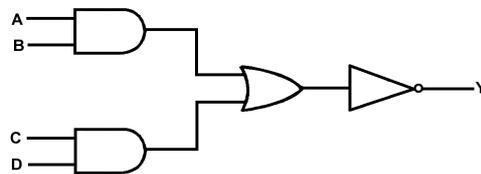
381. What ABC input words does the circuit recognise ?

- a. 010 to 100
- b. 000 to 100
- c. 000 to 110 *
- d. 100 to 111

382. What is the only word it disregards ?

- a. 000
- b. 100
- c. 101
- d. 111 *

Questions 383 to 385 refer to Fig.



383. What is the Boolean expression for the figure

- a. $Y = ABCD$
- b. $Y = \overline{ABCD}$
- c. $Y = AB + CD$
- d. $Y = \overline{AB + CD}$ *

384. How many ABCD input words are in the truth table ?

- a. 4
- b. 8
- c. 16 *
- d. 64

385. Which input words does the circuit recognise ?

- a. 0000, 0001, 0010, 0100, 0101, 0110, 1000, 1001, 1010*
- b. 0000, 0001, 0010, 0100, 0110, 0101, 1000, 1100, 1111
- c. 0000, 0010, 0011, 0110, 0111, 0001, 1110, 1111
- d. 0000, 0001, 0010, 0011, 0100, 0101, 0111, 1000, 1111

386. In the following equations the equals sign means 'is equivalent to'. Which of the following is a negative logic ?

- a. 0 = 0V and 1 = +5V
- b. 0 = +5V and 1 = 0V *
- c. 0 = -5V and 1 = 0V
- d. All of the above

387. In a NAND gate all inputs must be

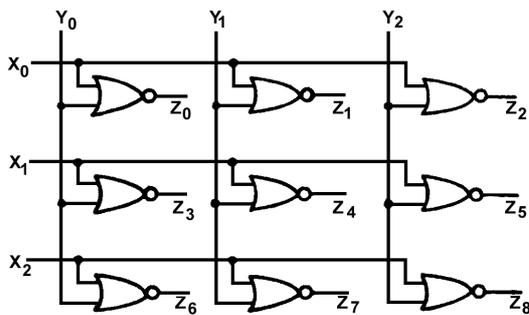
- a. low to get a low output
- b. high to get a high output
- c. low to get a high output
- d. high to get a low output *

388. According to De Morgan's second theorem

- a. A NAND gate is always complimentary to an AND gate
- b. A AND gate is equivalent to a bubbled NAND gate
- c. A NAND gate is equivalent to a bubbled AND gate

- d. A NAND gate is equivalent to a bubbled OR gate*
- 389. A 2 - input XOR gate has a high output only when
 - a. the input bits are zero
 - b. the input bits are low
 - c. the input bits are same
 - d. the input bits are different *
- 390. A NOR gate recognizes only the input word whose bits are
 - a. 0s *
 - b. 1s
 - c. either 0s or 1s
- 391. A NOR gate is logically equivalent to
 - a. an OR gate followed by a AND gate
 - b. an OR gate followed by a NAND gate
 - c. a AND gate followed by OR gate
 - d. an OR gate followed by an inverter *
- 392. According to De Morgan's theorem
 - a. a NOR gate is equivalent to a AND gate for identical inputs
 - b. AND gate is always complimentary to NAND gate
 - c. A NOR gate is equivalent to a bubbled AND gate*
 - d. none of the above
- 393. A NAND gate is equivalent to
 - a. an AND gate followed by a OR gate
 - b. an AND gate followed by an inverter *
 - c. an inverter followed by OR gate
 - d. an inverter followed by an AND gate

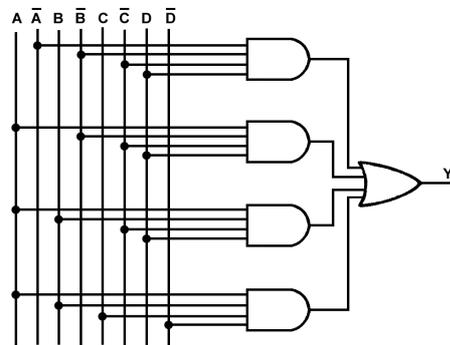
Questions 394 to 396 refer to Fig.



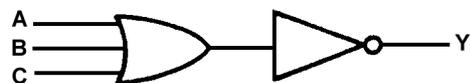
- 394. Fig. shows a NOR gate crossbar switch. If all X and Y inputs are high, which of the Z output will be high ?
 - a. Z_1 and Z_3
 - b. Z_0, Z_3 and Z_6
 - c. Z_2, Z_5 and Z_8
 - d. none of the above *
- 395. If all inputs are high except X_1 and Y_2 , which Z output will be high ?
 - a. Z_5 *
 - b. Z_6
 - c. Z_7
 - d. Z_3
- 396. If X_2 and Y_0 are low and all other inputs are high, which Z output will be high ?

- a. Z_2 and Z_4
- b. Z_1, Z_3 and Z_5
- c. Z_3, Z_6 and Z_8 *
- d. None

- 397. In case all NOR gates are replaced by NAND gates, then if all x and y inputs are low, which Z output will be low ?
 - a. Z_2 and Z_4
 - b. Z_1, Z_3 and Z_5
 - c. Z_3, Z_6 and Z_8
 - d. None of the above *
- 398. The output of the circuit shown will
 - a. $ABCD + \overline{ABCD} + \overline{ABCD} + \overline{ABCD}$
 - b. $ABCD + \overline{ABCD} + \overline{ABCD} + \overline{ABCD}$
 - c. $ABCD + \overline{ABCD} + \overline{ABCD} + \overline{ABCD}$
 - d. $\overline{ABCD} + \overline{ABCD} + \overline{ABCD} + \overline{ABCD}$ *



- 399. NAND - NAND circuits are equivalent to
 - a. AND - OR circuits *
 - b. OR - XOR circuits
 - c. OR - NOT circuits
 - d. all of the above
- 400. In a Karnaugh map, a pair eliminates one variable, a quad eliminates variables and an octet eliminates variables
 - a. two four
 - b. four eight
 - c. four sixteen
 - d. two three *
- 401. In a Kar naugh map the sequence in which pairs, quads and octets should be encircled is
 - a. pairs, quads and octets
 - b. octets, quads and pairs *
 - c. octets, pairs, and quads
 - d. quads, pairs and octets
- 402. When truth table is constructed for the circuit shown in Fig., the number of input words if would contain is
 - a. 5
 - b. 6
 - c. 8 *
 - d. 12



- 403. In the following equations the equals sign means 'is equal to'. Which of the following is a positive logic ?

- a. $0 = 0\text{ V}$ and $1 = +5\text{ V}$ *
- b. $0 = 0\text{ V}$ and $1 = -5\text{ V}$
- c. $0 = +5$ and $1 = 0\text{ V}$
- d. none of the above

404. A NOR gate has two or more input signals. In this

- a. all inputs must be high to get a high output
- b. all inputs must be high to get a low input
- c. all inputs must be low to get a low input
- d. all inputs must be low to get a high output *

405. XOR gates are ideal for testing parity because even - parity words produce a output and odd parity words produce a output

- a. low high *
- b. low low
- c. high high
- d. high low

406. An exclusive NOR gate is equivalent to

- a. an XOR gate followed by an inverter *
- b. an XOR gate followed by a OR gate
- c. a OR gate followed by NOR gate
- d. a OR gate followed by an inverter

407. In Fig. the two input points are connected together. It can be concluded that when A is low, Y will be and when A is high, Y will be

- a. high high
- b. low low
- b. low high
- d. high low *

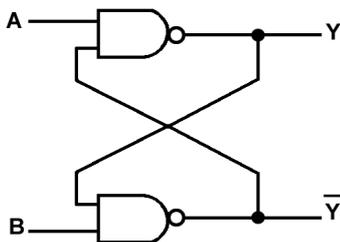


408. The circuit acts like an

- a. inverter *
- b. non - inverter

409. In Fig. if $A = 1$ and $B = 0$, Y will be

- a. 0 *
- b. 1
- c. High
- d. Low



410. In the above case \bar{Y} will be

- a. High
- b. Low
- c. 0
- d. 1 *

411. -13_{10} when expressed in 2's complement will be

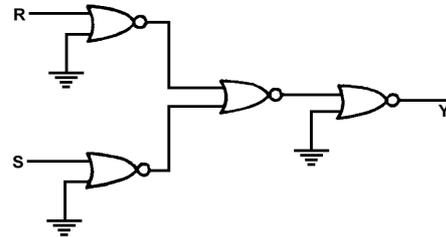
- a. 01100
- b. 01010
- c. 10011 *
- d. 10101

412. -162_{10} when expressed in 2's complement will be

- a. 101010101
- b. 101011110 *
- c. 111100000
- d. 100010001

413. The Boolean expression for Y in the given logic diagram will be

- a. $Y = RS$
- b. $Y = \overline{RS}$
- c. $Y = R + S$
- d. $Y = \overline{R} + \overline{S}$ *



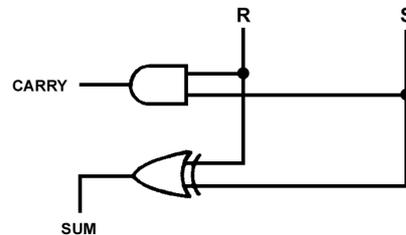
414. A NAND gate is called a universal logic element because

- a. it is used by every body
- b. any logic function can be realized by NAND gates alone *
- c. all the minimization techniques are applicable for optimum NAND gate realization
- d. many digital computers use NAND gates

415. If A and B represent the inputs of an 'EXCLUSIVE OR' logic gate circuit, its output Y is given by

- a. $Y = A \bar{B} + \bar{A} B$ *
- b. $Y = AB + \bar{A} B$
- c. $Y = A + B + AB$
- d. $Y = A + B + \bar{A} B$

Questions 416 and 417 refer to Fig.



416. The inputs R and S produce outputs of Carry and sum. What will be the values of CARRY and SUM for input $R = 0$ and $S = 0$?

- a. 0, 0 *
- b. 1, 0
- c. 0, 1
- d. 1, 1

417. In which two cases the outputs will be identical ?

- a. a. and b.
- b. b. and c. *
- c. c. and d.
- d. b. and d.

418. Which of the following is a negative logic ?

- a. $0 = 3.6\text{ V}$, $1 = 7.2\text{ V}$
- b. $0 = 0\text{ V}$, $1 = 10\text{ V}$
- c. $0 = -1.5\text{ V}$, $1 = -0.75\text{ V}$
- d. $0 = 5\text{ V}$, $1 = 0\text{ V}$ *

419. Positive logic in a logic circuit is one in which

- a. logic 0 and 1 are represented by 0 and positive voltage respectively

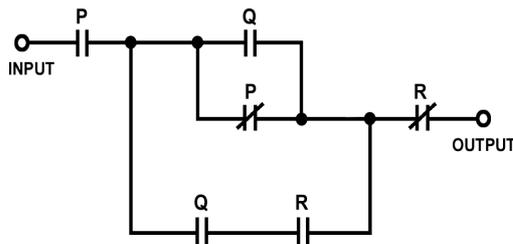
- b. logic 0 and 1 are represented by negative and positive voltages respectively
- c. logic 0 voltage level is higher than logic 1 voltage level
- d. logic 0 voltage level is lower than logic 1 voltage level *

420. A logic probe shows that one input lead to a two input OR gate is a logic '1' state and the other is at logic '0' state. The output of the gate should be at
- a. logic 0
 - b. logic 1 *
421. Which of the following is a positive logic ?
- a. $0 = 0\text{ V}, 1 = 10\text{ V}$ *
 - b. $0 = 0.2\text{ V}, 1 = -3.6\text{ V}$
 - c. $0 = -0.8\text{ V}, 1 = -1.5\text{ V}$
 - d. $0 = 5\text{ V}, 1 = 0\text{ V}$

Questions 422 and 423 refer to Fig.

In the given circuit, P, Q and R represent the normally open or normally closed contacts that are actuated by relays P, Q and R.

422. The Boolean equation for the output will be



- a. $\text{Output} = PQR + P\bar{Q}R + \bar{P}QR$
- b. $PQ + \bar{Q}R + \bar{P}R$
- c. $PQR + P\bar{P}R + QR\bar{R}$ *
- d. $\bar{P}\bar{Q}R + PQR + \bar{P}QR$

423. If it is given that $P\bar{P} = R\bar{R} = 0$, the output will be

- a. PQR *
- b. $\bar{P}QR$
- c. $\bar{P}QR$
- d. $\bar{P}\bar{Q}R$

424. Which of the following statement is false ?
- a. A NOT circuit has single input and single output
 - b. It is possible to construct a NOR gate from a combination of NAND gates
 - c. Boolean expression for 3 - input AND gate is $A + B + C = D$ *
 - d. An IC consists of both active and passive elements

425. Which of the following statement is true ?
- a. ICs are always linear
 - b. Digital circuits are linear circuits
 - c. AND gate is a logic circuit whose output is equal to its highest input

- d. In a four - input AND circuit, all inputs must be UP for the output to be UP *

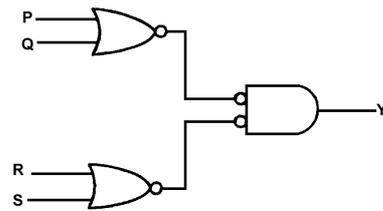
426. A certain 3 - input logic gate has its three inputs $A = 1, B = 0$ and $Z = 0$. If its output $Y = 1$, the gate is
- a. NOR *
 - b. AND
 - c. OR
 - d. NAND

427. Match the following

Column - I (GATE)	Column - II (Boolean Expression)
a. NOR	i. $Y = A \cdot B$
b. AND	ii. $Y = A + B$
c. NAND	iii. $Y = A \bar{B}$
d. OR	$Y = \overline{A + B}$

- a. a - i, b - ii, c - iii, d - iv
- b. a - ii, b - iii, c - iv, d - i
- c. a - iii, b - i, c - ii, d - iv
- d. a - iv, b - i, c - iii, d - ii *

Questions 428 to 429 refer to Fig.



428. How many words are in the truth table of Fig. ?
- a. 2
 - b. 4
 - c. 8
 - d. 16 *

429. In which of the following case, the value of Y will be 0 ?
- a. $PQRS = 0011$ *
 - b. $PQRS = 0110$
 - c. $PQRS = 1001$
 - d. All of the above

430. In which of the following case, the value of Y will be
- a. $PQRS = 1100$
 - b. $PQRS = 0011$
 - c. $PQRS = 1001$ *
 - d. None of the above

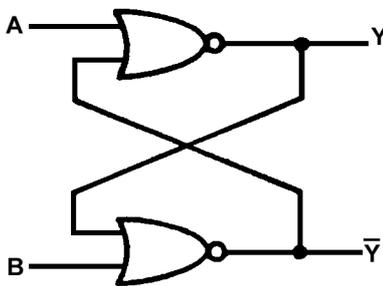
431. Digital computers are more widely used as compared to analog computers, because they are
- a. less expensive
 - b. always more accurate and faster
 - c. useful over wider ranges of problem types *
 - d. easier to maintain

432. Match the following :

Column - I (Boolean)	Column - II (Identities)
a. $A + \bar{A}B$	i. 0
b. $1 + A$	ii. $A + B$
c. $A(A + B)$	iii. 1
d. $A \cdot A$	iiii. A

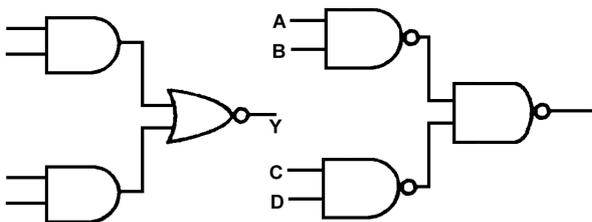
- a. a - i, b - ii, c - iii, d - iv
- b. a - ii, b - iii, c - iv, d - i *
- c. a - iii, b - iv, c - i, d - ii
- d. a - iv, b - i, c - ii, d - iii

433. A NAND gate with all inputs shorted forms the logical
- a. NOT function *
 - b. NOR function
 - c. OR function
 - d. ANF function
434. An OR gate will be off when
- a. one of the inputs is OFF
 - b. all the inputs are OFF
 - c. all the inputs are ON *
 - d. none of the above
435. In Fig. the outputs are cross - coupled back to the inputs of the NOR gates. If A = 0 and B = 1, Y will be
- a. 1 *
 - b. 0



436. In the above case \bar{Y} will be
- a. 1
 - b. 0 *
437. The Boolean expression $Y = \bar{B} + \bar{A}C + BC$ when simplified, becomes
- a. \bar{A}
 - b. B
 - c. \bar{B}
 - d. \bar{C} *
438. The Boolean expression $(A + \bar{B})(\bar{A} + B + \bar{C})(\bar{A} + \bar{B} + C)$ when simplified becomes
- a. $B(A + C) + ABC$ *
 - b. $A(B + C)$
 - c. $\bar{A} \bar{B} \bar{C}$
 - d. ABC

Questions 439 and 440 refer to Fig.



439. The output of logic circuit a. will be
- a. $AB + CD$
 - b. ABCD
 - c. $(\overline{AB + CD}) *$
 - d. $\bar{A}V + CD$
440. From Fig. a. and b. it can be concluded that
- a. for the same input the output of (a) will be low and that of (b) high
 - b. for the same input the output of (a) will be high and that of (b) low
 - c. the two circuits are complementary to each other
 - d. the two circuits are equivalent *
441. A NAND gate has an OFF output
- a. when all of its inputs are off
 - b. when one of its inputs is off
 - c. only when all of its inputs are ON *
 - d. none of the above
442. A three input logic gate has its three inputs $A = 0, B = 1$ and $Z = 1$. If its output $Y = 1$, the gate would be
- a. NOT
 - b. NAND
 - c. NOR
 - d. OR *
443. Which sum of the following 8 bit numbers is equivalent to hexadecimal 2AH ?
- a. 0001 0000 and 0000 1000
 - b. 0001 1000 and 0000 1100
 - c. 0001 1100 and 0000 1110 *
 - d. 0010 1000 and 0011 1011
444. Which of the following hexagonal sum is equivalent to hexadecimal A 8 H ?
- a. 2 CH + 4 FH
 - b. 5 EH + 1 AH
 - c. 3 BH + 6 DH *
 - d. 5A5H + 2CH
445. Signed magnitude number 1001 1100 is equivalent to decimal number
- a. -27
 - b. -28 *
 - c. -38
 - d. -33
446. Which of the following sign magnitude number is equivalent to decimal + 49 ?
- a. 0001 1110
 - b. 1000 0111
 - c. 1001 1100
 - d. 0011 0001 *
447. 2's complement of 1110 0001 expressed in hexadecimal form will be
- a. 2BC
 - b. 3EF
 - c. 2GG
 - d. 1FH *
448. 2's complement of 1111 1101 expressed in hexadecimal form will be
- a. 03F
 - b. 03H *
 - c. 03G
 - d. 03E
449. An 8 - bit microprocessor uses 2's complement representation. In this the decimal number - 19 will be represented as
- a. 1101 1011
 - b. 1111 1001

c. 1110 1101 * d. 1100 1100 →

450. Which of the following 2's complement when expressed in hexadecimal form, is equivalent to F 9H?

- a. 0000 0111 * b. 1111 1111
- c. 1111 1101 d. 1110 0001

451. An 8-bit microprocessor uses 2's complement representation. The decimal number - 48 will be represented as ?

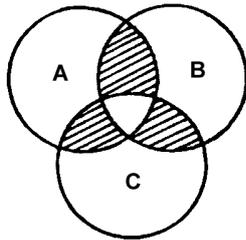
- a. 1001 1001 b. 1110 1110
- c. 1111 1111 d. 1101 0000 *

452. An 8 - bit microprocessor uses 2,s complement representation. The decimal number + 37 will appear as

- a. 0010 0111 b. 0101 1001
- c. 1001 1001 d. 0010 0101 *

453. The Boolean expression for shaded area shown in Fig. is given by

- a. $ABC + \overline{A}\overline{B}\overline{C}$
- b. $\overline{A}\overline{B}\overline{C} + \overline{A}\overline{B}C + \overline{A}B\overline{C}$ *
- c. $\overline{A}\overline{B}\overline{C} + \overline{A}\overline{B}C + \overline{A}B\overline{C}$
- d. $AB + BC + CA$

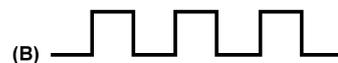
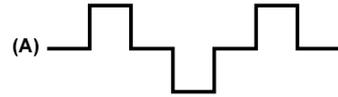
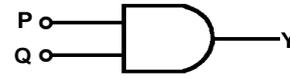
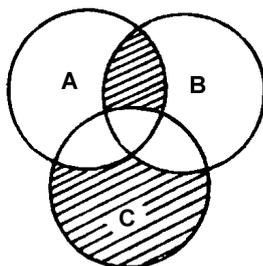


454. $(X + Y) \cdot (\overline{X} \cdot \overline{Z} + Z) \cdot (\overline{Y + X \cdot Z})$ when simplified becomes

- a. XYZ b. X+Y+Z
- c. XY+YZ+ZX d. 0 *

455. The Boolean expression for shaded area shown in Fig. is given by

- a. $AB + \overline{B}\overline{C}$
- b. $\overline{A}\overline{B}\overline{C} + \overline{A}\overline{B}C + \overline{A}B\overline{C}$
- $\overline{A}\overline{B}C$



CHAPTER - 16

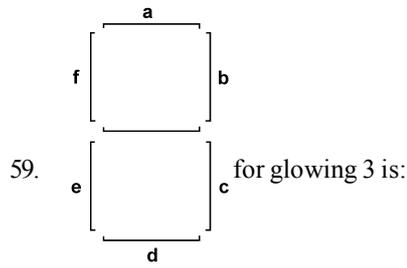
LED & LCD

1. Photoconductive devices are made of
 - a. highly conductive material
 - b. semiconductor material *
 - c. radioactive material
 - d. photoresistive device
2. Light dependent resistor is type of
 - a. photovoltaic device
 - b. photoemissive device
 - c. radioactive device
 - d. photoresistive device *
3. In a photoemissive device the number of electrodes is
 - a. 2 *
 - b. 4
 - c. 3
 - d. 6
4. Efficiency of emission of a photoemissive device can be increased by
 - a. cooling the cathode plate
 - b. decreasing the distance between the anode and the cathode
 - c. decreasing the area of the cathode plate
 - d. coating the cathode plate with an active metal *
5. Solar cell is a type of
 - a. photoconductive device
 - b. photoemissive device
 - c. photovoltaic device *
 - d. electromotive device
6. Light activated silicon controlled rectifier is a type of
 - a. semiconductor photoelectric switch *
 - b. photoemissive device
 - c. electromotive device
 - d. radioactive device
7. Light dependent resistors are prepared from
 - a. intrinsic semiconductors
 - b. highly doped semiconductors
 - c. lightly doped semiconductors *
 - d. insulating materials
8. Rating and control capabilities of an LDR depend upon the
 - a. type of light rays imparted on its surface
 - b. temperature of the surrounding
 - c. voltage applied
 - d. amount of semiconductors film deposited on the insulating base *
9. A light dependent resistor behaves like a
 - a. capacitor
 - b. dielectric medium
 - c. switch *
 - d. battery
10. A light emitting diode (LED) is a
 - a. display device *
 - b. storing device
 - c. Zener diode
 - d. voltage regulator
11. Radiation emitted by LED can be seen in the
 - a. ultraviolet region
 - b. visible spectrum
 - c. infrared region
 - d. visible as well as infrared region *
12. An LED causes emission of light due to
 - a. emission of electrons
 - b. generation of electromagnetic radiation *
 - c. conversion of heat energy into light energy
 - d. the photovoltaic effect
13. LEDs which radiate infrared rays, are manufactured by using
 - a. arsenide phosphide
 - b. gallium phosphide
 - c. gallium arsenide *
 - d. gallium arsenide phosphide
14. The forward - bias required by an LED for emission of light is
 - a. 1 to 2 V *
 - b. 4V
 - c. 8V
 - d. 5V
15. The efficiency of an LED for generating light is directly proportional to the
 - a. temperature
 - b. voltage applied
 - c. level of doping used
 - d. current injected *
16. A photodiode is a type of
 - a. photoconductive cell
 - b. photovoltaic cell
 - c. semiconductor P - N junction diode *
 - d. light dependent resistor
17. In case a reverse biased photodiode is kept in dark condition, the current flowing through the device corresponds to
 - a. maximum value of current which can flow through the device
 - b. value of reverse saturation current *
 - c. normal value of current
 - d. zero
18. The volt - ampere characteristic of a photodiode passes through the origin when light flux is
 - a. maximum
 - b. minimum
 - c. zero *
 - d. average of maximum and minimum value

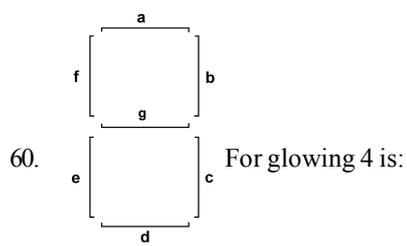
19. A phototransistor is connected in a circuit generally in
 a. common emitter configuration *
 b. common collector configuration
 c. common base configuration
 d. any of the above
20. Sensitivity of a phototransistor as compared to any other photosensitive semiconductor device is
 a. the same b. slightly less
 c. slightly more d. much more *
21. A photovoltaic cell is
 a. a photodiode without reverse bias voltage *
 b. type of phototransistor
 c. light dependent resistor
 d. photodiode with reverse bias voltage
22. Photovoltaic emf of semiconductor photodiode is that voltage at which the resultant current flowing through the device becomes
 a. minimum
 b. maximum
 c. zero *
 d. twice the value of the normal
23. Short circuit current starts flowing in a photovoltaic cell when
 a. it is kept in darkness
 b. it is kept in presence of luminous flux
 c. its terminals are shorted in the presence of luminous flux
 d. its terminals are shorted in the presence of luminous flux *
24. A photoconductive cell is basically a
 a. light emitting diode (LED)
 b. light dependent resistor (LDR) *
 c. photo - diode
 d. photoelectric relay
25. The value of dark - current of a photoconductive cell is
 a. negligibly small * b. very high
 c. zero d. high
26. The cadmium sulphide layer of a cadmium sulphide cell purposely has some impurities in it to increase the
 a. voltage rating of the cell
 b. efficiency of the cell *
 c. ampere - hour rating of the cell
27. The process of emission of light from a solid with the excitation provided by an electrostatic field is called
 a. luminance
 b. electroluminescence *
 c. electroemission
 d. none
28. The injection process in the LED is
 a. minority carrier injection *
 b. majority carrier injection
29. Ge or Si semiconductors do not emit light because most of the energy is
 a. dissipated in generation of holes
 b. dissipated in generation of electrons
 c. dissipated in heat *
30. The colour of LED depends on
 a. energy involved *
 b. colour used
 c. heat evolve
31. LEDs are devices with the power in the range of
 a. Kilowatt b. Watt
 c. Megawatt d. Milliwatt *
32. A good material for LED should have energy gap in the
 a. Ultraviolet range
 b. Visible range *
 c. Infrared range
33. Direct band gap LEDs have emission in the
 a. UV range
 b. Visible range
 c. Infrared range *
34. Photon absorption due to the capacity of LED material causes
 a. Low quantum efficiency *
 b. high quantum efficiency
 c. No change in efficiency
35. The light emitted by the LED is a function of the
 a. Voltage
 b. Temperature
 c. current *
36. If the forward current in the LED is doubles, the radiant output power approximately
 a. doubles
 b. remains the same *
 c. become half
37. If the junction temperature of LED is increased, the radiant output power
 a. decreases *
 b. increases
 c. remains same
38. The output colour of the GaAsP LED is
 a. yellow b. green
 c. amber d. red *
39. The breakdown voltage for LED is approximately
 a. 1.6 V * b. 0.72 V
 c. 1.12 V d. 9V
40. The quantity of emitted photon does not depend on
 a. the LED material b. critical angle loss
 c. Fresnel loss d. none *

- 41. When photons pass from one medium to another, a portion of high is reflected back to the medium interface causing
 - a. heat
 - b. critical angle loss
 - c. fresnel loss *
- 42. Best suited spectral response for the human eye can be obtained from
 - a. Germanium
 - b. Selenium *
 - c. Silicon
- 43. For the GaAsP red the wavelength lies in the range between
 - a. 600 to 700 nm *
 - b. 550 to 650 nm
 - c. 700 to 750 nm
 - d. none of these
- 44. Thermistor is a
 - a. junction device
 - b. temperature sensitive device *
 - c. current sensitive device
 - d. none of these
- 45. The photoconductive compound used in LDR is
 - a. CdS *
 - b. Ni
 - c. Cobalt oxide
 - d. GaAsP
- 46. The dark resistance of the LDR is of the order of
 - a. $K \Omega$
 - b. $m \Omega$
 - c. $M \Omega$ *
 - d. Ω
- 47. The drawback of LDR is that its resistance is dependent on
 - a. current
 - b. temperature *
 - c. material used
 - d. none of these
- 48. The variation of output current w.r.t. the illumination flux in the photodiode is
 - a. linear *
 - b. exponential
 - c. circular
 - d. parabolic
- 49. In photorelay circuits, the device used as actuator is
 - a. photodiode
 - b. LDR
 - c. phototransistor *
 - d. thermistor
- 50. The variation of short circuit current with luminous flux in photovoltaic cell is
 - a. linear *
 - b. exponential
 - c. non - linear
- 51. Display devices are:
 - a. I/p devices
 - b. O/p devices *
 - c. Both 'a' & 'b'
 - d. None
- 52. If the value of the quantity are to be taken as a function of Time, this instrument known as:
 - a. Time domain o/p devices *
 - b. Single No. o/p devices
 - c. M/c interpretable o/p
 - d. None

- 53. If the entire read out character in the same plane known as:
 - a. Planar *
 - b. Nonplanar
 - c. Both 'a' & 'b'
 - d. None
- 54. When the character are displayed in different plane known as:
 - a. Planar
 - b. Nonplanar *
 - c. Segmetal
 - d. None
- 55. The planar display may be:
 - a. Dot matrix type *
 - b. Rear projection
 - c. Gaseous discharge
 - d. None
- 56. Non planar display may be:
 - a. Gaseous discharge *
 - b. Dot matrix
 - c. Segmetal type
 - d. None
- 57. LED is known as:
 - a. Light emitting diode *
 - b. Light enhanced diode
 - c. Low emitting diode
 - d. None
- 58. LCD is known as:
 - a. Liquid crystal diode *
 - b. Light crystal diode
 - c. Light control diode
 - d. None



- a. a, b, c, d, g *
- b. f, a, b, c, d, e
- c. a, b, c, d, e, g
- d. None



- a. f, g, b, c, d *
- b. f, g, c, d, e
- c. a, f, e, d, c, b
- d. None

- 61. Seven segmental on display is used for:
 - a. Numeric display *
 - b. Alpha numeric display
 - c. Both 'a' & 'b'
 - d. None
- 62. For display Alpha numeric character we use:
 - a. Seven Segment display
 - b. Fourteen Segment display *

87. The disadvantage of LED are:
 a. High power requirement *
 b. Low power requirement
 c. No power requirement
 d. None
88. LCD is known as:
 a. Liquid capacitor diode
 b. Liquid crystal diode *
 c. Light crystal diode
 d. None
89. LCD's are:
 a. Dynamic scattering type
 b. Field effect type
 c. Both 'a' & 'b' *
 d. None
90. The liquid crystal material may be of several organic compounds which exhibit:
 a. Optical property * b. Electrical property
 c. Both 'a' & 'b' d. None
91. LCD are:
 a. Transmittive type b. Reflective type
 c. Both 'a' & 'b' * d. None
92. In transmittive type LCD:
 a. Both glass sheet are transparent *
 b. One glass sheet is transparent
 c. Both glass sheet are opaque
 d. None
93. LCD which has reflecting surface on one side:
 a. Transmittive type b. Reflective type *
 c. Both 'a' & 'b' d. None
94. The LCD have:
 a. Low power consumption *
 b. High power consumption
 c. Very high consumption
 d. None
95. LCD has:
 a. High cost b. Low cost *
 c. Both 'a' & 'b' d. None
96. LCD is basically:
 a. Very fast device b. Very slow device *
 c. Both 'a' & 'b' d. None
97. The turn ON time of LCD is:
 a. Few milli second * b. Few m sec.
 c. Few sec. d. None
98. The turn off time of LCD is:
 a. 10 ms * b. 20 ms
 c. 40 ms d. None
99. LCD used in D.C., their life span is:
 a. Very high b. Very small *
 c. Both 'a' & 'b' d. None
100. LCD occupy:
 a. Large area * b. Small area
 c. No area d. None
101. An LED is a solid state device comprising a
 a. Reverse biased PN junction transistor
 b. Forward biased PN junction transistor *
 c. Reverse biased NP junction transistor
 d. Forward biased NP junction transistor
102. An LED is a solid state device comprising a transistor formed from a slice or chip of
 a. Silicon
 b. gallium phosphide
 c. Gallium Arsenide Phosphide *
 d. Carbon
103. When current flows through the chip of LED
 a. it emits electrons b. it emits light *
 c. it does not emit light d. it emits not light
104. Light emission in LED is
 a. directly proportional to current flow *
 b. inversely proportional to current flow
 c. directly proportional to capacitance
 d. inversely proportional to capacitance
105. Light emission in different colours of spectrum can be obtained
 a. By varying the proportion of elements comprising the chip
 b. by technique of doping
 c. by both a & b *
 d. none of the above
106. Light emission in different colours can be obtained by doping with the element
 a. Oxygen b. Carbon
 c. Hydrogen d. Nitrogen *
107. LCD consist of
 a. 4 glass plates coated on their outer surfaces
 b. 4 glass plates coated on their inner surfaces
 c. 2 glass plates coated on their outer surfaces
 d. 2 glass plates coated on their inner surface *
108. Which statement is correct
 a. LCD emits light
 b. LCD does not emits light
 c. as in b and acts on light passing through it *
 d. All of the above are correct
109. Inner surface of two glass plates of LCD are coated with a thin film of transparent conducting material, referred to as
 a. polishing film b. polarising film *
 c. coating film d. either a. or b.

110. Which statement is true about LCD
- The space between plates is filled with air
 - The space between plates is filled with liquid crystal compound *
 - The space between plates is filled with water
 - There is no space between plates of LCD.
111. LED display represents
- Logic electrostatic diode
 - Loop emitter decoder
 - Long emission diac
 - Light emitter diode *
112. Which consumes less amount of power
- LCD *
 - LED
 - Both a. & b.
113. Which liquid crystal is used for LCD display
- Mercury
 - Nematic fluid *
 - Aqua regia
 - Liquid Burn
114. Which needs dc forward voltage to emit light
- LED *
 - LCD
 - both a. and b.
 - none of the above

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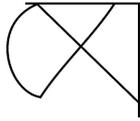
CHAPTER - 17

KNOWLEDGE OF CRT AND ITS APPLICATION

1. Synchronization has to be done to obtain:
 - a. Stationary pattern *
 - b. Dynamic pattern
 - c. Both
 - d. None
2. Stationary pattern is obtained by:
 - a. Synchronization *
 - b. Non Synchronization
 - c. Both
 - d. Not obtained
3. In the internal Synchronization, trigger is obtained from:
 - a. Vertical amplifier *
 - b. From External source
 - c. From Power supply
 - d. Above all
4. Vertical amplifier used to trigger:
 - a. Internal Synchronization *
 - b. External Synchronization
 - c. Line Synchronization
 - d. Above all
5. External trigger is required:
 - a. Internal Synchronization
 - b. External Synchronization *
 - c. Line Synchronization
 - d. Above all
6. Power supply is used for triggering:
 - a. Internal Synchronization
 - b. Line Synchronization *
 - c. Both
 - d. None
7. The Saw tooth sweep voltage is applied to:
 - a. X-plate *
 - b. Y-plate
 - c. Both
 - d. None
8. Intensity modulation is done by:
 - a. Inserting a signal b/w ground and Cathode *
 - b. Inserting a signal b/w ground and Focus
 - c. Both
 - d. None
9. Astigmatism is used for:
 - a. Additional focusing control *
 - b. Intensity control
 - c. Position control
 - d. Above all
10. In CRO, the wave form under test is applied:
 - a. Y-plate *
 - b. X-plate
 - c. Both
 - d. None
11. Saw tooth generator is applied to:
 - a. X-plate *
 - b. Y-plate
 - c. Both
 - d. None
12. In CRO, for measurement of direct voltage by:
 - a. Static deflection of the spot *
 - b. Dynamic deflection of the spot
 - c. Not calculated
 - d. None
13. Sinusoidal voltage is applied both x-y plate Simultaneously to obtain:
 - a. Lissajous figure *
 - b. Sawtooth figure
 - c. Nothing to be said
 - d. Above all
14. Two Sinusoidal voltage with equal phase & frequency is applied to x & y plate to obtain:
 - a. Straight line *
 - b. Circle
 - c. Ellipse
 - d. Above all
15. For obtaining straight line on screen we apply the Sinusoidal voltage at x-y plate:
 - a. With same phase & frequency *
 - b. Different phase & frequency
 - c. Same phase different frequency
 - d. Same frequency different phase
16. CIRCLE is obtained by:
 - a. 90° phase difference b/w to Sinusoidal voltage *
 - b. No phase difference
 - c. 30° phase difference
 - d. Not obtained
17. At 90° phase difference of Sinusoidal voltage is applied we obtain:
 - a. Circle *
 - b. Ellipse
 - c. Line
 - d. Above all
18. Ellipse is obtained is phase difference:
 - a. 0°
 - b. 90°
 - c. b/w 0° to 90° *
 - d. Above all
19. Between 0° to 90° phase difference produce:
 - a. Ellipse *
 - b. CIRCLE
 - c. Line
 - d. Above all
20. Phase difference b/w two voltage is obtained by:
 - a. $\sin f = y_1/y_2$ *
 - b. $\sin f = x_1/x_2$
 - c. $\sin f = x_2/x_1$
 - d. Both 'a' & 'b'
21. If frequency of wave applied to y-plate is twice as compare to x-plate, the CRT spot will be:
 - a. Two complete circle *
 - b. Two uncomplete circle
 - c. Single absent here circle

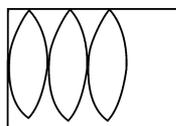
d. Above all

22. Frequency is obtained on the CRT screen by:
- Number of horizontal tangencies / Number of vertical tangencies *
 - Number of vertical tangencies / Number of horizontal tangencies
 - Both
 - None



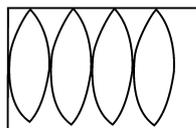
23. The frequency will be:

- 2:1 *
- 1:2
- 2:3
- None



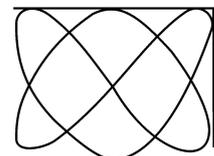
24. The frequency will be:

- 3:1 *
- 1:3
- 1:4
- Above all



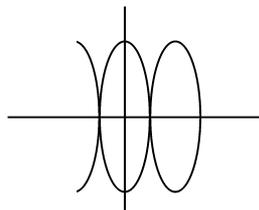
25. The frequency will be:

- 4:1 *
- 1:4
- 1:3
- 3:1



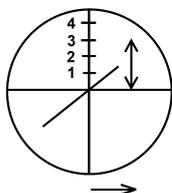
26. The frequency will be:

- 3:2 *
- 2:3
- 1:3
- 2:4



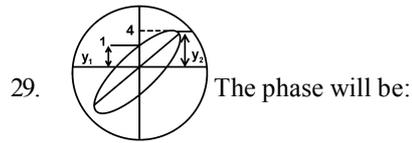
27. The frequency will be:

- 5:2 *
- 2:5
- 2.5:1
- Both 'a' & 'c'



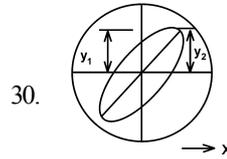
28. The phase will be:

- 0 *
- 30°
- 45°
- None



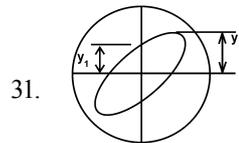
29. The phase will be:

- $f = \sin^{-1} 1/4$ *
- $f = \sin^{-1} 4/1$
- Both
- None



30. The phase will be:

- $\sin f = y1/y2$ *
- $\sin f = y2/y1$
- Both
- 45°



31. The phase will be in b/w:

- 0 to 90° & 100° to 270°*
- 90° to 180°
- 90° to 180° and 180° to 360°
- None

32. If we have to compare one signal to another we obtained:

- Multiple beam oscilloscope *
- Double beam oscilloscope
- Both
- None

33. Two electron gun is used:

- Double beam oscilloscope *
- Multiple beam oscilloscope
- Both
- None

34. Sampling oscilloscope can be used:

- Upto 10 GHz *
- Below 50 GHz
- Both
- None

35. Sampling Techniques cannot be used to display for:

- Transient wave form *
- Steady state wave form
- Both
- None

36. Investigation of Transient wave form we use:

- Sampling oscilloscope
- Impulse wave form oscilloscope *
- Scanning oscilloscope
- Above all

37. Impulse wave form oscilloscope is used for:

- Transient wave form
- Non period phenomenon
- Both *
- None

- a. Electron gun b. Deflection plate
c. Fluorescent screen d. Above all *
60. For focusing and accelerating the electron beam by:
a. Electron gun *
b. Heater
c. Vertical deflection plate
d. None
61. Electron gun consist of:
a. Heater
b. Pre - accelerating anode
c. Both *
d. None
62. The electron gun is used:
a. To emitter the electron *
b. To absorb the electron
c. Both
d. None
63. Usually in control grid used:
a. Nickel cylinder * b. Cadmium cylinder
c. Aluminium cylinder d. Above all
64. The control grid is:
a. +vely biased b. -vely biased *
c. Both d. None
65. Intensity of electron emission is controlled by:
a. Control grid * b. Accelerating anode
c. Both d. None
66. The electron beam is focused by:
a. Focusing anode * b. accelerating anode
c. Preaccelerating d. Above all
67. CRO uses focusing method:
a. Electrostatic focusing *
b. Electro magnetic focusing
c. Both
d. None
68. In electrostatic focusing, force on electron which is at rest placed in an electric field produced to parallel plate:
a. $F = -eE$ $E = \text{Electric field} *$
b. $F = +eE$
c. Both
d. None
69. Charge of electron:
a. $1.6 \times 10^{-19} \text{ C} *$ b. $.8 \times 10^{-19} \text{ C}$
c. $1.6 \times 10^{19} \text{ C}$ d. None
70. In TU picture tube used:
a. Electrostatic focusing
b. Electromagnetic focusing *
c. Both
d. None
71. $F = -eE$ is applicable if:
a. Electron is situated in a field of uniform intensity *
b. Non uniform intensity
c. Both
d. None
72. Preaccelerating and accelerating anode are:
a. Same potential * b. Different potential
c. Both d. None
73. Pre accelerating anode and accelerating anode kept at:
a. High +ve potential * b. Low +ve potential
c. High -ve potential d. Above all
74. Accelerating anode and focusing anode are kept at:
a. Same potential b. Different potential *
c. Both d. None
75. Focusing anode is kept at:
a. Lower potential as compare to preaccelerating and accelerating anode *
b. High potential
c. Both
d. None
76. By changing the voltage of the focusing anode:
a. The refractive index of the electron beam is changed *
b. No effect on refractive index
c. Nothing to be said
d. Above all
77. By changing the refractive index:
a. Focal point of the beam can be changed *
b. No change in focal point
c. Nothing to be said
d. Above all
78. The path of beam in electrostatic deflection:
a. Parabolic * b. Hyperbolic
c. Circle d. Above all
79. Deflection of electron beam:
a. $D = \frac{Lld Ed}{2d Ea} *$ b. $D = \frac{Ld Ed}{2ld Ea}$
c. $D = \frac{L}{2dEa}$ d. $D = \frac{ld Ed}{2d Ea}$
80. Deflection of electron beam is directly proportional to:
a. Deflecting voltage *
b. Voltage of preaccelerating anode
c. Both
d. None
81. CRT may be used as:
a. Linear indicating device *
b. Non linear indicating device

- c. Both
d. None
82. The deflection is:
a. Dependent of e/m ratio
b. Independent of e/m ratio *
c. Nothing to be said
d. None
83. The deflection of the screen per unit deflection voltage known as:
a. Deflection sensitivity *
b. Deflection factor
c. Not defined
d. Above all
84. Deflection factor of CRT & sensitivity are:
a. Proportional to each other
b. Reciprocal *
c. No relation
d. Nothing to be said
85. Deflection factor:
a. $G = \frac{2d Ea}{Lld}$
b. $G = \frac{2L1d}{2Ea}$ *
c. $G = \frac{2d}{Lld}$
d. $G = \frac{2d Ea}{Lld}$
86. Vertical deflection produced by:
a. Vertical deflection plate *
b. Horizontal deflection plate
c. Both
d. None
87. Horizontal deflection produces by:
a. Horizontal deflection plate *
b. Vertical deflection plate
c. Can not produce
d. Both 'a' & 'b'
88. Phosphor is widely used in CRT:
a. For screen material *
b. For protection from beam
c. Both
d. None
89. Voltage starting from some initial value and linearly varies with time known as:
a. Sweep time *
b. Retrace time
c. Fly back time
d. Above all
90. Voltage linearly varies to the maximum value and return to its initial value called:
a. Retrace time
b. Flyback time *
c. Both
d. None
91. Sweep generator uses on:
a. RC Circuit *
b. LC Circuit
c. Both
d. None
92. As a switch may be used:
a. Vacuum tube
b. SCR
c. Transistor *
d. Above all
93. Voltage applied to the vertical deflection plate changes during the transit time of the electrons through the horizontal plate- The deflection sensitivity:
a. Decreased *
b. Increased
c. No effect
d. Nothing to be said
94. CRO application involve measurement of a quantity which varies:
a. w.r. to time *
b. w.r. to frequency
c. w.r. to phase
d. Above all
95. CRT spots moves across the screen:
a. With constant velocity *
b. With variable velocity
c. Both
d. Above all
96. Ramp voltage are applied:
a. Horizontal deflection plate *
b. Vertical deflection plate
c. Both
d. None
97. The CKT which develop ramp voltage called:
a. Time base generator *
b. Sweep generator
c. Both
d. None
98. For repetitive wave form we choose:
a. Free running sweep *
b. Triggered sweep
c. Driven sweep
d. Above all
99. The wave form is of a very short duration compare to the period of wave form we choose:
a. Triggered sweep *
b. Non saw tooth sweep
c. Free running
d. Above all
100. For comparison of two frequencies or for finding phase shift b/w two voltage we choose:
a. Triggered sweep
b. Non saw tooth sweep *
c. Both
d. None
101. The brightness of spot on a CRO is controlled by
a. anode voltage
b. heater filament voltage
c. grid voltage *
d. none of the above.
102. The electron lens of a CRO consists of
a. focusing electrodes *
b. grid and cathode
c. cathode and filament
d. shield and grid.
103. The deflection sensitivity of a CRO is expressed in
a. amperes/volt
b. volts/watt
c. cm²/watt
d. cm/volt *

104. A grounded isolation shield is situated between the vertical and horizontal deflecting plates to
- control the rate of deflection
 - make the spot clear and bright
 - prevent the electric fields of one plate from influencing the other pair of plates *
 - none of the above.
105. The phosphors used on CRO screen are basically
- conductors
 - insulators *
 - semi-conductors
 - electrically charged particles.
106. Graphite coating provided around the neck of the CRO tube is termed as
- aquadag *
 - black box
 - carbonyl
 - core magnet.
107. Aquadag is provided on CRO tubes to
- assist in focusing
 - prevent oscillations of beam
 - reduced the effect of eddy currents
 - collect the secondary emission electrons *
108. Sometimes in CRO tubes, the screen has a fine film of aluminium deposited on the surface at which the electrons strike. This is done to
- permit the electron beam to pass through but collect the secondary electrons and conduct them to ground
 - improve the brightness of the glow by reflecting the emitted light toward the glass
 - to act as a heat sink, conducting away heat that might otherwise damage the screen
 - all of the above *
109. In a CRO, if alternating voltage is applied to the vertical deflection plates and no input is applied to the horizontal plates, then the spot on the tube face will
- remain stationary
 - move up and down continuously *
 - move to and from horizontally
 - move in a sweep generator wave pattern.
110. A dual trace oscilloscope consists of
- single beam split into two by means of a differentiator circuit
 - two electron guns contained in a single tube *
 - single gun with two horizontal and vertical deflection coils
 - two sweep generators to split single beam into two beams.
111. In a dual beam oscilloscope
- there are two separate vertical input and two separate horizontal inputs
 - there are two separate vertical inputs and there is only one set of horizontal deflection plates *
 - there is only one vertical input but here are two separate horizontal deflection plates
 - there is only one vertical and one horizontal input.
112. Sawtooth voltage in CRO is produced in
- sweep generator *
 - Colpitts oscillatore
 - Hartley oscillator
 - none of the above.
113. a sweep generator consists of two major components
- a ramp generator and a trigger
 - an oscillator and a clipper
 - a Schmitt trigger and a clipper
 - a ramp generator and Schmitt trigger *
114. In a CRO if the input wave form is not synchronized with the ramp wave
- lissajous figures will be produced on the screen
 - only a spot will appear in the centre of the screen
 - the displayed wave will tend to slide off to one side of the screen *
 - none of the above
115. In CRO, Schmitt circuit is used to generate
- saw tooth waveform
 - square wave form *
 - triangular wave form
 - pure sinusoidal waveform.
116. In case the horizontal and vertical inputs to an oscilloscope are as shown in Fig. 1 the display on the screen will be as shown in
- Fig. 1.1 A
 - Fig. 1.1 B
 - Fig. 1.1 C *
 - Fig. 1.1 D

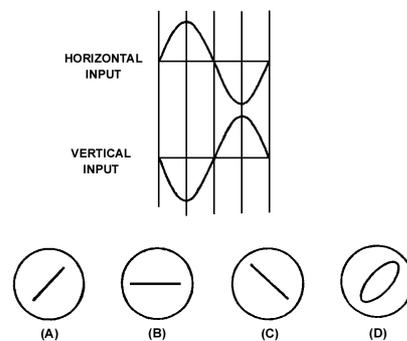


Fig. 1.1.

117. In case the horizontal and vertical inputs to an oscilloscope are as shown in Fig. 2. the display on the screen will be as shown in a
- Fig. 1.2 A *
 - Fig. 1.2 B
 - Fig. 1.2 C
 - Fig. 1.2 D

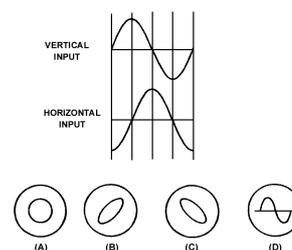


Fig. 1.2.

133. With a sweep time of one millisecond across the screen the approximate horizontal saw tooth frequency will be
 a. 1 kHz * b. 1 MHz
 c. 1 GHz d. none of the above.
134. On a cathode ray screen, the brightest spot occurs at
 a. the outer periphery
 b. the centre *
 c. midway between centre and outer periphery of screen
 d. brightness is same all over the screen
135. The secondary emission of electrons is due to
 a. thermal excitation
 b. solar radiation
 c. electric field
 d. kinetic energy of striking electrons *
136. Secondary electrons inside CRT are collected by
 a. aquadag * b. boron
 c. glass d. silver coating
137. A double beam oscilloscope has
 a. two screens
 b. two electron guns *
 c. two different phosphor coatings
 d. one waveform divided into two parts
138. In case the horizontal and vertical inputs to an oscilloscope are as shown in Fig. 1.6., the display on the screen will be as shown in

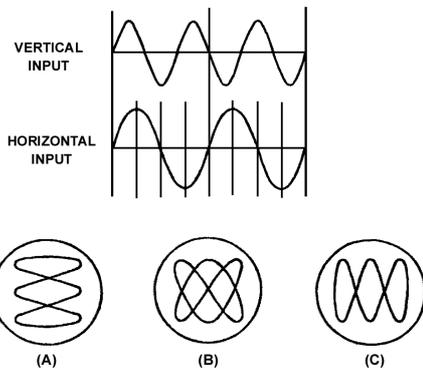


Fig. 1.6.

- a. Fig. 1.6 A b. Fig. 1.6 B *
 c. Fig. 1.6 C d. Fig. 1.6 D

139. In a delayed time base oscilloscope
 a. there are two time base generators *
 b. there are two guns
 c. aquadag is not needed
 d. sweep generator is inactive
140. Analog storage oscilloscopes are particularly useful for investigation of
 a. repetitive multiple event signals
 b. repetitive single-event signals

- c. non-repetitive single-event signals *
 d. non-repetitive multiple event signals
141. In CRO INT/EXT switch is provided to
 a. select SYNC control as input signal *
 b. select input to vertical terminal
 c. select input to horizontal terminal
 d. provide an internal signal to the vertical input
142. Which material is preferred for blue phosphorescence in CR tube ?
 a. Calcium tungstate *
 b. Zinc oxide
 c. Magnesium fluoride
 d. Calcium phosphate
143. Which phosphor is used for colour TV screens ?
 a. P₁ b. P₆ *
 c. P₁₄ d. P₁₉
144. Which phosphor gives very short persistence ?
 a. P₁ b. P₇
 c. P₁₅ * d. P₁₉
145. Which phosphor gives very long persistence ?
 a. P₅ b. P₁₁
 c. P₁₅ d. P₁₉ *
146. In case the horizontal and vertical inputs to oscilloscope are as shown in figure 1.7, the display on the screen will be as shown in
 a. Fig. 1.7 A b. Fig. 1.7 B
 c. Fig. 1.7 C d. Fig. 1.7 D *

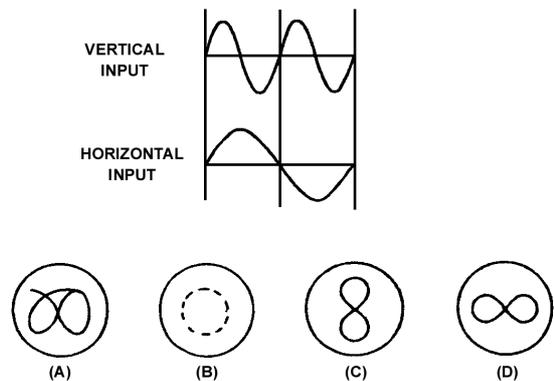


Fig. 1.7.

147. The phosphor materials used on the screen of an oscilloscope normally glow for a period of few
 a. seconds b. milliseconds *
 c. micro seconds d. nano seconds
148. When very low frequency signals are displayed, a short persistence screen will show
 a. the fly back effect
 b. loss of brightness
 c. a dot trace of waveform *
 d. thin line trace of waveform

149. A moving waveform on an oscilloscope can be made stationary by adjusting
- horizontal position control
 - vertical position control
 - coarse frequency control
 - SYNC-amplitude control *
150. A CRO is specified as 100 MHz. This figure of 100 MHz represents
- horizontal oscillation frequency of 100 MHz
 - sweep signal of 100 MHz *
 - vertical oscillator frequency of 100 MHz
 - none of the above
151. In a CRO, the sweep-width is controlled by
- focusing anode potential
 - accelerating anode potential
 - vertical gain control
 - horizontal gain control *
152. In case the horizontal and vertical inputs to a oscilloscope are as shoed in Fig. 1.8, the display on the screen will be as shown in

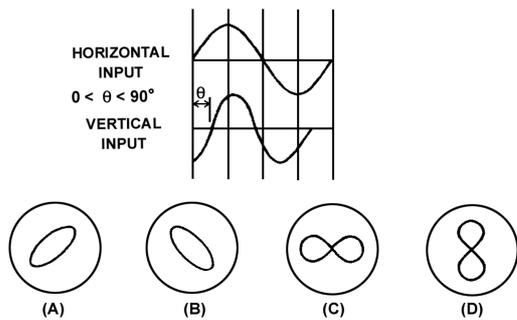


Fig. 1.8.

- Fig. 1.8 A *
 - Fig. 1.8 B
 - Fig. 1.8 C
 - Fig. 1.8 D
153. If the transients during switching of a power supply are to be studied, which oscilloscope will be preferred?
- An ordinary oscilloscope with high frequency sweep generator
 - Dual beam oscilloscope
 - Dual trace oscilloscope
 - Storage oscilloscope *
154. In a CRO, the deflection sensitivity of deflecting plates is
- directly proportional to sweep frequency
 - inversely proportional to sweep frequency
 - directly proportional to accelerating anode voltage
 - inversely proportional to accelerating anode voltage *
155. A delay line is used in high speed CRO to introduce time delay in
- vertical channel *

- horizontal channel
- in the Z-axis of the CR tube
- none of the above

156. In case the horizontal and vertical inputs to a oscilloscope are as shown in Fig. 1.9. the display on the screen will be as shown in
- Fig. 1.9 A
 - Fig. 1.9 B *
 - Fig. 1.9 C
 - Fig. 1.9 D
157. In storage oscilloscopes, callimeter is
- a metal film deposited around the neck of the tube*
 - a device to accelerate electrons to very high velocities
 - a device to facilitate quick retrace of the wave
 - none of the above

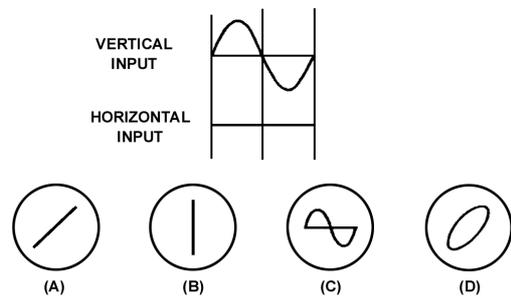


Fig. 1.9

158. In order to prevent loading of a circuit under test, the input impedance of a CRO must be
- inductive
 - capacitive
 - low
 - high *
159. In CRO negative high voltage power supply is needed to operate
- CR tube
 - circuit elements
 - tubes *
 - all of the above
160. If a spot on CR tube is left in one position for a longer time
- it may reduce the gain of amplifier
 - it may need refocusing
 - burn the screen of the tube *
 - the colour of fluorescence may change
161. The purpose of SYNC control in CRO is to
- focus the spot on the screen
 - set the intensity of the spot on the screen
 - lock the display of signal *
 - adjust the amplitude of the display
162. In case the horizontal and vertical inputs to a oscilloscope are as shown in Fig. 1.10. , the display on the screen will be as shown in
- Fig. 1.10 A
 - Fig. 1.10 B
 - Fig. 1.10 C
 - Fig. 1.10 D *

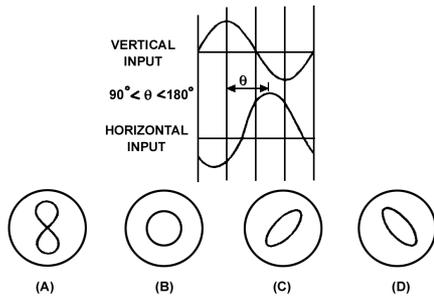


Fig. 1.10.

163. In analog storage oscilloscopes, the 'write gun' consists of
- low voltage cathodes
 - variable voltage cathodes
 - accelerating and deflecting electrodes *
 - none of the above
164. In analog storage oscilloscopes the two floods guns are
- simply cathodes heated to generate low energy electrons *
 - provided to further accelerate electrons
 - incorporated to minimize secondary emission
 - provide to facilitate deflection of beam
165. Phosphore coating on the screen of a cathode ray tube is provide
- on the inside face only *
 - on the outside face only
 - both inside as well as outside face
 - neither inside nor outside face
166. Red, blue or green glow on CR tube depends on
- frequency of wave
 - intensity of beam
 - persistence time
 - material of phosphorescence *
167. The phosphorescence colour preferred for radars, particularly for night applications, is
- orange *
 - blue
 - green
 - red
168. Material used for green colour fluorescence is
- Magnesium fluoride
 - Zinc orthosilicate *
 - Zinc sulphide
 - Calcium phosphate
169. In case the non-linear saw-toothed wave shown in Fig. 1.11. is applied to the horizontal deflection plates of CRO, the distorted sine wave produced will be as show in



Fig. 1.11.

- Fig. 1.11. A
- Fig. 1.11. B *
- Fig. 1.11. C
- Fig. 1.11. D



Fig. 1.12.

170. The length of the trace (sweep) on the CRT screen is controlled by
- SYNC control
 - trigger-level control
 - horizontal-gain control *
 - vertical-gain control.
171. In CRO astigmatism is
- a source of generating fast electrons
 - media for absorbing secondary emission electrons
 - an additional focusing central *
 - internal saw tooth voltage generator.

Question 172 to 176 refer to Fig. 1.13.

Various lissajous patterns on CRO screen are shown in Fig. 1.13. These patterns have been obtained for two sine wave voltages of the same frequency.

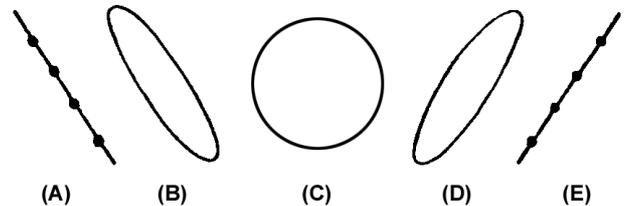


Fig. 1.13.

172. A Phase difference of zero degree is represented by
- Fig. 1.13 A
 - Fig. 1.13 B
 - Fig. 1.13 C *
 - Fig. 1.13 D
173. A phase difference of 10° is represented by
- Fig. 1.13 A
 - Fig. 1.13 B
 - Fig. 1.13 C *
 - Fig. 1.13 D
174. Figure 1.13 (A) represents the phase difference of
- 360°
 - 270°
 - 180° *
 - 10°
175. Figure 1.13 (D) represents the phase difference of
- 30°
 - 45° *
 - 60°
 - 120°
176. Which figure 1.13 represents phase difference of 30° ?
- Figure 1.13 A
 - Figure 1.13 B
 - Figure 1.13 C
 - None of the figures *

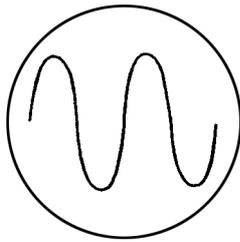


Fig. 1.14.

177. If a 50 Hz wave is synchronized and projected on screen as shown in figure, it can be concluded that
- the synchronizing voltage applied is too low
 - the synchronizing voltage applied is too high
 - the wave has been synchronized on 100 Hz sweep
 - the wave has been synchronized on 25 Hz sweep*

178. The input impedance of CRO is nearly
- zero
 - around 10 ohms
 - around 100 ohms
 - around one meg. ohm *
179. The time base of an oscilloscope is developed by
- square waveform *
 - pure sine waveform
 - saw tooth waveform
 - clock impulse
180. The cathode of Cathode Ray oscilloscope is usually coated with
- Copper oxide
 - Tungsten or thorium oxide
 - Barium or strontium oxide *
 - Alkali metals

181. Cathode rays can be deflected by
- electric field
 - magnetic field
 - both (a) and (b) above *
 - neither of above

182. A 100 MHz oscilloscope has
- 50 MHz sweep *
 - 50 MHz vertical oscillator
 - 50 MHz horizontal oscillator
 - 50 MHz supply voltage frequency

183. A cathode ray oscilloscope can be used to measure
- a.c. voltages only
 - d.c. voltages only
 - frequency
 - any of the above *

184. In case the non-linear saw-toothed wave shown in Fig. 1.15, is applied to the horizontal deflection plates of CRO. The distorted sine wave produced will be as shown in



Fig. 1.15.

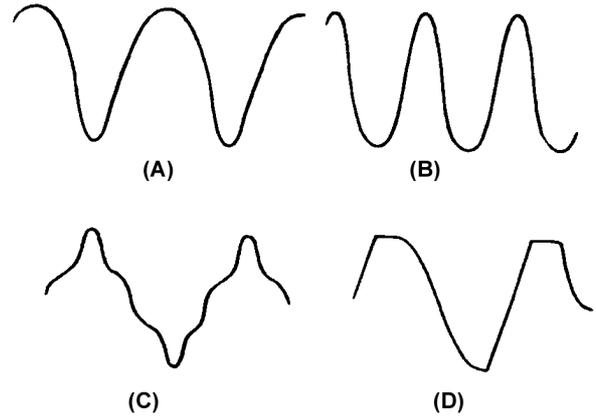


Fig. 1.16.

- Fig. A *
 - Fig. B
 - Fig. C
 - Fig. D
185. In case the retrace is visible on the CRO screen, it can be concluded that
- blanking control is not set properly *
 - accelerating anode has been given too high voltage
 - intensity is too high
 - there is loss of SYNC control signal
186. In a CRO a sine wave signal of unknown frequency is connected to the vertical terminals and a sine wave signal of 50 Hz frequency is connected to horizontal input. The lissajous pattern is as shown in Fig. 1.17. the unknown frequency will be

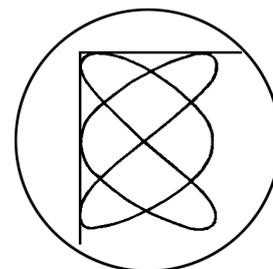


Fig. 1.17.

- $66\frac{2}{3}$
 - $33\frac{1}{3}$ *
 - 25
 - $16\frac{2}{3}$
187. In a CRO a sine wave signal of unknown frequency is connected to the vertical input terminals and sine wave signal of 50 Hz frequency is connected to horizontal input. The lissajous pattern is as shown in Fig. 1.18. The unknown frequency will be

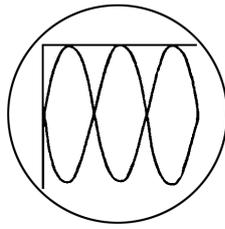


Fig. 1.18.

- a. $16\frac{2}{3}$ Hz
- b. 25 Hz
- c. $66\frac{2}{3}$ Hz
- d. 150 Hz *

188. Green screen for cathode ray tubes uses which of the following phosphor ?

- a. P_1^*
- b. P_4
- c. P_{22}
- d. P_{33}

189. Which phosphor number is used for television screens?

- a. P_1
- b. P_2
- c. P_3
- d. P_4^*

190. Phosphor number P_{19} is generally used for

- a. low frequency oscilloscopes
- b. radar indicators *
- c. fast photographic oscillography
- d. all of the above

191. Which of the following colour of screen has least persistence ?

- a. Bluish purple *
- b. Orange
- c. Blue green
- d. Blue white

192. Phosphor coating for cathode ray tubes is provided on

- a. inside surfaces only *
- b. outside surfaces only
- c. both the surfaces
- d. within the glass

193. If the lissajous pattern obtained on the screen is as shown in Fig. 1.19 the phase difference between two sine wave voltages is given by

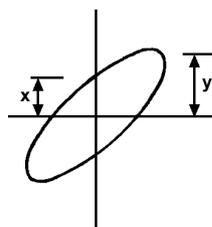


Fig. 1.19.

- a. $\sin^{-1} \frac{X}{Y}$ *
- b. $\sin^{-1} \frac{Y}{X}$
- c. $\tan^{-1} \frac{X}{Y}$
- d. $\tan^{-1} \frac{Y}{X}$

194. The lissajous pattern on CRO screen is as shown in Fig. 1.20. If the frequency applied to horizontal plate is 100 Hz, the frequency of the vertical plate will be

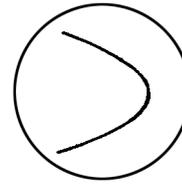


Fig. 1.20.

- a. 200 Hz
- b. 100 Hz
- c. 50 Hz *
- d. 33.3 Hz

195. The lissajous pattern on CRO screen is as shown in Fig. 1.21. If the frequency applied to horizontal plate is 100 Hz the frequency of vertical plate will be

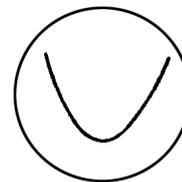


Fig. 1.21.

- a. 200 Hz *
- b. 100 Hz
- c. 50 Hz
- d. 25 Hz

196. In a CRO a sine wave signal of unknown frequency is connected to the vertical input terminals and a sine wave signal of 50 Hz is connected to horizontal input. The lissajous pattern is as shown in Fig. 1.22. The unknown frequency will be

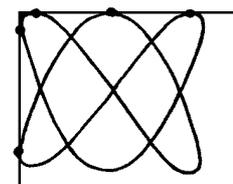


Fig. 1.22.

- a. 100 Hz
- b. 75 Hz *
- c. 25 Hz
- d. $12\frac{1}{2}$ Hz

197. The lissajous pattern produced by two sinusoidal voltages applied to X and Y plates is as shown in Fig. 1.23. The frequency ratio is

- a. 4 : 5 *
- b. 4 : 3
- c. 3 : 4
- d. 2 : 3

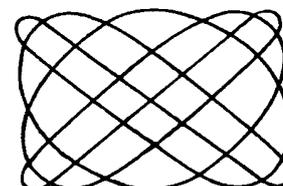


Fig. 1.23.

198. The lissajous pattern produced by two sinusoidal voltages applied to X and Y terminals is as shown in Fig. 1.24. The frequency ratio is
- 1 : 16
 - 1 : 8 *
 - 1 : 4
 - 3 : 4

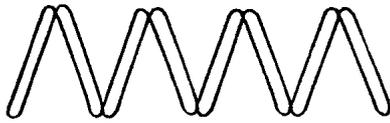


Fig. 1.24.

199. In a CRO a sine wave signal of unknown frequency is connected to the vertical input terminals and a sine wave signal of 50 Hz frequency is connected to horizontal input. The lissajous pattern is as shown in Fig. 1.25. The unknown frequency will be

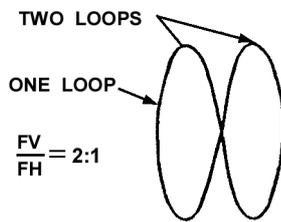


Fig. 1.25.

- 200Hz
 - 100 Hz *
 - 50 Hz
 - 25 Hz.
200. The CRO probe connects the circuit under investigation to
- SYNC - input terminal of CRO
 - horizontal input terminal of CRO *
 - vertical input terminal of CRO
 - none of the above
201. An ammeter is connected in with the circuits element whose current we wish to measure.
- series
 - Parallel *
 - series or parallel
 - none of the above
202. A galvanometer in series with a high resistance is called
- an ammeter
 - a voltmeter *
 - a wattmeter
 - none of the above
203. An ammeter should have resistance
- infinite
 - very large
 - very low *
 - none of the above
204. A voltmeter is connected in with the circuits component across which potential difference is to be measured
- parallel *
 - series
 - series or parallel
 - none of the above
205. A voltmeter should have resistance.
- zero
 - very high *
 - very low
 - none of the above
206. The sensitivity of a multimeter is given in
- W
 - amperes
 - kW/V *
 - none of the above
207. If the full-scale deflection current of a multimeter is 50mA, its sensitivity is
- 10kW/V
 - 100kW/V
 - 50kW/V
 - 20 kW/V *
208. If a multimeter has a sensitivity of 1000 W per volt and reads 50 V full scale, its internal resistance is
- 20kW
 - 50kW *
 - 10kW
 - none of the above
209. A VTVM has input resistance than that of a multimeter.
- more *
 - less
 - same
 - none of the above
210. The input resistance of a VTVM is about
- 1000 W
 - 10kW
 - 20kW
 - 10 MW *
211. If the negative potential on the control grid of CRT is increased, the intensity of spot
- is increased
 - is decreased *
 - remains the same
 - none of the above
212. For display of signal pattern voltage is applied to the horizontal plates of a CRO.
- sinusoidal
 - rectangular
 - sawtooth *
 - none of the above
213. Two multimeters A and B have sensitivities of 10 kW/V and 30kW/V respectively. Then
- multimeter A is more sensitive
 - multimeter B is more sensitive *
 - both are equally sensitive
 - none of the above
214. A galvanometer of resistance G is shunted by a very small resistance S. The resistance of the resulting ammeter is
- $\frac{GS}{G+S}$ *
 - G + S
 - G - S
 - none of the above
215. A VTVM is never used to measure
- voltage
 - current *
 - resistance
 - none of the above
216. The sensitivity of a voltmeter which uses a 100 mA meter movement is
- 1kW/V
 - 10 kW/V *
 - 5kW/V
 - date insufficient
217. What is the total resistance of a voltmeter on the 10 V range when the meter movement is rated for 50 mA of full-scale current ?

CHAPTER - 18

KNOWLEDGE OF FUNCTION PERFORMED AND OVERALL OPERATION OF MICROPROCESSOR

1. A computer designed using the microprocessor is called:
 - a. Mini computer
 - b. Micro computer *
 - c. Main frame computer
 - d. None
2. Computer has a fixed set of instruction in the form of binary pattern called:
 - a. Machine language *
 - b. Assembly language
 - c. High level language
 - d. None
3. The physical component of computer are called:
 - a. Hardware *
 - b. Software
 - c. Both
 - d. None
4. A group of program is called:
 - a. Software *
 - b. Hardware
 - c. Both
 - d. None
5. 1 byte equal to:
 - a. 8 bit *
 - b. 16 bit
 - c. 4 bit
 - d. None
6. 1 Nibble equal to:
 - a. 8 bit
 - b. 16 bit
 - c. 4 bit *
 - d. Above all
7. 1 K byte equal to:
 - a. 1024 bit
 - b. 2^{10} bit
 - c. Both *
 - d. None
8. 1 M byte equal to:
 - a. 2^{20} bit *
 - b. 2^{30} bit
 - c. 2^{40} bit
 - d. None
9. 1 G byte equal to:
 - a. 2^{30} bit *
 - b. 2^{40} bit
 - c. 2^{15} bit
 - d. 1024 bit
10. Keyboard & printer are:
 - a. I/p & o/p device respectively *
 - b. O/p & I/p device respectively
 - c. Both
 - d. None
11. ALU abbreviated as:
 - a. Arithmetic Logic Unit *
 - b. Automatic Logic Unit
 - c. Automatic Local Unit
 - d. None
12. ALU performs:
 - a. Arithmetic & Logical operation *
 - b. Control operation
 - c. Both
 - d. None
13. CPU consist of:
 - a. ALU
 - b. CU
 - c. Both 'a' & 'b' *
 - d. None
14. The CPU abbreviated as:
 - a. Central processing unit *
 - b. Control process unit
 - c. Control protection unit
 - d. Above all
15. mp is a - (m p = Microprocessor):
 - a. Semiconductor device *
 - b. Insulation device
 - c. Conducting device
 - d. None
16. m p consist for:
 - a. LSI
 - b. VLSI
 - c. Both 'a' & 'b' *
 - d. None
17. VLSI stands for:
 - a. Very large scale Integration *
 - b. Various large scale
 - c. Various large scale Integrity
 - d. None
18. The m p is similar to:
 - a. CPU *
 - b. ALU
 - c. CU
 - d. None
19. _____ include all the logic CKT (including CU) on one chip:
 - a. Microprocessor *
 - b. ALU
 - c. CU
 - d. None
20. Arithmetic operation performed by:
 - a. CU
 - b. ALU *
 - c. Both
 - d. None
21. Timing and control signal to all the operation by:
 - a. CU *
 - b. ALU
 - c. Register unit
 - d. None
22. RAM is basically:
 - a. Volatile memory *
 - b. Nonvolatile memory
 - c. Both
 - d. None
23. ROM is basically:
 - a. Volatile memory
 - b. Nonvolatile memory *
 - c. Both
 - d. None

24. RAM is used:
 a. Read/write memory * b. Read only memory
 c. Both d. None b. Decode, Fetch, Execute
 c. Execute, Decode, Fetch
 d. None
25. Read only not write by:
 a. RAM b. ROM *
 c. Both d. None
26. ASCII stands for:
 a. American standard code for information interchange*
 b. Automatic standard code for information interchange
 c. American standard conversion for information interchange
 d. None
27. Which is not o/p device:
 a. CRT b. Printer
 c. Keyboard * d. LEDS
28. The translation of source code into m/c code by:
 a. Interpreter b. Compiler
 c. Both 'a' & 'b' * d. None
29. _____ reads the entire programme first and then generates the object code:
 a. Interpreter b. Compiler *
 c. Both d. None
30. Interpreter reads _____ at a time:
 a. One instruction * b. Whole instruction
 c. No instruction d. Above all
31. 8085 have communication lines:
 a. Address bus b. Data bus
 c. Control bus d. Above all *
32. 8085 have _____ address lines:
 a. 10 b. 16 *
 c. 8 d. 12
33. Address bus is:
 a. Bidirectional b. Unidirectional *
 c. Both d. None
34. 8085 MPU with its 16 address lines is capable of addressing:
 a. 2^{18} b. 2^{16} *
 c. 2^{14} d. 2^8
35. The 8005 MPU have _____ data bus:
 a. 16 b. 8 *
 c. 10 d. 12
36. The I/P device is:
 a. LEDS b. Seven symbol LEDS
 c. ASCII keyboard * d. None
37. Sequence of operation of m p:
 a. Fetch, Decode, Execute * b. Decode, Fetch, Execute
 c. Execute, Decode, Fetch
 d. None
38. 8085 m p is:
 a. 8 bit word length * b. 16 bit
 c. 32 bit d. None
39. Hexadecimal number stands:
 a. 16 * b. 10
 c. 8 d. None
40. In microprocessor (m p) language used:
 a. Assembly language *
 b. High level
 c. Machine language
 d. None
41. Mnemonic is related to:
 a. High level language
 b. Low level language
 c. Assembly level language *
 d. None
42. High level language are:
 a. FORTRAN b. BASIC
 c. PASCAL d. Above all *
43. COBOL is basically:
 a. Low level language
 b. High level language *
 c. Assembly level language
 d. None
44. In 8085 data bus are _____ .
 a. Unidirectional b. Bidirectional *
 c. Both 'a' & 'b' d. None
45. 8085 consist of _____ control line:
 a. 8 * b. 16
 c. 14 d. None
46. 8085 have _____ general purpose register:
 a. 6 * b. 8
 c. 4 d. None
47. The accumulator is _____ bit register:
 a. 6 b. 8 *
 c. 4 d. 10
48. There are _____ flags are in 8085 m p:
 a. 5 * b. 4
 c. 8 d. None
49. Programme counter and stack pointer are:
 a. 16 bit register * b. 8 bit register
 c. 14 bit register d. None
50. _____ is used to sequence execution of programme:
 a. Programme counter * b. Stack pointer
 c. Both d. None

51. 32 H can be represented as:
 a. 00110010 * b. 00100100
 c. 01000100 d. 00010001
52. 01010001 is represented:
 a. 47H b. 51 H *
 c. 62H d. None
53. By Add Instruction 47 H & 51 H, the carry flag will be:
 a. Set b. Reset *
 c. Both d. None
54. By Add Instruction 47 M & 51 M, the sign flag will be:
 a. Set * b. Reset
 c. Both d. None
55. By Add Instruction 47 M & 51 M, the zero flag will be:
 a. Set b. Reset *
 c. Both d. None
56. If the number of 1's are even the parity flag will:
 a. Set * b. Reset
 c. Both d. None
57. If the number of 1's are odd the parity flag will:
 a. Set b. Reset *
 c. Both d. None
58. For +ve value the Sign flag represented by:
 a. 0 * b. 1
 c. Both d. None
59. For -ve value the sign flag represented by:
 a. 0 b. 1 *
 c. Both d. None
60. When there is carry from one nibble to another nibble the auxiliary carry will be:
 a. Set * b. Reset
 c. Both 'a' & 'b' d. None
61. For 10011000 the parity flag will be:
 a. Set b. Reset *
 c. Both d. None
62. The instruction ADI is _____ instruction:
 a. 3 byte b. 2 byte *
 c. Single byte d. None
63. The machine cycle of ADI will be:
 a. 2 * b. 3
 c. 4 d. 1
64. The accumulator contains 4 AH & add the data byte 59 H to content of accumulator which representation is correct:
 a. ADI 4 AH b. ADI 59 H *
 c. Both d. None
65. Accumulator contains - 4 AH, Add data byte-59 H to the content of accumulator, the position of sign flag will be:
 a. 1 * b. 0
 c. Both d. None
66. Accumulator contains - 4 AH, Add data byte-59 H to the content of accumulator, the position of zero flag will be:
 a. Set b. Reset *
 c. Both d. None
67. Auxilliary carry will be:
 a. Set * b. Reset
 c. Both d. None
68. Accumulator contains - 4 AH, Add data byte-59 H to the content of accumulator, the position of parity flag will be:
 a. Set b. Reset *
 c. Both d. None
69. Accumulator contains - 4 AH, Add data byte-59 H to the content of accumulator, the position of carry flag will be:
 a. Set b. Reset *
 c. Both d. None
70. Which instruction is used to logically AND with accumulator:
 a. ANA * b. ANI
 c. AND d. None
71. The correct representation if we want to logically AND data 97 H, with content of accumulator A3 H:
 a. ANI 97 H * b. ANI A3 H
 c. Both d. None
72. How many machine cycle of AND immediate with accumulator:
 a. 2 * b. 4
 c. 3 d. 1
73. CALL instruction is _____ byte:
 a. 2 b. 3 *
 c. 4 d. 1
74. CALL 2050, which byte is entered first:
 a. Low order * b. High order
 c. Both d. None
75. CMA 89 H will give
 a.

0	1	1	1	0	1	1	0
---	---	---	---	---	---	---	---

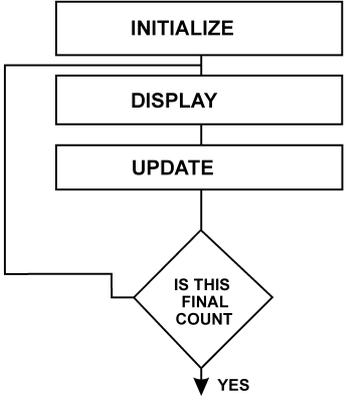
 *
 b.

1	0	0	1	0	1	1	1
---	---	---	---	---	---	---	---

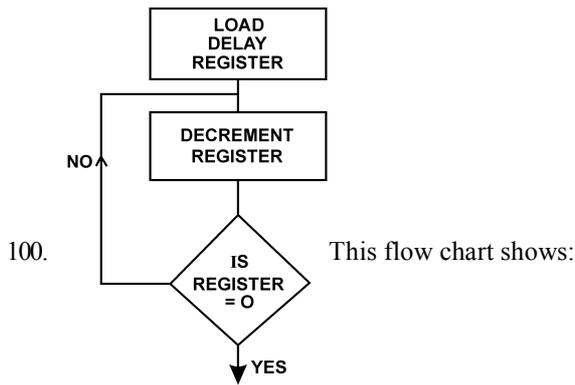
 c.

0	1	0	1	0	0	0	1
---	---	---	---	---	---	---	---

 d. None

76. If A < register / memory carry flag will be:
 a. Set * b. Reset
 c. Both d. None
77. If A > register / memory carry flag will be:
 a. Set b. Reset *
 c. Both d. None
78. If A = register / memory zero flag will be:
 a. Set * b. Reset
 c. Both d. None
79. 39 in BCD is represented as:
 a. 00111001 * b. 00110001
 c. 10010010 d. None
80. If we add $39_{BCD} + 12_{BCD}$, the result will be:
 a. 4C b. 4B *
 c. 3C d. 3B
81. For loading the BC pair with 2475, the instruction will be:
 a. LXI B, 2475 H * b. MV 1 B, 2475 H
 c. Both d. None
82. In 8085 interrupt, which have higher priority:
 a. TRAP * b. INTR
 c. RST 7.5 d. None
83. In 8085 interrupt, which have lowest priority:
 a. TRAP b. INTR *
 c. RST 7.5 d. None
84. Which interrupt is not disable by DI instructic:
 a. RST 7.5 b. INTR
 c. TRAP * d. Above all
85. If D contain FF H by INR D, the result will be:
 a. D contain 00 H * b. D contain F1 H
 c. D contain -1F H d. None
86. For incrementing resister pair by one the instruction will be:
 a. INX * b. INR
 c. Both d. None
87. JMP (Jump unconditionality) is _____ byte instruction:
 a. 2 b. 3 *
 c. 1 d. None
88. Load accumulator indirect LDAX is _____ byte instruction:
 a. Single * b. 2
 c. 4 d. None
89. Load H-L pair direct by:
 a. LHLD * b. SHLD
 c. Both d. None
90. Store H-L pair direct by:
 a. LHLD b. SHLD *
 c. PCH d. None
91. Store accumulator direct by:
 a. LDA b. STA *
 c. LDAX d. STAX
92. XCHG is used for:
 a. Exchange H & L with D & E *
 b. Exchange B-C with DE
 c. Both
 d. None
93. Which instructions is used to clear the accumulator:
 a. ORX b. XRA *
 c. ORI d. None
94. TRAP interrupt are:
 a. Maskable Interrupt
 b. Non Maskable *
 c. Both
 d. None
95. RST, 7.5, 6.5 & 5.5 are:
 a. Maskable Interrupt *
 b. Non Maskable
 c. Both
 d. None
96. Maskable Interrupt are enable under programme with:
 a. EI b. SIM
 c. Both * d. None
97. DCX & INX are:
 a. Affect the flag b. Do not affect the flag *
 c. Both d. None
98. DOWN counter counts:
 a. Ascending order b. Descending order *
 c. Both d. None
99. The flowchart of a:


 a. Counter * b. Time delay
 c. Machine cycle d. T-state



- a. Counter
- b. Time delay *
- c. Machine cycle
- d. T-state

101. In 8085 Accumulator is _____ register:
- a. 8 *
 - b. 4
 - c. 16
 - d. None
102. _____ is the part of Arithmetic logic unit:
- a. Flags
 - b. Accumulator *
 - c. Stack pointer
 - d. None
103. Result of operation is stored in:
- a. Accumulator *
 - b. Flag
 - c. Stack pointer
 - d. Program counter
104. Accumulator is also identified as:
- a. B Register
 - b. C Register *
 - c. D Register
 - d. A Register
105. In 8085 have following:
- a. 5 Flags *
 - b. 10 Flags
 - c. 6 Flags
 - d. None
106. Flag registers are:
- a. 8 bit *
 - b. 16 bit
 - c. 10 bit
 - d. 5 bit
107. Which is correct representation of Flag:
- a.

S	Z	AC	P	CY
---	---	----	---	----

 *
 - b.

Z	S	AC	P	CY
---	---	----	---	----
 - c.

AC	Z	P	CY	S
----	---	---	----	---
 - d. None
108. The term PSW refers to:
- a. Accumulator & Flag register *
 - b. B-C register
 - c. DE register
 - d. H-L register
109. PC (Programme Counter) is _____ register:
- a. 8 bit
 - b. 16 bit *
 - c. 10 bit
 - d. None

110. Sequencing & execution of instruction by:
- a. Stack pointer
 - b. Programme counter *
 - c. Accumulator
 - d. Flags
111. Stack pointer is _____ register:
- a. 8 bit
 - b. 16 bit *
 - c. 14 bit
 - d. None
112. 2^{16} is equivalent to:
- a. 65536
 - b. 64 K
 - c. Both 'a' & 'b' *
 - d. None
113. RAM is:
- a. Volatile *
 - b. Nonvolatile
 - c. Both
 - d. None
114. Static memory is made of:
- a. Flip-Flop *
 - b. MOS transistor gate
 - c. Both
 - d. None
115. Dynamic memory is made of:
- a. Flip-Flop
 - b. MOS transistor gate *
 - c. Both
 - d. None
116. ROM is:
- a. Volatile memory
 - b. Nonvolatile memory *
 - c. Both
 - d. None
117. The information stored semipermanent:
- a. PROM
 - b. EPROM *
 - c. EEPROM
 - d. None
118. 8 address lines are used to send the I/o by:
- a. Direct I/o
 - b. Peripheral I/o *
 - c. Both
 - d. Memory mapped I/o
119. 16 address lines are used to send the I/o by:
- a. Direct I/o
 - b. Peripheral I/o
 - c. Both
 - d. Memory mapped I/o *
120. A Latch is a:
- a. D Flip-Flop *
 - b. RS Flip-Flop
 - c. J-K Flip-Flop
 - d. T Flip-Flop
121. MOV instructions is kept in following:
- a. Data transfer *
 - b. Arithmetic
 - c. Logical
 - d. H/C control
122. MOV is _____ byte instruction
- a. Single *
 - b. 2
 - c. 3
 - d. None
123. MOV instructions is used to data transfer b/w:
- a. Register to Register *
 - b. Memory to Register
 - c. Both 'a' & 'b'
 - d. None
124. Copy the content of the accumulator is register C is:
- a. MOV C, A *
 - b. MOV A, C
 - c. Both
 - d. None

125. MVI is abbreviated as:
 a. Move immediately * b. Move important
 c. Move ignore d. Above all
126. 2 byte instruction is:
 a. ADD b. MOV
 c. CMA d. MVI *
127. MVI is used b/w:
 a. Register to register b. Data to register *
 c. Both d. None
128. 3 byte instruction is:
 a. MVI b. ADD
 c. CMA d. JMP *
129. Which is not arithmetic operation:
 a. ADD b. SUB
 c. AND * d. INC
130. The logical operation are:
 a. AND b. OR
 c. XOR d. Above all *
131. The 8085 mp have the memory:
 a. 64 K * b. 124 K
 c. 128 K d. 32 K
132. The 8085 up have ____ pin package:
 a. 40 * b. 80
 c. 30 d. None
133. ALE is abbreviated as:
 a. Arithmetic logic enable
 b. Address latch enable *
 c. Automatic latch enable
 d. None
134. CLOCK frequency of 8085 up is:
 a. 3 MHz * b. 4 MHz
 c. 5 MHz d. 2 MHz
135. The 8085 have ____ interrupt signal:
 a. 5 * b. 6
 c. 4 d. None
136. Highest priority is given to:
 a. TRAP * b. INTR
 c. RST 7.5 d. RST 5.5
137. TRAP inturrup is:
 a. Maskable b. Nonmaskable *
 c. Both d. None
138. INTR interrupt have:
 a. Highest priority b. Lowest priority *
 c. Medium d. Above all
139. INTR interrupt is:
 a. Maskable * b. Nonmaskable
 c. Both 'a' & 'b' d. None
140. The preority order of RST 7.5, 6.5 & 5.5 are:
 a. RST 7.5, 5.5, 6.5 b. RST 7.5, 6.5, 5.5 *
 c. RST 5.5, 7.5, 6.5 d. None
141. Halt intstruction is kept into:
 a. Data transfer operation
 b. Branching operation
 c. Machine control operation *
 d. Logical operation
142. In _____ fetch & execute of instruction is:
 a. Machine cycle b. Instruction cycle *
 c. T state d. None
143. The time required to complete the execution of an instruction:
 a. Machine cycle b. Instruction cycle *
 c. T state d. None
144. Which instruction is used for copy data from source register Rs into destination register Rd:
 a. MOV * b. MVI
 c. Both d. None
145. For loading 8 bit data in a register:
 a. MOV b. MVI *
 c. Both d. None
146. For copy the data byte into the accumulator from the memory location indicated by a register pair:
 a. LDAX * b. LDA
 c. STAX d. STA
147. For copy the data byte into the accumulator from the memory location specified by 16 bit address:
 a. LDAX b. LDA *
 c. STAX d. STA
148. For ADD the content of the register to the content of accumulator:
 a. ADD * b. ADI
 c. Both d. None
149. Which instruction to be used for add 8 bit data to the content of accumulator:
 a. ADD b. ADI *
 c. Both d. None
150. Logically AND the 8 bit data with the content of accumulator following is correct:
 a. ANA b. ANI *
 c. ORA d. ORI
151. In 8085 TRAP is:
 a. Always maskable
 b. Cannot Inturrup a service sub routine
 c. Used for Catastrophic events like temporary faliure*
 d. Lowest Priority

152. TRAP is _____ whereas RST 7.5, 6.5, 5.5 are _____:
- Maskable, Nonmaskable
 - Maskable, Maskable
 - Nonmaskable, Nonmaskable
 - Nonmaskable, Maskable *
153. In 8085 to disable the whole interrupts system (Except TRAP):
- The DI instruction may used *
 - The D 0 instruction may used
 - The interrupt instruction may used
 - The E 1 instruction may used
154. The content stack location 2109 H after the CALL operation:
- 00100000 *
 - 01000000
 - 10000000
 - 00010000
155. The content of stack location 2100 H after the CALL operation:
- 00000111 *
 - 00001110
 - 00001010
 - 00001111
156. In 8085 how many interrupt control lines are there:
- 6 *
 - 8
 - 12
 - 16
157. What is the length of A register:
- 6 bit
 - 8 bit *
 - Both
 - None
158. What is the length of instruction register:
- 6 bit
 - 8 bit *
 - 12 bit
 - 16 bit
159. What is the length of programme counter:
- 6 bit
 - 8 bit
 - 12 bit
 - 16 bit *
160. What is the length of stack pointer is:
- 6 bit
 - 8 bit
 - 12 bit
 - 16 bit *
161. What is the length of status word:
- 6 bit
 - 8 bit
 - 12 bit
 - 16 bit *
162. In 8085 how many interrupt are there:
- 4
 - 5 *
 - 6
 - 7
163. What is the memory word addressing capability:
- 32K
 - 64 K *
 - 256K
 - 512 K
164. In 8085 how many I/o parts can be accessed by direct method:
- 8
 - 256 *
 - 32K
 - 64K
165. In 8085 how many I/o part can be accessed by memory mapped method:
- 8
 - 256
 - 32 K *
 - 64 K
166. If interrupt service request have been recieved from all of the following interrupts, then which one will be serviced first:
- RST 5.6
 - RST 6.5
 - RST 7.5 *
 - RST 5.7
167. Which of the following are vectored interrupts:
- RST 5.5
 - RST 6.5
 - RST 7.5
 - All *
168. What will accumulator (A) and carry (CY) contain after ANA A: [Asuming accumulator contains of A-6 H CY is set 1]
- A 6 H, 1
 - A 6 H, 0 *
 - 00 H, 0
 - 00 H, 1
169. What will register (A) and carry after ORA A:
- A 6 H, 1
 - A 6 H, 0 *
 - 00 H, 0
 - 00 H, 1
170. What will be register (A) and CY contain after XRA A: [Asuming accumulator contains of 6 H CY is set 1]
- A 6 H, 1
 - A 6 H, 0
 - 00 H, 0 *
 - 00 H, 1
171. What will register A & CY after ADI 0 AH: [Asuming accumulator contains of 6 H CY is set 1]
- B 0 H, 0 *
 - B 0 H, 1
 - C 0 H, 0
 - C 0 H, 1
172. What is the addressing mode used in intruction MOV M, C:
- Direct
 - Indirect *
 - Induced
 - Immediate
173. What is the addressing mode in LDA 0345 H:
- Direct *
 - Indirect
 - Indened
 - Immediate
174. What is addressing mode used in instruction LX 1 B 0345H:
- Direct
 - Indirect
 - Immidiata *
 - Indened
175. The first m/c cycle of an instruction is always:
- A memory read cycle
 - A fetch cycle *
 - A I/o real cycle
 - A memory write cycle
176. How many and what are the m/c cycles needed for execution of MOV A, M:
- 1, Fetch
 - 2, Fetch & memory read *
 - 2, Fetch & memory write
 - 2, Fetch & Bus idle

177. Which of the following interrupts is unmaskable interrupts:
 a. RST 5.5 b. RST 7.5
 c. TRAP d. INTR *
178. Instruction RST is written in a program, the program will jump to location:
 a. 0020H b. 0024H
 c. 0028H * d. 002cH
179. When TRAP interrupt is triggered program control is transferred to location:
 a. 0020H b. 0024H
 c. 0028H d. 002cH *
180. Even after a reset operation which of the following interrupts remain enable:
 a. INTR b. RST 5.5
 c. RST 7.5 d. TRAP *
181. In order to enable RST 5.5, 6.5 & 7.5 interrupts, which of the following instruction are needed:
 a. EI only b. SIM only
 c. EI & SIM * d. None
182. In order to enable interrupt which of the following instruction are needed:
 a. EI only * b. SIM only
 c. EI & SIM only d. None
183. In order to enable TRAP will of the following interrupt are required:
 a. EI only b. SIM only
 c. EI & SIM only d. None *
- A = 3EH, B = 27H, C = 4FH, H = 00H, L = 0FFH
 Memory location 00EE & 00FFH contain 2DH & 4EH respectively.
 The following program begins at memory location 0110H:
 ADD C
 DAA
 MOV B, M
 MOV M, A
 DADB
184. What A will contain after the instruction:
 a. 5EH b. 4EH
 c. ADH d. 13H *
185. B will contain after instruction:
 a. 5EH b. 4EH *
 c. 27H d. 2DH
186. H will contain after instruction:
 a. 00H b. 28H *
 c. 4EH d. FFH
187. What L will contain after instruction:
 a. 00H b. 28H
 c. 4EH * d. FFH
188. What will be content of memory location 00FFH after the instruction:
 a. 2DH b. 4EH *
 c. 13H d. 28H
189. What will be content PC after the instruction:
 a. 00FEH b. 0114H
 c. 0115H * d. 0119H
190. What is the value of CY & AC after DAD instruction:
 a. 0,0 b. 0,1
 c. 1,0 d. 1,1 *
191. Which of the following register pair can be stored directly:
 a. BC b. DE
 c. HL * d. None
192. Microprocessor can be of
 a. 8 bit only b. 16 bit only
 c. 8 bit, 16 bit or 32 bit * d. 32 bit only
193. Intel 4004 & 8008 microprocessor are
 a. First generation microprocessors *
 b. Second generation microprocessors
 c. Third generation microprocessors
 d. Fourth generation microprocessors
194. The microprocessor
 a. Reads program instruction
 b. executes program instruction
 c. reads & executes program instruction *
 d. none of the above
195. Microcomputer's CPU consists of many components which are integrated into one unit known as
 a. Address bus b. Control bus
 c. Data bus d. microprocessor *
196. Microprocessor consist of
 a. Register and ALU
 b. Timing & control unit and flags
 c. Instruction decoder and interrupt control unit
 d. All of the above *
197. ALU can perform
 a. Binary addition & subtraction only
 b. Logical AND, OR, XOR
 c. Complement
 d. All of the above *
198. The 8085 is a general purpose _____ bit microprocessor
 a. 4 bit b. 8 bit *
 c. 16 bit d. 32 bit
199. 8085 microprocessor is capable of addressing upto
 a. 8 k bytes b. 16 k bytes
 c. 32 k bytes d. 64 k bytes *
200. Precisely $2^{16} =$

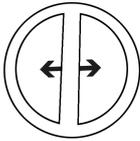
- a. 65536 bytes * b. 56556 bytes
c. 56356 bytes d. 66553 bytes
201. Design for 8085 A microprocessor has been derived from its predecessor
a. 4040 A b. 8080 A *
c. 8085 A d. None of the above
202. Programms written for 8080 A
a. can run on 8085 A with modification
b. can not run on 8085 A
c. can run on 8085 A without any modification *
d. None of the above
203. 8085 A microprocessor has
a. 4 bit ALU b. 8 bit ALU *
c. 16 bit ALU d. 32 bit ALU
204. 8085 microprocessor has
a. 47 basic instruction b. 74 basic instruction *
c. 57 basic instruction d. 75 basic instruction
205. Following is / are the microcomputer programming language / languages
a. Machine Language b. assembly language
c. high level language d. all of the above *
206. Address bus is a link between
a. Data bus and control bus
b. microprocessor and memory chips *
c. microprocessor and data bus

n n n

CHAPTER - 19

KNOWLEDGE OF HANDLING OF MICRO ELECTRONIC SENSITIVE DEVICE (ESD)

1. While a person walking on air carpet, rubbing his hair accumulates electrostatic charge of:
 - a. 1000 volt *
 - b. 2000 volt
 - c. 10,000 volt
 - d. None
2. What is typical voltage while walking across carpet:
 - a. 35,000 volt *
 - b. 30,000 volt
 - c. 15,00 volt
 - d. 1200 volt
3. What is meaning of ESDS devices:
 - a. Electrostatic discharge sensitive device *
 - b. Electrostatic demand sensitive device
 - c. Electrostatic discharge super device
 - d. None
4. The air in the shop should be dry and have a relative humidity of:
 - a. 40% to 60% *
 - b. 60% to 80%
 - c. 100% to 110%
 - d. None
5. The ESDS symbols is:



a.



b. *



c.

d. All above
6. The symbol of “ATTENTION ELECTROSTATIC GROUNDJACK”:
 - a. €
 - b. ☐ *
 - c. ¥
 - d. None
7. Walking over vinyl floor generate:
 - a. 12,000 volt *
 - b. 35,000 volt
 - c. 6,000 volt
 - d. 25,000 volt
8. Workout bench generate the voltage:
 - a. 6,000 volt *
 - b. 7,000 volt
 - c. 20,000 volt
 - d. 18,000 volt
9. While precaution to be taken in the shop the floor area in front of working bench should have:
 - a. Conductive mat *
 - b. Insulator mat
 - c. Both
 - d. None
10. Electrostatic Static devices must never be stored along side:
 - a. Nonelectrostatic devices *
 - b. Electrostatic devices
 - c. Both
 - d. None
11. ESDS components must be packed in:
 - a. Conductive material *
 - b. Nonconductive material
 - c. Both
 - d. None
12. A metal rack/cupboard should be:
 - a. Grounded *
 - b. Non Grounded
 - c. Both
 - d. None'
13. While working on ESDS devices avoid wearing of dress made of:
 - a. Nylon *
 - b. Cotton
 - c. Silk
 - d. None

CHAPTER - 20

ELEMENTARY KNOWLEDGE OF COMPUTER

1. The input unit of a computer
 - a. feeds the data in CPU
 - b. retrieves the data from CPU *
 - c. directs all other units
 - d. all of these
2. The control unit of a computer
 - a. perform arithmetic and logical operation on the data
 - b. controls the operation of output devices
 - c. is a device for manually operating the computer
 - d. directs the other units of the computer *
3. A CPU generally contains
 - a. registers and ALU
 - b. a control and timing section
 - c. instruction decoding circuit
 - d. all of these *
4. Which of the following computers is least powerful ?
 - a. minicomputer
 - b. microcomputer *
 - c. mainframe computer
 - d. super computer
5. Which of the following storage devices can be carried around ?
 - a. floppy disks *
 - b. main memory
 - c. registers
 - d. core memory
6. Which of the following coded entries are used to control access to computers ?
 - a. code words
 - b. pass words *
 - c. binary pass
 - d. ASC-II code
7. The hardware unit which is used to monitor computer processing is
 - a. console *
 - b. dot matrix printer
 - c. mouse
 - d. ROM
8. Hard copy of a document can be obtained from
 - a. card reader
 - b. CRT
 - c. Laser printer *
 - d. paper tape
9. Which of the following is the internal memory of the computer ?
 - a. CPU register
 - b. cache
 - c. main memory
 - d. all of these *
10. The heart of any computer is the
 - a. CPU *
 - b. memory
 - c. I/O units
 - d. disks
11. Which of the following memories is capable of operating at electronic speed ?
 - a. semiconductor memory *
 - b. magnetic disks
 - c. magnetic drums
 - d. magnetic tapes
12. Which of the following is responsible for coordinating various operations using timing signals ?
 - a. arithmetic logic unit
 - b. control unit *
 - c. memory unit
 - d. input/output unit
13. The ALU of a computer normally contains a number of high speed storage elements called
 - a. semiconductor memory
 - b. registers *
 - c. hard disk
 - d. magnetic disk
14. Which of the following is the fastest ?
 - a. CPU *
 - b. magnetic tapes and disks
 - c. video terminals
 - d. sensors, mechanical controllers
15. The register which contain the instruction to be executed is called
 - a. instruction register
 - b. index register *
 - c. memory address register
 - d. memory data register
16. The register which keeps track of the execution of a program and which contains the memory address of the instruction currently being executed is called
 - a. index register
 - b. memory address register
 - c. program counter *
 - d. instruction register
17. The register which holds the address of the location to or from which data are to be transferred is known as
 - a. index register
 - b. instruction register
 - c. memory address register *
 - d. memory data register
18. The register which contains the data to be written into or read out of the addressed location is known as
 - a. index register
 - b. memory address register
 - c. memory data register *
 - d. program counter
19. Which of the following is used as storage locations both in the ALU and the control section of a computer ?

- a. accumulator b. register *
- c. adder d. decoder
20. A device or peripheral equipment which is not in direct communication with CPU of a computer is known as
- a. on-line device b. off-line device *
- c. channel d. intelligent terminal
21. How many units in a single bus structure communicate at a time ?
- a. one b. two *
- c. three d. four
22. A single bus structure is primarily found in
- a. main frames
- b. super computers
- c. high performance machines
- d. mini and micro - computers *
23. The unit of a computer system which executes program, communicates with and often controls the operation of other subsystems of the computer is the
- a. CPU * b. control unit
- c. I/O unit d. peripheral unit
24. A beam of light used to record and retrieve data on optical disk is known as
- a. polarized light b. unpolarized light
- c. laser * d. coloured light
25. Computer peripheral is
- a. a computer device which is not connected to CPU
- b. a device which is connected to CPU *
- c. a device for manually operating the computer
- d. none of these
26. The ability of medium sized computer system to increase its data processing capability by the substitution of large and more efficient computer devices is known as
- a. computer expendability
- b. computer nobility *
- c. upward compatibility
- d. computer enhancement
27. The ability of a medium sized computer to increase in data processing capability by addition of such devices as mass storage device I/O devices etc. is known as
- a. computer expendability *
- b. computer mobility
- c. computer enhancement
- d. computer upward compatability
28. Second generation computers are characterized by the use of
- a. vacuum tubes
- b. transistors *
- c. large scale integration ICs
- d. VLSI ICs
29. Fourth generation computers
- a. were built after 1970
- b. use microprocessors
- c. were first to use VLSI circuitry
- d. all of these *
30. A minicomputer
- a. has limited storage capacity ranging from 8000 to 16000 locations
- b. has relatively low speed and low capacity auxiliary storage devices
- c. has relatively small basic data unit size within the storage i.e. usually 8 to 16 digits for internal storage word
- d. all of these *
31. The language which a computer can understand is
- a. high level language b. assembly language
- c. machine language * d. all of these
32. The bare machine or electronic circuitry of a computer system is known as
- a. software b. hardware *
- c. firmware d. none of these
33. Computer software consists of
- a. system program
- b. application program
- c. operating system program
- d. all of these *
34. The function of a sorter in a computer system is to
- a. read one column at a time *
- b. compare data on different cards
- c. read one row at a time
- d. all of these
35. A chain printer prints
- a. by chemical or photographic means
- b. by impact of wheels of type against an inked ribbon and paper
- c. by impact of a chain of type against an inked ribbon and paper *
- d. none of these
36. An impact printer is
- a. faster than a nonimpact printer
- b. slower than a nonmiant printer
- c. capable of making carbon copies
- d. both (b) and (c) above *
37. The process of fetching and executing instructions one at a time in the order of increasing addresses is known as
- a. instruction execution
- b. straight line sequencing *
- c. instruction fetching
- d. random sequencing
38. One important feature which distinguishes microprocessor from microcomputer is that
- a. words are usually larger in microprocessor

- c. address register d. none of these
60. A file of records containing cumulative history or results of a accumulation is known as
a. control data file b. master file *
c. indexed file d. none of these
61. A file which contains transients data to be processed in combination with a master file is known as
a. sequential file b. master file
c. transmission file * d. random organization file
62. A technique by which more than one program can reside in primary storage at the same time and be executed concurrently is known as
a. multiprogramming *
b. multiprocessing
c. distributed processing
d. none of these
63. The following process is used to trace and eliminate mistakes in program or faults in equipments
a. housekeeping b. editing
c. debug * d. desk check
64. The device on which a record can be compared or tested to identify character by character with a retranscription is called a
a. sorter b. simulator
c. verifier * d. interpreter
65. Represents the predetermined arrangement of characters, fields, lines, in records, programs etc are represented by
a. index b. map
c. format * d. none of these
66. The technique which repeatedly uses the same block of internal storage during different stages of a problem is known as
a. overlay * b. overlapping
c. swapping d. reuse
67. The register used as a working area in CPU is
a. program counter b. instruction register
c. instruction decoder d. accumulator *
68. The register which holds the information before going to the decoder is
a. control register b. data register *
c. accumulator d. address register
69. The unit used to supervise each instruction in the CPU is
a. control logic unit * b. accumulator
c. ALU d. control register
70. The cycle which is required to fetch and execute the information is
a. clock cycle b. TRI cycle
c. introduction cycle * d. memory cycle
71. The three buses associated with a three-bus system are I/O bus, memory bus and the
a. address bus
b. unibus
c. direct memory access bus *
d. data bus
72. The bus which is used to transfer data from main memory to peripheral device is the
a. data bus b. input bus
c. DMA bus * d. output bus
73. On detection of an error, a part of the memory can be erased in
a. PROM b. EPROM
c. EROM d. EAROM *
74. An array of gates which can be used to patch an error in a ROM or alter the meaning of an instruction consists in
a. RAM b. EAPROM
c. PLA * d. PSW
75. The device which is used to connect a peripheral to bus is known as
a. control register
b. interface *
c. communication protocol
d. none of these
76. A read bit can be read
a. and written by CPU
b. and written by peripheral
c. by peripheral and written by CPU
d. by CPU and written by the peripheral *
77. A set of general purpose internal register is
a. stack b. scratch pad *
c. address register d. status register
78. A bus connected between the CPU and main memory that permits transfer of information between main memory and the CPU is known as
a. DMA bus b. memory bus *
c. address bus d. control bus
79. The register used in the control unit of the CPU to indicate the next instruction which is to be executed is
a. accumulator b. index register
c. instruction decoder d. program counter *
80. Which of the following statements is not applicable to serial transmission of data ?
a. one bit at time
b. faster method of transmission *
c. LSB transferred first
d. only one wire is used
81. An interrupt which can be temporarily ignored by the counter is known as
a. vectored interrupt b. non-maskable interrupt

- c. low priority interrupt* d. None of the above
82. An interrupt in which the external device supplies its address as well as the interrupt request is known as
 a. vectored interrupt *
 b. maskable interrupt
 c. nonmaskable interrupt
 d. designated interrupt
83. The ability to temporarily halt the CPU and use this time to send information on buses is called
 a. direct memory access
 b. vectoring the interrupt
 c. polling
 d. cycle stealing *
84. Which of the following enables peripherals to pass a signed down the bus to the next device on the bus during polling of the device ?
 a. DMA
 b. interrupt vectoring
 c. daisy chain *
 d. cycle stealing
85. An OP code
 a. translates a mnemonic
 b. instructs the CPU *
 c. stores data
 d. all of these
86. When used with I/O devices, the term intelligent implies
 a. a colour output capability
 b. speech processing capability
 c. high speed printing capability
 d. features to support off-line and online tasks *
87. What is the storage capacity of a Hollerith card which is organized into nibbles ?
 a. 32
 b. 64
 c. 120
 d. 240 *
88. How many symbols exist in Baudot code ?
 a. 32
 b. 29
 c. 58 *
 d. 76
89. How many addresses are required for 25×40 video RAM ?
 a. 1020
 b. 1920
 c. 1000 *
 d. 2000
90. What technology is used for flat panel display ?
 a. solid state *
 b. RBG monitor
 c. VLSI
 d. direct view storage tube
91. Compiler and interpreters are examples of
 a. system software *
 b. application software
 c. both system and application software
 d. none of these
92. A software program stored in a ROM that can not be changed easily is known as
 a. hardware
 b. linker
- c. editor
 d. firmware *
93. A system program which translates and executes an instruction simultaneously is known as
 a. a complier
 b. operating system
 c. interpreter *
 d. assembler
94. Relative to the program translated by a compiler, the same program when interpreted runs
 a. faster
 b. slower *
 c. at the same speed
 d. may be faster or slower
95. Use of which of the following simplifies the process of loading, running, changing and executing program ?
 a. interpreter *
 b. compilar
 c. loader
 d. editor
96. Which of the following statements referring to interpreter is correct ?
 a. It has rapid turn around *
 b. It is faster than complier
 c. It occupies less memory space
 d. It is preferred for complex calculations
97. Which of the following word signifies using two or more CPU's ?
 a. time sharing
 b. batch processing
 c. multiprogramming
 d. multiprocessing *
98. Which of the following takes the responsibility of all input and output operations ?
 a. data bus
 b. control bus
 c. channel *
 d. none of the above
99. The digitizing technology which uses an electric field radiated from the tablet and picked by cursor is
 a. raster
 b. electrostatic *
 c. sonic
 d. electromagnetic
100. In a computer, continuous line drawings are produced using
 a. chain printers
 b. daisy wheel printers
 c. plotters *
 d. thermal devices
101. Daisy wheel printer is a type of
 a. matrix printer
 b. impact printer *
 c. laser printer
 d. manual printer
102. Which of the following keyboards is the fastest ?
 a. Dvorak *
 b. Alphanumeric
 c. Numeric
 d. QWERTY
103. The QWERTY keyboard
 a. is the most popular keyboard *
 b. is the fastest keyboard
 c. is rarely used
 d. uses Dvorak layout
104. Which of the following devices can sense inventory data specified in bar codes ?
 a. mouse
 b. light pen

- c. holographs * d. joystick
105. Which of the following produces the best quality graphics reproduction ?
 a. laser printer b. ink jet printer
 c. plotter * d. dot matrix printer
106. Plotter accuracy is measured in terms of repeatability and
 a. buffer size b. resolution *
 c. vertical dimension d. intelligence
107. Interleaving of data becomes impossible when a channel operates in
 a. input mode b. output mode
 c. byte mode d. burst mode *
108. In electrostatic plotter, the term resolution refers to
 a. the number of dots per inch *
 b. the speed per inch
 c. the accuracy at which the plotter returns to a specific point
 d. dual axis tracking
109. Input data for electrostatic plotter must be in
 a. vector format
 b. raster format *
 c. a raster-to-vector format
 d. an organized format
110. The operating system manages
 a. memory b. processor
 c. disk and I/O devices d. all of these *
111. The process of transferring data intended for a peripheral device into a disk (or intermediate store) so that it can be transferred to peripheral at a more appropriate time or in bulk is known as
 a. multiprogramming b. spooling
 c. caching d. virtual programming *
112. Situation where two or more processes are reading or writing some shared data and the final result depends on who runs precisely are called
 a. race conditions *
 b. critical sections
 c. mutual exclusions
 d. message passing
113. Part of a program where the shared memory is accessed and which should be executed indivisibly, is called
 a. semaphores b. directory
 c. critical section * d. mutual exclusion
114. Producer consumer problem can be solved using
 a. semaphores b. event counters
 c. monitors d. all of these *
115. Moving process from main memory to disk is called
 a. scheduling b. catching
 c. swapping * d. spooling
116. Block catches or buffer catches are used to
 a. improve disk performance *
 b. handle interrupts
 c. increase the capacity of the main memory
 d. speed up main memory read operation
117. Which of the following operating systems uses write through catches ?
 a. UNIX b. DOS *
 c. ULTRIX d. XENIX
118. A system program which sets up an executable program in main memory ready for execution is
 a. assembler b. linker
 c. loader * d. test editor
119. A compiler for a high-level language that runs on one machine and produces code for a different machine is called
 a. optimizing compiler b. one pass compiler
 c. cross compiler * d. multipass compiler
120. For how many processes which are sharing common data, the Dekker's algorithm implements mutual exclusion ?
 a. 1 b. 2 *
 c. 3 d. 4
121. Banker's algorithm for resource allocation deals with
 a. deadlock prevention
 b. deadlock avoidance *
 c. deadlock recovery
 d. mutual exclusion
122. In which of the storage placement strategies is a program placed in the largest available hole in the main memory ?
 a. best fit b. first fit
 c. worst fit * d. buddy
123. Nonmodifiable procedure are called
 a. serially usable procedures
 b. topdown procedures
 c. concurrent procedures
 d. re-entrant procedures *
124. Round robin scheduling is essentially the pre-emptive version of
 a. FIFO *
 b. shortest job first
 c. shortest remaining time
 d. longest job first
125. Which of the following translator program converts assembly language program to object program ?
 a. assembler * b. compiler
 c. macroprocessor d. linker
126. System program such as compilers are designed so that they are
 a. re-enterable * b. nonreusable

- c. serially usable d. recursive
127. In which of the following addressing mode is the address of the location of the operand given explicitly as a part of the instruction ?
- a. absolute mode * b. immediate mode
c. indirect mode d. index mode
128. In which addressing mode is the address of the operand generated by adding a constant value to the contents of the register ?
- a. absolute mode b. indirect mode
c. immediate mode d. index mode *
129. Which of the following address modes facilitates access to an operand whose location is defined relative to the beginning of the data structure in which its appears ?
- a. absolute b. immediate
c. index * d. indirect
130. In which addressing mode the contents of a register specified in the instruction are first decremented and then these contents are used as the effective address of the operands ?
- a. index addressing b. indirect addressing
c. auto-increment d. auto- decrement *
131. The language mainly used for business data processing is
- a. FORTRAN b. PASCAL
c. COBOL * d. ALGOL
132. The language commonly used for scientific data processing is
- a. FORTAN * b. COBOL
c. LISP d. PASCAL
133. A unit record processing system
- a. has a file consisting of one record
b. has a record which occupies exactly one punched card *
c. consists of record such that each record has one data item
d. none of these
134. Which of the following is a limited purpose language designed to produce management programs ?
- a. FORTRAN b. BASIC
c. RPG * d. COBOL
135. The system flow chart
- a. shows the flow of data from the source documents to the final report
b. is an important tool in the design of a data processing system
c. uses more symbols than program flow chart
d. all of these *
136. A microprogram is
- a. usually written in high level language
- b. a sequencing program for the control unit of any processor *
- c. a program for microcomputers
- d. a program written in assembly language
137. The number of 4-bit ALU slices required to implement a 32-bit ALU is
- a. 4 b. 6
c. 8 * d. 16
138. FORTAN programming language is commonly used for
- a. mathematical problem solving *
b. business data processing
c. both mathematical problem solving and business data processing
d. real time and system applications
139. Set of rules is known as:
- a. Algorithm * b. Instruction
c. Programme d. None
140. Transistor acts as a _____ in computer function:
- a. Switch * b. Amplifier
c. Oscillator d. None of these
141. Binary digits are:
- a. 0 & 1 * b. 1 to 9
c. 1 to 5 d. 10 to 15
142. PC is abbreviated as:
- a. Personal computer *
b. Permanent computer
c. Personal count
d. None
143. For recording the data from document by:
- a. Floppy disc * b. RAM
c. ROM d. None
144. Floppy disk is read and stored in a computer's memory by:
- a. Floppy reader * b. Floppy drive
c. Both d. None
145. The disk is rotated arround:
- a. 360 rpm * b. 3600, rpm
c. 36,000 rpm d. 18 rpm
146. The I/p method MICR represents:
- a. Magnetic ink character recognition *
b. Magnetic ink character recognition
c. Magnetic Ion corresponding recognition
d. None
147. OMR represent:
- a. Optical mark reading
b. Optical mark recognition
c. Both *
d. None

174. In magnetic recording both reading and writing is done by:
 a. Same head * b. Different head
 c. Both d. None
175. Density of recording will be:
 a. $D = \frac{s \times p}{\pi \times d}$ b. $D = \frac{s \times \pi}{p \times d}$ *
 c. $D = \frac{s \times d}{\pi \times p}$ d. None
 d = diameter and all the meaning of alphabet is same as given previous question.
176. A 2.5 inches diameter disk pack has 6 plates, 512 byte per sector, 256 sector, 5268 tracks per surface, the capacity of disk is:
 a. 8.20 G byte * b. 8.28 M byte
 c. 8.82 G byte d. None
177. The recording density will be ____ (from above):
 a. $D = 16688$ byte/inch * b. $D = 16428$ byte/inch
 c. $D = 16828$ byte/inch d. None
178. The time taken to reach the specified cylinder is known as:
 a. Latency time b. Seek time *
 c. Both d. None
179. The average rotation delay equals half the time taken by the disk is known as:
 a. Seek time b. Latency time *
 c. Access time d. None
180. The sum of latency time and Seek time is known as:
 a. Seek time b. Latency time
 c. Access time * d. None
181. The unit of density of recording will be:
 a. Bytes/Inches * b. Inches/Bytes
 c. Both d. None
182. Magnetic discs are smooth metal plates coated on both sides with a thin film of _____:
 a. Semiconductor material
 b. Magnetic material *
 c. Conductor material
 d. None
183. The disk drive of Megnetic harddisk consists of _____ to rotate the disk:
 a. Motor * b. Generator
 c. Amplifier d. Oscillator
184. Information is recorded _____ disk:
 a. On the surface of *
 b. Into the disk
 c. in cylinder of
 d. None
185. If the disk of Magnetic harddisk has n plates there are:
 a. $2n$ surfaces * b. $2n+1$ surfaces
 c. $2n-1$ surfaces d. None
186. A track is divided into:
 a. Sectors * b. Surfaces
 c. Cylinders d. None extension
187. Capacity of track is defined as:
 a. $C = s \times p \times t \times m$ * b. $C = \frac{s \times p}{t \times m}$
 c. $C = \frac{s \times t}{m \times p}$ d. None
 $C =$ Capacity, $S =$ Number of bytes,
 $P =$ Number of Sectors, $T =$ Number of tracks,
 $M =$ number of Surfaces
188. The processor have:
 a. Input out put instruction
 b. Arithmetic Instruction
 c. Logical Instruction
 d. None *
189. Arithmetic operation is performed by:
 a. I/O Instruction
 b. Arithmetic Instruction *
 c. Logical Instruction
 d. None
190. Logical operation such as AND, OR operation is performed by:
 a. I/O Instruction b. Arithmetic Instruction
 c. Logical Instruction * d. None
191. In the format of instruction the operation code is:
 a. 4 bits * b. 2 bits
 c. 8 bits d. 3 bits
192. In the format of Instruction the operand address is:
 a. 12 bits * b. 8 bits
 c. 4 bits d. None
193. The Arithmetic operations are:
 a. Integer Arithmetic b. Real or Floating point
 c. Both 'a' & 'b' * d. None
194. Memory location storing is:
 a. 16 bits * b. 12 bits
 c. 8 bits d. None
195. In memory location the last bit is:
 a. Sign bit * b. Zero bit
 c. Parity bit d. None
196. In the normalized floating point mode, it is combination of:
 a. Montissa b. Exponent
 c. Both 'a' & 'b' * d. None

CHAPTER - 21

INSTRUMENT DISPLAYS, PANELS AND LAYOUTS

1. Following is the Director type of display
 - a. Altimeter
 - b. Air speed Indicator
 - c. Direction Indicator
 - d. Gyro Horizon *
2. Light-emitting diodes (LEDs) are formed from slice or chip of
 - a. Gallium arsenide phosphide *
 - b. Gallium arsenide
 - c. Gallium
 - d. Gallium phosphide
3. Liquid crystal display (LCD)
 - a. emit light
 - b. does not emit light
 - c. reflects from background
 - d. Both b. and c.*
4. Principle adopted in head up displays (HUD) is
 - a. collimating lens only
 - b. LED or LCD
 - c. CRT and collimating lens *
 - d. CRT only
5. Head up display is
 - a. Alphanumeric
 - b. Symbolic
 - c. Analogue
 - d. Both a. and b.*
6. Mounting of Instrument panels in more common practice sloped forward at about
 - a. 30° from vertical
 - b. 15° form vertical *
 - c. 30° from Horizontal
 - d. 15° from Horizontal
7. In displays of more recent origin (Boeing 747-400), following is included in basic T arrangement
 - a. EADI
 - b. EHSI and Machmeter
 - c. EHSI
 - d. EADI and EHSI *
8. EADI does not indicate
 - a. Heading
 - b. Mach number *
 - c. Vertical speed
 - d. Attitude
9. EADI stands for
 - a. Electronic Attitude Direction Indicator *
 - b. Electronic altitude direction indicator
 - c. Electronic Air Data Indicator
 - d. Electrical Air data indicator
10. EHSI stands for
 - a. Electrical Horizontal Simulator Indicator
 - b. Electronic horizontal simulator indicator
 - c. Electronic horizontal situation indicator *
 - d. Electrical horizontal situation indicator
11. Grouping arrangement of power plant instruments, currently adopted in boeing 737-400 A/C, displays numeric values by
 - a. Rolling digit configuration
 - b. LEDs arranged is dot matrix
 - c. Both a. and b. are correct *
 - d. none of these
12. CRT beam technology is utilized in
 - a. Distance measuring indicator
 - b. Weather radar indicators *
 - c. Control display units of INS
 - d. Display of engine performance
13. Liquid crystal technology is utilized in
 - a. Display of navigational data
 - b. Digital counter display of engine performance
 - c. Weather radar indication
 - d. Radio frequency selector indicators *
14. A display capable of producing light when display elements are electrically energised are called
 - a. In transient mode
 - b. In passive mode *
 - c. In active mode
 - d. Both a. and b.
15. In Boeing 737-300 series A/C, for flight-engineer as operating crew, instrument panel would be located on
 - a. behind co-pilot
 - b. behind captain
 - c. flight deck *
 - d. none of these

CHAPTER - 22

AIR DATA INSTRUMENTS

1. Manometric system of A/C is also known as
 - a. Hydraulic System
 - b. Air Data System *
 - c. Fuel System
 - d. Oil System
2. Under standard atmospheric condition, values of pressure, temperature, densities are
 - a. assumed to be constant *
 - b. actually remains constant
 - c. Both a. and b.
 - d. none of these
3. Air speeds are proportional to
 - a. Difference between pitot & static pressure *
 - b. Difference between static pressure & calibrated metering unit pressure
 - c. Difference between pitot pr & calibrated metering unit pressure
 - d. Pitot pressure only
4. Power supply to pitot tube is
 - a. 28 v DC
 - b. 115v AC
 - c. Both a. and b.*
 - d. none of these
5. The reading of an Air Speed Indicator corrected only for instrument error is
 - a. True Air Speed
 - b. Indicated Air Speed (IAS) *
 - c. Calibrated Air Speed
 - d. Computed Air Speed
6. When indicated air speed corrected for position error, is known as
 - a. True Air speed
 - b. Computed Air speed *
 - c. Indicated Air speed
 - d. Calibrated Air speed
7. When computed air speed is corrected for square law, it is known as
 - a. True Air Speed
 - b. Computed Air Speed
 - c. Indicated Air Speed
 - d. Calibrated Air Speed (CAS) *
8. When calibrated air speed is compensated for compressibility of air, it is known as
 - a. True Air Speed
 - b. Equivalent Air Speed *
 - c. Indicated Air Speed
 - d. Computed Air Speed
9. When Equivalent Air Speed is compensated for change in air temperature and density at various altitude; it is known as
 - a. True Air Speed (TAS) *
 - b. Calibrated Air Speed
 - c. Indicated Air Speed
 - d. Computed Air Speed
10. Indicated air speed (IAS) is achieved by
 - a. Correcting Air Speed Indicator for instrument error*
 - b. Correcting computed Air Speed for square law
 - c. Correcting Calibrated air speed for compressibility of air
 - d. Compensating equivalent Air Speed for square law
11. Computed airspeed is achieved by
 - a. Correcting indicated airspeed for instrument error*
 - b. Correcting indicated airspeed for pressure error
 - c. Computing calibrated air speed for compressibility error
 - d. Compensating equivalent airspeed for air temperature & density
12. Calibrated Air Speed (CAS) is achieved by
 - a. Correcting IAS for instrument error
 - b. Correcting IAS for pressure error
 - c. Compensating computed airspeed for square law*
 - d. Compensating equivalent airspeed for air temperature & density
13. True airspeed (TAS) is achieved by
 - a. Compensating equivalent air speed for change in air temperature & density *
 - b. Correcting IAS for pressure error
 - c. Correcting IAS for instrument error
 - d. Computing calibrated airspeed for compressibility error
14. Equivalent airspeed is achieved by
 - a. Correcting IAS for instrument error
 - b. Correcting IAS for pressure error
 - c. Correcting calibrated airspeed for compressibility of air *
 - d. Correcting equivalent airspeed for change in air temperature & density.
15. Bernoulli's theorem for a fluid in motion says total energy =
 - a. Position Energy+ Kinetic Energy+ velocity energy
 - b. Pressure Energy+Velocity Energy+Kinetic Energy
 - c. Position Energy+Kinetic Energy+Pressure Energy *
 - d. Pressure Energy+Position Energy+Kinetic Energy
16. Ventury tube is another means of creating
 - a. Differential pressure equivalent to air speed *
 - b. Differential pressure equivalent to altitude

- c. Differential pressure equivalent to metering unit of VSI
d. Differential pressure required for cabin differential pressure gauge
17. Surface of pressure head is
a. Painted
b. Not-painted and retains its smooth-Finish *
c. Painted with special paint
d. does not matter
18. While carrying out maintenance check on pressure head, ensure that
a. it is free from foreign matter
b. head is aligned parallel to centre line of A/C
c. head is aligned perpendicular to centre line of A/C
d. Both a. and b.*
19. On setting QNH on altimeter, vertical distance of all level, point or object considered as vertical distance of a level, is known as
a. Height
b. Elevation
c. Altitude *
d. Vertical altitude
20. On setting QFE in altimeter, the vertical distance of a fixed point above or below sea level is known as
a. Height
b. Elevation *
c. Altitude
d. Vertical Altitude
21. On setting the QFE in altimeter, the vertical distance of a level, point or object considered as a point measured from a specified Datum is known as
a. Height *
b. Elevation
c. Altitude
d. Vertical altitude
22. On standard Altimeter setting (SAS), the barometric pressure counters of altimeter are set to
a. aerodrome pressure
b. 1013.2mb or 29.92 in Hg *
c. Both a. and b.
d. Either a. and b.
23. Which Q-code is used for Heights, above a prescribed Transition Altitude
a. QFE
b. QMH
c. SAS *
d. Both a. and b.
24. In United Kingdom, altitude quoted as flight-level=FL 40 means
a. 40 feet
b. 400 feet
c. 4000 feet *
d. 40 meter
25. Ram rise referred to
a. Static air temperature below 0.2 mach
b. Static air pressure above 0.2 mach
c. Static air pressure below 0.2 mach
d. Static air temperature above 0.2 mach *
26. In addition to basic elements of VSI, Instantaneous Vertical Speed Indicators (IVSI) employ
a. one accelerometer *
b. servomotor
c. two accelerometers
d. amplifier
27. Direct measurement of static air temperature is not possible because of
a. adiabatic expansion
b. isothermal expansion
c. adiabatic compression *
d. isothermal compression
28. In total Air Temperature sensor, Recovery factor of 0.80 could measure Static Air Temperature plus.
a. 8% of Ram fall
b. 8% of Ram rise
c. 80% of Ram fall
d. 80% of Ram rise *
29. Sensitivity of a sensor in total Air temperature sensor is termed as
a. Sensitivity factor
b. Efficiency factor
c. Recovery factor *
d. Sensor factor
30. Total Air Temperature is equal to
a. Static Air Temp+Ram rise *
b. Static Air Temp-Ram rise
c. Static Air Temp+Static Air pressure
d. Static Air Temp-Static Air pressure.
31. Measurement of Total Air Temperature parameter is essential to manage the overall performance of
a. Auto-pilot
b. Altimeter
c. Engines *
d. Cabin pressure
32. In high speed aircraft; the Static Air Temperature is raised due to change in boundary layer behavior & friction effect; it is referred as.
a. Temperature rise
b. SAT rise
c. Friction rise
d. Ram rise *
33. Static Air Temperature (SAT) is equal to
a. Total Air Temp-Ram rise *
b. Total Air Temp+Ram rise
c. Total Air Temp-Static Air pressure
d. Total Air Temp+ Static Air pressure
34. Simplest direct reading type of indicator to measure Static Air Temperature employ principle of
a. moving coil instrument
b. variable resistance & bridge circuit
c. moving iron instrument
d. expansion & contraction of Bi - metallic element *
35. Total Air Temperature sensors are
a. C and Y pick-off type
b. E & I bar pick off type
c. Float type
d. probe type *
36. Air intake of Total Air Temperature sensor is made of
a. Nickel and iron
b. Nickel plated steel
c. Nickel plated beryllium copper *
d. Copper & Constantan

37. Air Temperature indicators are supplied with
 a. 28 VDC b. 115v AC *
 c. 215v.DC d. Both a. & c.
38. Air Temperature indicator works on the principle of
 a. Aneroid capsule
 b. E & I bar pick off
 c. Bourdon tube
 d. Resistance bridge circuit *
39. In servo operated Air Temperature indicator, error signal to drive AC servo motor is produced by
 a. Desyn transmitter
 b. Solid-State Chopper Circuit *
 c. Cam.mechanism
 d. Selsyn transmitter
40. In order to indicate whether temperature is positive or negative, Air Temperature indicators employ
 a. Indicator Drum b. Sign Changer
 c. Amplifier d. Both a. and b.*
41. OFF flag of Air Temperature indicator indicates
 a. excessive null voltage
 b. power failure
 c. sign changer failure
 d. Both a. and b.*
42. LCD type Air Temperature indicator; indicates
 a. TAT b. SAT
 c. TAT & SAT d. TAT, SAT & TAS *
43. Indication of TAT, SAT & TAS in LCD type Air Temp. indicator comes
 a. Simultaneously
 b. One by One *
 c. Two indication at a time
 d. none of these
44. When power is first applied, the LCD type Air Temperature indicator will indicate
 a. SAT b. TAS
 c. TAT * d. Both a. and b.
45. To select the quantity of TAT, SAT & TAS in LCD type Air temperature indicator, mechanism provided is
 a. push-button *
 b. selector knob
 c. automatic display
 d. simultaneous display
46. In some of the Total Air Temperature probe, an auxiliary sensing element is provided to
 a. increase the sensitivity
 b. to act as stand by
 c. transmit a signal to other system *
 d. for second TAT indicator .
47. Temperature parameter required to measure for efficient control and management of the overall performance of engines is known as
 a. Engine Temperature
 b. Air Temperature
 c. Static Air Temperature *
 d. Total Air Temperature
48. A test input facility in LCD type Air Temperature indicator activates display
 a. on for 2- sec & blank for 1-sec *
 b. on for 1 sec & blank for 2 sec
 c. remains ON
 d. remains OFF
49. Total Air Temperature signal is also supplied for measuring
 a. Oil Temperature Indicator
 b. Altitude Measuring module
 c. Attitude measuring module
 d. Speed measuring module *
50. Altitude alerting system is designed to alert a flight-crew by
 a. Aural warning b. Visual warning
 c. OFF flag d. Both a. and b.*
51. Altitude alerting system warning comes on when A/C approaches
 a. Zero altitude
 b. less than 1500' feet
 c. deviation from pre-selected altitude *
 d. Aircrafts ceiling altitude
52. Angle of attack is also termed as
 a. α -angle * b. B-angle
 c. V-angle d. none of these
53. Angle of attack is the angle between direction of relative Air flow to the
 a. Chord line of the pilot probe
 b. Chord line of the nose
 c. Chord line of the elevator
 d. Chord line of the wing *
54. Factor in determining the magnitude of lift generated by a wing is
 a. Mach number b. Beta angle
 c. Angle of attack * d. Total airspeed
55. The point above which, the lift of an aircraft decreases is known as
 a. Critical speed b. Stalling Angle *
 c. Critical altitude d. Stalling altitude
56. Value of stalling angle for a particular A/C varies between
 a. 10-15° b. 5-10°
 c. 0-12° d. 12-18° *
57. Following is not the factor of stalled condition of an A/C wing configuration
 a. high wing b. swept back wing
 c. span of wing * d. low wing

58. Following is not related to prevailing speed of an A/C wing configuration
- Engine power
 - Rates of change direction *
 - Flap angle
 - Rates of change of pitch
59. Stall warning comes on when A/C
- Crosses the stalling condition
 - On reaching the stalling condition
 - Just before stalling condition *
 - None of these
60. In small A/C stall warning sensor are mounted on
- Above the elevator
 - Under the elevator
 - Trailing edge of wing
 - Leading edge of wing *
61. In larger types of A/C. the stall warning system is not of
- Stick shaker type
 - Rudder shaker type *
 - Stick push or nudger
 - Both a. & c.
62. Stick shaking of stall warning system accomplishes a motor to a
- Engine throttle control
 - Control surfaces
 - Control column *
 - Air speed indicator
63. Operational change over strut micro switch from ground to air in stall warning system is mounted on
- Emergency exit door
 - Main exit door
 - Main landing gear
 - Nose landing gear *
64. Signals to motor of stick shaker of stall warning comes from
- stall warning sensor
 - flap position indicator
 - aileron position transmitter
 - both a. and b.*
65. On pressing the test switch of stall warning system, to show the continuity of the circuit
- Aural signal will come on
 - Visual light will come on
 - Indicator dial will rotate *
 - Both a. & c.
66. Stall warning system employed for rear mounted engine and T-tail configuration is
- Only indicator type
 - Stick shaker
 - Stick pusher
 - Both b. and c.*
67. In some type of stall warning indicator, stick-shaker operates when pointer is against horizontal
- Yellow and Green band *
 - Green & Red band
 - Red & Yellow band
 - None of these
68. Lowest layer of atmosphere is called
- Troposphere *
 - Stratosphere
 - Tropopause
 - Ionosphere
69. Troposphere of equator extends up to the height of
- 60.70 miles
 - 36,000 ft
 - 28,000 ft *
 - above 70 miles
70. Standard sea level pressure is
- 26.921" of hg
 - 1013.25 milibar *
 - 10.13 lbf/in
 - 28.15" of hg
71. Standard sea level temperature is
- 30°C
 - 15°C *
 - 15°F
 - 30°F
72. As per assumption of ICAN / ICAO, temp lapse rate is
- 2.98°C / 500 feet
 - 1.98°C / 1000 feet *
 - 1.98°C / 2000 feet
 - 2.98°C / 1000 feet
73. As per the standard atmospheric assumption, temp at 36,090 feet height will be.
- 15°C
 - 56.5°C
 - 56.5°C *
 - 15°C
74. Kew barometer is
- Adjustable cistern type
 - Adjustable scale type
 - Fixed scale & Fixed cistern type *
 - Adjustable scale & Adjustable cistern
75. Altimeter works on the principle of
- Mercury barometer
 - Water manometer
 - Moving coil instrument
 - Aneroid Barometer *
76. Duplicate instruments system in A/C is incorporated for
- When main system fails
 - When main power supply fails.
 - for special purpose
 - For co-pilot/crew indicating simultaneously *
77. As per British standards, A/C instruments and associated equipments comes in
- Aerospace I-200/300
 - Aerospace-L-100/200
 - Aerospace G-100/200 *
 - Aerpspace-A-200/300
78. ARINC specification stands for
- Automatic Radio Incorporated
 - Aeronautical Radio Indian Council.
 - Aeronautical Radio Incorporated *
 - Aeronautical Radio International Council.
79. In an instrument, measured quantity is exhibited by
- Coupling element
 - Indicating element *
 - Detecting element
 - Measuring element

80. Pilot-static pressure head is a
 a. Coupling element b. Indicating element
 c. Detecting element * d. Measuring element
81. In lever mechanism, by increasing the lever length.
 a. Movement of indicating element will increase
 b. Will remain unaffected
 c. Will decrease *
 d. Will compensate for temperature effect.
82. A variation in double tangent theme is
 a. Sin mechanism
 b. Cos mechanism
 c. Tan mechanism
 d. Skew tangent mechanism *
83. Loss of motion in trains of gear is known as
 a. movement loss b. back loss
 c. backlash * d. gear loss
84. To overcome the backlash; device used is
 a. Hair spring * b. lever mechanism
 c. Bi-metallic strip d. long coil
85. Material constituents of Hair springs is
 a. carbon and steel
 b. zink and copper
 c. copper and beryllium *
 d. copper & phospher
86. Bi-metallic strip is used for
 a. strengthening the shaft
 b. temperature compensation *
 c. elastic improvement
 d. sensitivity improvement
87. INVAR a metal constituent of Bi-metallic strip has steel with
 a. 36% carbon b. 36% copper
 c. 30% zink d. 36% nickel *
88. Thermomagnetic shunt method employs the principle of
 a. varying capacitance b. varying reluctance *
 c. varying voltage d. varying current
89. Standard angle of observation laid down from normal, for an instrument is
 a. 90° b. 45° *
 c. 15° d. 30°
90. The external pressure against which sealing of instrument is effective is normally
 a. 30 lbf/in² b. 15 lbf/in² *
 b. 15 inches of Hg d. 30" of Hg
91. For temperature compensation in instrument system, one of the method employes resistance of
 a. positive temperature co. efficient
 b. negative temp. co-efficient *
 c. low voltage coil d. high voltage coil
92. Use of colours in displays adds in
 a. accuracy b. decoration
 c. rapid assessment * d. night flying
93. Following is not associated in basic 'T' grouping of Instrument.
 a. Altimeter b. Air speed Indicator
 c. VSI d. course indicator *
94. Following is not associated in basic-six of flight instrument grouping
 a. Altimeter b. Air speed indicator
 c. Machmeter * d. Turn & slip indicator
95. To assist pilot in focusing their attention in basic-six or basic-T
 a. Red mark is put in these instruments
 b. White mark is put on these instruments
 c. Mental focus lines is drawn *
 d. Zebra mark is put on these instruments
96. Colour of light used for illumination of instrument during night flight is generally
 a. Red * b. Blue
 c. yellow d. Green
97. To indicate the airspeed range over which the A/C landing flaps may be extended in the take-off, ASI dial may have an additional
 a. RED arc b. WHITE arc *
 c. RED line d. White line
98. Meaning of yellow-arc in instruments range marking is
 a. Range in which operation is prohibited
 b. Takeoff precautionary ranges *
 c. Maximum limit
 d. Minimum limit
99. Director displays incorporates
 a. Altimeter Mechanism
 b. Machmeter Mechanism
 c. Gyro Horizon & TSI *
 d. Alimeter & ASI Mechanism
100. Head up displays does not indicate
 a. Altitude b. Air speed
 c. pitch & Roll attitude * d. Mach number
101. Instruments and panels are invariably finished in
 a. Black colour b. White colour
 c. Green colour d. Mett grey *
102. What type of display would you associate with Altimeter
 a. Qualitative b. Quantitative *
 c. moving tape d. Dual Indicator display
103. One of the method used for panel mounting of instrument is

- a. Clamp method * b. Rivet method
c. Push fit method d. Fixing method
104. Magnetic flow-line indicator is of
a. Four position type b. Three position type
c. Two position type * d. One position type
105. Purpose of heating element in pressure head is to
a. eliminate position error
b. smoothen the pitot pressure
c. evaporate the moisture in air
d. melt the ice formed over pressure-head *
106. An amber light in cockpit will indicate that pressure head heater circuit is
a. failed
b. is in operation *
c. only pitot pressure is working
d. only static pressure is working
107. Position error or pressure error can be defined as
a. Pitot pressure disturbance due to change in temperature
b. Static pressure disturbance due to change in temperature
c. Both p/s pressure disturbance due to change in temperature
d. Static pressure disturbance due to flow field of air*
108. One of the method to minimize the P.E. is
a. increase the casing dia and decrease the distance of static orifice
b. probe having big dia but small in length
c. decrease the casing dia and decrease the distance of static orifice
d. decrease the casing dia and increase the distance of static orifice *
109. For sub-sonic A/C, some typical location of pressure head in
a. tail of wing tip
b. ahead of elevator
c. ahead of wing tip *
d. underneath the wing tip
110. Transducer intended for aircraft in which P.E is essential proportional to the function of
a. Altitude of A/C
b. Air speed of A/C
c. mach number of A/C *
d. difference of pitot & static pr
111. Drain trapes & valves are mounted in pitot-static system for
a. static pressure source
b. pitot pressure source
c. to minimise surge in pressure
d. to remove moisture in line *
112. Pitot/Static pressure are transmitted through seamless and
a. bend pipe line
b. corrosion-resistant metal pipeline *
c. rough pipe line
d. thick material pipe line
113. Bourden tube type pressure gauge is
a. electrical type b. direct reading type *
c. remote sensing type d. eddy current type
114. Minimum diameter of pitot/static metallic pipe line is
a. 4 inches b. 2 inches
c. 1/4 inches * d. 1/2 inches
115. In conjunction with-vacuum chamber, which barometer serves as a standard for calibration of altimeter
a. fortin b. New man
c. Kew * d. both a. and b.
116. Line dividing troposphere and stratosphere is known as
a. stratopause b. tropopause *
c. Ionopause d. Ozonopause
117. At the tropopause the pressure falls from sea level value to
a. Quarter * b. half
c. 1/10th d. 3/4th
118. Stratosphere extends upto an average height of
a. 20-30 miles b. 40-50 miles
c. 50-60 miles d. 60-70 miles *
119. Ozonosphere is also known as
a. ionosphere *
b. stratosphere
c. troposphere
d. standard atmosphere
120. Torricellian vacuum is space
a. inside the vacuum chamber
b. inside a sealed case & instrument
c. above ionosphere
d. upper end of sealed barometer tube *
121. Pressure sensing element is made up of 3-neroide capsule stacked together
a. to get linear scale
b. for square low compensation
c. to minimise temp compensation
d. to increase sensitivity *
122. Linearity in altimeter mechanism is maintained between pressure counter and pointers by
a. capsules b. u - shaped bracket
c. milibar counter d. cam & follower *
123. When atmosphere confirms the standard values, altimeter will read
a. pressure altitude * b. cabin altitude
c. indicated altitude d. none of the above

124. On setting the QFE code, altimeter will
- Read zero
 - airfield height (when std. sea level pr. is 1013.2 mbar)
 - to read altimeter the height of airfield during take off & landing *
 - for calibration
125. In air traffic control secondary surveillance radar, for altitude reporting, mode used is
- A
 - B
 - C *
 - D
126. In some versions of altimeter, yellow & black striped disc serves as low altitude warning for altitude below
- 10,000 feet
 - 16,000 feet *
 - 20,000 feet
 - 13,000 feet
127. The inductive type pick-off consists of pivoted laminated I-bar and
- X-bar
 - E-bar *
 - C-bar
 - O-bar
128. In servo altimeter how many phase drag-cup type of motor is coupled by a gear train to pointer & counter assembly
- 3-phase
 - two-phase *
 - Single phase
 - DC-motor
129. In E & I bar type of pick-off, input voltage is applied in E Bar's.
- one of outer limbs
 - both the outer limbs
 - centre limb *
 - both AC & DC
130. Supply fed to the E & I bar type of pick off is
- direct current
 - alternating current *
 - pulsating DC
 - both AC & DC
131. In servo-altimeter, while setting the millibar-counter, the E & I bar position
- gets altered *
 - does not get altered
 - sometimes gets altered
 - never gets altered
132. In servo-altimeter a warning flag comes into view, whenever
- altimeter is in operation
 - servo-motor over-run *
 - servo-motor trails
 - set knob is rotated
133. Signals picked up from E & I bar is fed to
- servo-motor
 - solenoid
 - amplifier *
 - digital counter
134. When the barometric pressure setting knob in servo altimeter is rotated
- E-bar is defaulted
 - error signal is fed to amplifier
 - pressure counters are turned *
 - servo-motor is rotated.
135. Cabin altimeter indicates
- height of A/C above sea level
 - height of A/C above airfield
 - cabin temperature
 - cabin differential pressure *
136. Input pressure to cabin altimeter is
- A/C pitot-pr only
 - A/C static pr only
 - A/C pitot & cabin pr
 - A/C static & cabin pr *
137. Altitude alerting system gives warning in the form of a.
- flag
 - Zebra mark
 - light or aural *
 - message
138. Air speed indicator measures
- pitot-pressure
 - static pressure
 - difference in pitot & static pr *
 - non-linear movement
139. 1 knot is equal to
- 1m.p.h
 - 1kmph
 - 1.15m.p.h *
 - 1.15kmph
140. Capsule assembly of ASI displaces in accordance with
- logarithmic movement
 - square law *
 - linear movement
 - non-linear movement
141. In ASI, square law is compensated by
- modifying capsule assembly
 - by graduating dial
 - Bi-metallic strip
 - Bananna slot method *
142. Dial making of square law effected scale will be
- more open at start
 - less open at start *
 - more open at middle of dial
 - even at all over range
143. In ASI a device of 'tuning' spring which bears against capsule & retards it is used
- to minimise the operating range
 - to overcome the surge in pitot pr
 - for compensation of square law *
 - to set the air speed during flying
144. Mach number is the ratio of
- pitot pressure to static pressure
 - static pressure to pitot pressure
 - speed of sound to speed of A/C
 - speed of A/C to speed of sound *
145. Critical Mach number is the ratio of
- Sound speed/Air speed
 - Air speed/Sound speed

- c. Air speed/Sonic speed *
d. Sonic speed/Air speed
146. Critical mach number is fixed for every
a. Machmeter b. Altitude
c. Air speed indicator d. Aircraft *
147. In mach meter mechanism the dividing function of altitude unit is accomplished by
a. Intermediate sliding rocking shaft
b. Train of gears *
c. Set of celibrated leaf springs
d. pressure bellow
148. Machmeter measures V/A , in terms of pitot static pressures, it will be
a. p/s b. $(p-s)/s$ *
c. $s/(p-s)$ d. s/p
149. In Mach/Air speed indicator; mach number is indicated by
a. a pointer and fixed scale
b. Digital counter
c. Command bug
d. Rotating dial and calibrated scale *
150. In Mach/Air speed indicator; a second pointer is known as
a. velocity maximum pointer
b. maximum velocity pointer
c. velocity maximum operating pointer *
d. velocity pointer
151. In Mach/Airspeed Indicator, two external index pointers can be set for
a. any desired critical mach number
b. any desired altitude for particular mach number
c. any desired reference speed *
d. any desired mach number
152. Logarithmic scale of most of VSI is
a. less open near zero mark
b. more open near zero mark *
c. even throughout the range
d. more open in centre.
153. Pressure applied to VSI are
a. only pitot b. only static *
c. poth pitot & static d. static & cabin centre
154. Pressure applied to machmeter are
a. only pitot b. only static
c. both pitot & static * d. pitot & cabin pressure
155. In VSI pressure surge to the capsule is restricted by
a. metering unit b. leaf spring
c. static unit d. capillary tube *
156. One of the pressure to VSI is static;the other pressure is from
a. from servo altimeter
b. A/C pitot pressure
c. restriction of metering unit *
d. cabin pressure
157. In VSI metering unit, airflow through capillary is laminar one, while air through orifice is
a. vibrating b. turbulent *
c. whistling d. smooth
158. Range setting of VSI during initial & subsequent calibration is achieved by
a. one calibrated spring
b. two calibrated springs *
c. Bananna slot method
d. inversely as the temperature
159. Differential pressure across an orifice varies
a. directly as pressure
b. inversely as pressure
c. directly as temperature
d. inversely as the temperature *
160. In typical VSI indicator, the upper row of screws & the upper spring controls
a. rate of climb
b. rate of descent calibration *
c. smooth movement of pointer
d. damping force on pointer.
161. Instantaneous VSI consists an additional mechanism of
a. airspeed indicator b. machmeter
c. accelerometer * d. altimeter
162. Accelerometer mechanism of instantaneous VSI comprises of
a. two small square bolls
b. two small cylindrical dash Pots *
c. one small square dash
d. two spring loaded mass.
163. In CADC system, vertical speed transmission is accomplished by means of
a. tachogenerator * b. calibrated spring
c. selsyn d. linear shaft
164. Speed of sound is proportional to the product of a constant C and
a. absolute free air temp
b. abs. atmospheric pressure
c. square root of abs free air temp *
d. square root of abs.free air pressure
165. In CADC system, pressure sensing is accomplished by
a. one pressure transducer
b. three pressure transducer
c. two pressure transducer *
d. four pressure transducer

166. One of the pressure transducer of CADC senses static pressure while the other senses
- pitot
 - static
 - both pitot & static *
 - none
167. In CADC, the machmeter module & true airspeed module are
- signal receiving device
 - signal interpreting device
 - only indicating device
 - pure signal generating device *
168. In CADC pitot/static pressure transducer operates on principle of
- variable capacitance
 - variable resistance
 - force balance *
 - variable inductance
169. In some types of altitude & airspeed transducers, pressure sensing is accomplished by
- electro-static method
 - variable resistance method
 - variable inductance method
 - piezo-electric method *
170. Scale linearity in CADC system is normally accomplished by means of
- calibrated screws & spring method
 - Bananna slot method
 - cams & cam follower *
 - adjusting the lever length
171. In CADC vertical speed data transmission signal of tachogenerator is modified by
- potentiometer *
 - bridge circuit
 - cam-mechanism
 - gear shaft
172. Pressure error correction is applied as a function of
- airspeed indicator *
 - machmeter
 - altimeter
 - pitot pressure
173. Mach unit servomotor drives a second cam which corrects P.E. of
- air speed indicator
 - mach/airspeed indicator
 - altitude indicator *
 - vertical speed indicator
174. In practical method of TAS computation, total temp is sensed by
- resistance element type of probe *
 - inductive element type of probe
 - thermocouple
 - thermometer
175. One of the arm of temperature measuring bridge circuit is formed by
- variable inductor
 - variable resistance
 - motor driven pot-meter *
 - variable capacitors
176. Calibration of bridge circuit is such that, motor is made to rotate through an angle proportional to (absolute indicated stagnation temperature = T_i)
- $\log \sqrt{T_i}$ *
 - $\log T_i$
 - $1/\log \sqrt{T_i}$
 - $1/\log T_i$

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CHAPTER - 23

DIRECT READING COMPASSES

1. Requirement of Direct Reading compass on present-day A/C is because
 - a. it is primary directional reference *
 - b. it is Airworthiness requirements
 - c. it is more efficient
 - d. both b. and c.
2. Earth's weak magnetic fields culminates in two internal
 - a. geographic poles
 - b. north & south true
 - c. magnetic poles *
 - d. both a. and b.
3. Magnetic meridian is a imaginary line passing through
 - a. plane between magnet and centre of earth *
 - b. plane between magnet and equator
 - c. plane between magnet and poles
 - d. none of these
4. Earth's magnetic field has maximum intensity or strength at
 - a. magnetic foci
 - b. theoritically at magnetic poles
 - c. true north and south
 - d. both a. and b.*
5. Earth's magnetic field and poles remains
 - a. varying periodically
 - b. varying irregularly
 - c. fixed at a point
 - d. both a. and b.*
6. True and magnetic meridians intersects each other at horizontal angle of
 - a. always of 90°
 - b. always of 180°
 - c. between 0° to 180°*
 - d. none of these
7. The horizontal angle of intersection of True and Magnetic maridian is called
 - a. Magnetic variation
 - b. Magnetic declination
 - c. Magnetic deviation
 - d. Both a. and b.*
8. When direction of magnetic maridian inclines to right of the true maridian; it is called
 - a. Easterly *
 - b. Westerly
 - c. Northerly
 - d. Southerly
9. Ferrous nature of rocks on earth disturbs the main magnetic fields it causes
 - a. Normal variation
 - b. No variation
 - c. Abnormal variation *
 - d. Compansated
10. Magnetic field change over long period due to changing position of magnetic poles relative to true pole is termed as
 - a. Annual change
 - b. Secular change *
 - c. Diurnal change
 - d. Daily change
11. Change in magnetic field due to small seasonal fluctuations superimposed on the secular change is termed as;
 - a. Diurnal change
 - b. Daily change
 - c. Annual change *
 - d. Both a. and b.
12. An imaginary line joining places having equal magnetic variation is called
 - a. Isogonal line *
 - b. Agonic line
 - c. Aclinic line
 - d. Isodynamic line
13. An imaginary line joining places having zero magnetic variation is called
 - a. Isogonal line
 - b. Agonic line *
 - c. Aclinic line
 - d. Isodynamic line
14. Earth's magnetic line does not pass
 - a. Horizontally at equator *
 - b. Horizontally at magnetic
 - c. Vertically at north pole
 - d. Vertically at south pole
15. If a suspended magnet is carried along a meridian; at south pole its
 - a. Red end will go down
 - b. Blue end will go down *
 - c. remains unaffected
 - d. None of these
16. the angle the magnetic lines make with earth's surface at any given place is called
 - a. Magnetic inclination
 - b. Angle of dip
 - c. Magnetic deviation
 - d. Both a. and b.*
17. Magnetic inclination at magnetic pole will be
 - a. 0 degree
 - b. 90 degree *
 - c. 45 degree
 - d. 180 degree
18. Angle of dip of magnetic equator will be
 - a. 0°*
 - b. 90°
 - c. 45°
 - d. 180°
19. Angle of dip remains same at the places coming in line known as
 - a. Isoclinal line *
 - b. Aclinic line
 - c. Magnetic inclination line
 - d. Agonic line
20. Places coming in line, having zero magnetic dip is known as
 - a. Isogonal line
 - b. Agonic line
 - c. Isodynamic line
 - d. Aclinic line *

21. Magnetic equator on earth is also known as
 a. Isogonal line b. Agonic line
 c. Aclinic line * d. Isothermal line
22. Line joining places having equal H & I forces of magnetic field is known as
 a. Magnetic variation line b. Agonic line
 c. Isogonal line d. Isodynamic line *
23. In case of compasses; earth's magnetic force is given relative to the H-force at
 a. Genwa b. Paris
 c. Greenwich * d. none of these
24. Direct reading compass doesnot have following in common principle
 a. Bowl
 b. Liquid damping
 c. Heading selector *
 d. Liquid expansion bellows
25. Magnet of Direct Reading compass is made of
 a. Annular cobalt b. Steel magnet
 c. Laminated magnet d. Both a. and b.*
26. Graduation increments of light alloy card of Direct Reading compass is
 a. 2° b. 5°
 c. 10° * d. 30°
27. Reading of Direct Reading compass is read against
 a. Index mark b. Lubber line *
 c. Reference mark d. Rubber line
28. Mechanism of Direct Reading compass is pendulously suspended
 a. Platinum tipped b. Cobalt tipped
 c. Iridium-tipped * d. Steel tipped
29. Pivot point of magnet system of Direct Reading compass is at
 a. Centre of gravity
 b. Above centre of gravity *
 c. Below centre of gravity
 d. None of these
30. Bowl of the Direct Reading compass is made of
 a. Diakon plastic * b. Cellulose plastic
 c. Glass d. None of these
31. Bowl chosen for Direct Reading compass has properties of
 a. Self liquid expansion
 b. Self-liquid compression
 c. Magnifying effect *
 d. Both a. and b.
32. Fluid used in Direct Reading compass is
 a. Gasoline b. Silicon fluid *
 c. Oil d. None of these
33. Aperiodic compass means
 a. Magnet system returns to equilibrium directly
 b. Magnet system does not overshoot or oscillate
 c. Magnet system returns very fast
 d. Both a. and b.*
34. To minimise the friction and wear in the magnetic compass of Direct Reading type, mechanism employ is
 a. Ball bearing b. Fluid *
 c. Roller bearing d. None of these
35. To compensate the expansion of fluid due to change in temperature the device used in Direct Reading compass
 a. Bowl b. Fluid
 c. Bellow * d. Both a. and b.
36. Deviation compensator provided in Direct Reading compass, compensates co-efficients
 a. C b. B
 c. A d. Both a. and b.*
37. Deviation compensator provided in Direct Reading compass to compensate
 a. Horizontal components of A/C magnetism
 b. Vertical component of A/C magnetism
 c. Magnetic dip
 d. Both a. and b.*
38. Type of magnet used in Direct Reading compass is
 a. Needle type * b. Hore shoe
 c. Bar type d. Both a. and b.
39. The minimum distance at which equipment may be safely positioned from compass exceeding specified values of design is known as
 a. Magnetic safe distance
 b. A/C safe distance
 c. Compass safe distance *
 d. Both a. and b.
40. The distance measured form the centre of compass magnet system to the nearest point on the surface of equipment is known as
 a. Magnetic safe distance b. A/C safe distance
 c. Compass safe distance * d. Both a. and b.
41. Main errors in a Direct Reading compass are Turning error and
 a. Acceleration error *
 b. Compressibility error
 c. Magnetic error
 d. Both a. and b.
42. Error caused due to displacement of centre of gravity from its normal position in magnet system of Direct Reading compass is
 a. Turning error * b. Acceleration error
 c. Gravity error d. Both a. and b.
43. During acceleration error on a northerly heading to Northern hemisphere the north end of the magnet will

- a. go down without azimuth rotation *
 b. go up with azimuth rotation
 c. go up without azimuth rotation
 d. go down with azimuth rotation
44. During acceleration error on a easterly heading in northern hemisphere the north end of the magnet will
 a. go down without azimuth rotation
 b. go up without azimuth rotation
 c. rotate the magnet in clockwise direction *
 d. rotate the magnet in anti-clockwise direction
45. Easterly deviation on easterly headings and westerly deviation on westerly heading is caused during acceleration of Direct Reading compass
 a. At equator
 b. At pole
 c. At northern hemisphere *
 d. At southern hemisphere
46. Acceleration error in Direct Reading compass does not get effected with
 a. Change in A/C attitude
 b. At northern hemisphere
 c. At southern hemisphere
 d. None of these *
47. Error caused due to swing outward and rotate of the magnet system of Direct Reading compass is known as
 a. Turning error *
 b. Acceleration error
 c. Deceleration error
 d. Both a. and b.
48. Turning error does not depends upon
 a. Heading of A/C
 b. Tilt angle of magnet system
 c. Magnetic dip
 d. None of these *
49. Hard iron magnetism in the A/C is caused due to
 a. Power plants & other equipment *
 b. Induction by earth's magnetic field
 c. Heading and attitude of A/C
 d. Geographical position of A/C
50. Soft-iron magnetism in A/C is caused due to
 a. Power plants and other equipments
 b. Hard material in A/C structure
 c. Heading and attitude of A/C *
 d. None of these
51. Intermediate iron type of magnetism does not caused due to
 a. Heading and attitude of A/C
 b. Geographical position of A/C
 c. Power plants and other equipment
 d. None of these *
52. Positive deviation of Aircraft magnetism is called
 a. Easterly *
 c. Northerly
- b. Westerly
 d. Southerly
53. Negative deviation of A/C magnetism is called
 a. Easterly
 c. Northerly
- b. Westerly *
 d. Southerly
54. Various magnetic components which cause deviation are designated for permanent hard iron magnetism by
 a. Capital letter *
 c. Both a. and b.
- b. Small letter
 d. None of these
55. Deviation caused due to soft iron magnetism is designated by
 a. Capital letters
 c. Both a. and b.
- b. Small letters *
 d. None of these
56. Components of Hard-iron magnetism are known as
 a. A,B,C
 c. Both a. and b.
- b. P,Q,R *
 d. None of these
57. Component 'R' of hard iron magnetism is effective in
 a. Aircraft attitude *
 c. Both a. and b.
- b. Aircraft altitude
 d. None of these
58. Component 'P' of hard iron magnetism is related to
 a. Logitudinal axis *
 c. Vertical axis
- b. Lateral axis
 d. none of these
59. Component 'Q' of hard iron magnetism is related to
 a. Logitudinal axis
 c. Vertical axis
- b. Lateral axis *
 d. none of these
60. Component 'R' of hard-iron magnetism is related to
 a. Logitudinal axis
 c. Vertical axis *
- b. Lateral axis
 d. none of these
61. On analysis of soft iron magnetism H-component is further divided into additional components
 a. X
 c. Z
- b. Y
 d. Both a. and b.*
62. Polarities and strength of the component varies with changes in A/C heading relative to fixed direction of earth's component-H, are
 a. A and B
 c. P and Q
- b. X and Y *
 d. None of these
63. A change in polarity of component Z will recur with change in
 a. Magnetic hemisphere *
 c. Northerly heading
- b. Within northern hemisphere
 d. Both a. and b.
64. A/C component -Z along with two additional component X and Y are related to
 a. X in lateral axis
 b. y- in lateral axis *
 c. Z in lateral axis
 d. None of these

65. In sequence X,Y,Z components of soft iron magnetism relates to axis
 a. Lateral, Longitudinal, Vertical
 b. Vertical longitudinal lateral
 c. Lateral, Vertical, Longitudinal
 d. Longitudinal, Lateral, Vertical *
66. Deviation co-efficients of A/C are of
 a. Two types
 b. Five types *
 c. Six types
 d. Three types
67. Following is not designated as deviation co-efficient of A/C
 a. C
 b. E
 c. D
 d. None of these *
68. The polarities and direction of components cZ and fZ depends on whether an A/C is in
 a. Northern hemisphere
 b. Southern hemisphere
 c. Northerly direction
 d. Both a. and b.*
69. The deviation caused by fZ components in lateral axis of A/C is same as
 a. Corresponding polarities of component 'Q' *
 b. Corresponding polarities of component 'P'
 c. Corresponding polarities of component 'R'
 d. Both a. and b.
70. Deviation component in vertical axis whose corresponding polarities are same as component-R is
 a. eY
 b. hY *
 c. bY
 d. Both a. and b.
71. Co-efficient caused due to non-magnetic cause of misalignment of compass with A/C longitudinal axis is
 a. A
 b. B *
 c. C
 d. Both a. and b.
72. Co-efficient-A is calculated for average of
 a. Cardinal headings
 b. Quadrantal headings *
 c. N and S
 d. Both a. and b.
73. Co-efficient which represents deviation due to hard-iron magnetic component P and soft iron component cZ is
 a. A
 b. B *
 c. C
 d. Both a. and b.
74. When deviations is calculated for East and West the result is
 a. Co-efficient-A
 b. Co-efficient B *
 c. Co-efficient-C
 d. Co-efficient D
75. Deviation due to co-efficient B may also be expressed as
 a. $B \sin q$ *
 b. $B \cos q$
 c. $B \tan q$
 d. None of these
76. Co-efficient which represents deviation due to hard-iron component- Q and soft-iron component fZ is
 a. A
 b. B
 c. C *
 d. D
77. Deviation in North and South is calculated for
 a. Co-efficient-A
 b. Co-efficient-B
 c. Co-efficient-C *
 d. Co-efficient-D
78. Deviation due to co-efficient-C may also be expressed as
 a. $C \sin q$
 b. $C \cos q$ *
 c. $C \tan q$
 d. None of these
79. Formula
 is used to calculate
 a. Co-efficient C
 b. Co-efficient-D *
 c. Co-efficient E
 d. None of these.
80. Deviation caused by components aX and eY vary as the sine of
 a. A/C heading
 b. $1/2$ A/C heading
 c. twice an A/C heading *
 d. none of these.
81. Formula
 is used to calculate
 a. Co-efficient-C
 b. Co-efficient-D
 c. Co-efficient-E *
 d. None of these.
82. Deviation due to Co-efficient 'E' may also be expressed as
 a. $E \sin q$
 b. $E \sin 2q$
 c. $E \cos q$
 d. $E \cos 2q$ *
83. Following is not the factor of total deviation on an uncorrected compass for any direction of an A/C heading
 a. $B \sin q$
 b. $D \sin 2q$
 c. $E \cos 2q$
 d. none of these *
84. Adjustment related to positioning of compass in its mounting is related to
 a. Co-efficient 'A' *
 b. Co-efficient 'B'
 c. Co-efficient 'C'
 d. None of these.
85. Compass swinging procedure is carried out to calculate
 a. Damping
 b. Swirling
 c. Deviation *
 d. Both a. and b..
86. Compensating mechanism magnet in lateral axis of compass is to provide
 a. Longitudinal field
 b. Lateral field *
 c. Vertical field
 d. None of these
87. For adjustment of co-efficient-'C'; the compensating mechanism in compass is mounted in
 a. Longitudinal axis *
 b. Lateral axis
 c. Vertical axis
 d. None of these

88. From source of magnet intensity of magnetic field varies
- a. Inverse proportion
 - b. Square of distance
 - c. Direct proportion
 - d. Both a. and b.*
89. In southern hemisphere turning error will cause an A/C turns eastward from northerly heading to indicate a turn in
- a. Correct sense but greater magnitude *
 - b. Correct sense but lesser magnitude
 - c. Both a. and b.
 - d. None of these
90. Northerly turning error relates to turns commence near to
- a. Northerly or southerly *
 - b. Easterly-Westerly headings
 - c. Both a. and b.
 - d. None of these
91. When turning from easterly or westerly heading in either northern or southern hemisphere
- a. Maximum error will occur
 - b. No error will occur *
 - c. Depends upon N-S hemisphere
 - d. None of these.

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CHAPTER - 24

GYROSCOPIC FLIGHT INSTRUMENTS

1. Veering freedom of gyro relates to
 - a. Longitudinal axis
 - b. Lateral axis
 - c. Vertical axis *
 - d. None of these
2. Tilting freedom of gyro relates to
 - a. Horizontal axis
 - b. Axis right angle to spin axis
 - c. Vertical axis
 - d. Both a. and b.*
3. Universily mounted gyro rotor has freedom in
 - a. One axis
 - b. Two axis
 - c. Three axis *
 - d. None of these
4. Three degrees of freedom is achieved for gyro rotor by
 - a. One gimble ring
 - b. Three gimble ring
 - c. Gimble system *
 - d. None of these
5. All axis of gyroscope are perpendicular to each other at
 - a. A/C bank condition
 - b. Normal operating condition *
 - c. A/C pitch up/down condition
 - d. None of these
6. Gyroscope has the properties of
 - a. Rigidity
 - b. PreSSION
 - c. Radius of gyration
 - d. Both a. and b.*
7. Angular momentum is the product of angular velocity (W) and
 - a. Weight of rotator (W)
 - b. Radius of gyrotion
 - c. Moment of Inertia (I) *
 - d. None of these
8. Following factor does not effect the rigidity of a gyroscope
 - a. Mass of rotor
 - b. Speed of rotation
 - c. Diameter of gimbalring *
 - d. Radius of gyration
9. Angular change in the direction of plane of rotation under the influence of applied force takes place at 90° away in
 - a. The direction of rotation *
 - b. Opposite to the direction of rotation
 - c. Outer Gimble ring
 - d. None of these
10. The axis about which the precession of a gyro takes Place is known as
 - a. Input axis
 - b. Output axis *
 - c. Spinning
 - d. Varying axis
11. Horizontal spin axis of gyro rotor is utilised for establishing reference datum in
 - a. Pitch attitude change
 - b. Roll attitude change
 - c. Directional change *
 - d. Both a. and b.
12. Vertical spin axis of gyro rotor is utilised for establishing reference datum in
 - a. Pitch attitude change
 - b. Roll attitude change
 - c. Directional change
 - d. Both a. and b.*
13. In two-axis displacement gyroscope
 - a. Spin axis is discounted *
 - b. Titting axis is discounted
 - c. Vertical axis is discounted
 - d. None of these
14. Spin axis is discounted in the gyroscope used for
 - a. Attitude sensing *
 - b. Directional sensing
 - c. None of these
 - d. Both a. and b.
15. Apparent drift in gyroscope is caused due to
 - a. Carrying it over earth's surface
 - b. Rigidity
 - c. Precision
 - d. None of these *
16. Limitation of free gyroscope caused due to rotation of earth's rotation is
 - a. Apparent drift *
 - b. Transport wander
 - c. Gimble lock
 - d. None of these
17. Transport wander in free gyroscope is caused due to
 - a. Discounting of spin axis
 - b. Discounting of tilting axis
 - c. Carrying a gyroscope over earth's surface *
 - d. None of these
18. Earth rate (We) is
 - a. 15°/ hour *
 - b. 15°/ minute
 - c. 15°/ second
 - d. None of these
19. Apparent drift doesnt depend upon
 - a. Latitude of position
 - b. Orientation of spin axis
 - c. Angular input
 - d. None of these *
20. Gyrolimit caused due to imperfection in gyroscope ie bearing friction and unbalanced gimble system is known as
 - a. Apparent drift
 - b. Real drift *
 - c. Transport wander
 - d. Both a. and b.

21. Real drift can be minimized by
 - a. precision engineering techniques
 - b. Design & construction
 - c. Discounting spin axis
 - d. Both a. and b.*
22. When input axis of gyro is aligned with Local N-S component the earth rate to an observer at glatitude will be
 - a. $15^\circ \sin \theta$
 - b. $15^\circ \cos \theta$ *
 - c. $15^\circ \tan \theta$
 - d. Both a. and b.
23. Apparent drift rate to an observer at θ -lattice, when input axis is aligned to local vertical component of earth rate will be
 - a. $15^\circ \sin \theta$ *
 - b. $15^\circ \cos \theta$
 - c. $15^\circ \tan \theta$
 - d. None of these
24. Apparent drift will be zero, when input axis of gyro is aligned to
 - a. N-S component of ω_e
 - b. E-W component of ω_e *
 - c. Both a. and b.
 - d. None of these
25. Apparent drift in vertical -axis gyroscope will be
 - a. Maximum
 - b. Minimum
 - c. Zero *
 - d. Both a. and b.
26. When the plane of rotation of gyro is coincident with that of earth, apparent drift will be
 - a. Minimum
 - b. Maximum
 - c. Zero *
 - d. None of these
27. When free gyroscope is controlled for drift and transport wander, the gyroscope resulted is
 - a. Space
 - b. Earth *
 - c. Tied
 - d. None of these
28. Drift relates to
 - a. Horizontal axis-gyroscope *
 - b. Vertical axis-gyroscope
 - c. Spin axis discounted-gyroscope
 - d. None of these
29. The control of gyro wander is normally achieved by using
 - a. Sensor
 - b. Magnetic sensing devices
 - c. Gravity-sensing devices *
 - d. Both a. and b.
30. When spin-axis becomes coincident with one or other axis of freedom, following will occur
 - a. Gimble tick
 - b. Topple
 - c. Apparent drift
 - d. Both a. and b.*
31. Gimble error occur in
 - a. Horizontal axis-gyroscope *
 - b. Vertical axis gyroscope
 - c. Both a. and b.
 - d. None of these
32. Whenever gyroscope as a whole is displaced with its gimbal rings not mutually at right angles to each other
 - a. Gimble lock will occur
 - b. Gimble error will occur *
 - c. Gyro drift will occur
 - d. Both a. and b.
33. Principle methods used to rotate rotor of gyroscope in flight is
 - a. Pneumatic
 - b. Electric
 - c. Hydraulic
 - d. Both a. and b.*
34. In pneumatic or Air driven gyro rotor, the air is impinged on
 - a. Gimble ring
 - b. Bucket on rim of rotor *
 - c. Buckets on centre of rotor
 - d. None of these
35. In electrical driven gyro Ac motors are currently used to
 - a. Turn and Bank Indicator
 - b. Gyro Horizon *
 - c. Both a. and b.
 - d. None of these
36. Pitch and Roll attitude of A/C is indicated by gyro horizon in relation to
 - a. Horizontal axis *
 - b. Vertical axis
 - c. Both a. and b.
 - d. None of these
37. In Gyro horizon, rotor casing is formed by
 - a. Inner gimble ring *
 - b. Outer gimble ring
 - c. Both a. and b.
 - d. None of these
38. In Gyro horizon, inner gimble ring is deigned to
 - a. A/C longitudinal axis
 - b. A/C lateral axis *
 - c. A/C vertical axis
 - d. None of these
39. For adusting the Pitch trim adjustment in Gyro horizon, setting knob moves
 - a. Element symbolising A/C *
 - b. Horizon bar
 - c. Pitch drum
 - d. Both a. and b.
40. Freedom of gimble movement about roll and pitch axis is
 - a. 85° and 360° respectively
 - b. 85° and 300° respectively
 - c. 360° and 85° respectively *
 - d. 300° and 85° respectively
41. Freedom of pitch axis is restricted to prevent
 - a. Gimble error
 - b. Gimble lock *
 - c. Gyro precession
 - d. Both a. and b.
42. In pneumatic type Gyro horizon, upper bearing of the rotor is spring to loaded to
 - a. Compensate shock
 - b. Compensate temperature *

- c. Compensate friction
d. Both a. and b.
43. Roll pointer of the Gyro horizon is carried by
a. Outer gimble ring b. Back ground plat
c. Inner gimble ring d. Both a. and b.*
44. When viewed from top, rotor of Pneumatic driven Gyro Horizon rotates at
a. 15000 RPM in clock wise direction
b. 15000 RPM in anti-clock wise direction *
c. 25,000 RPM in clock wise direction
d. 25000 RPM in anti clock wise direction
45. Power supply to the electric driven gyroscope is
a. 28v DC
b. 115v,400Hz,3 phase AC *
c. 26v,400Hz, 3 AC
d. Both a. and b.
46. Type of motor used to drive rotor of electric gyroscope is
a. Squirrel cage b. Induction motor
c. Shunt type d. Both a. and b.*
47. Rotor of the motor running the gyroscope runs
a. Inside the stator windings
b. self running type
c. outside the stator winding *
d. Both a. and b.
48. Property of increased radius of gyration in electric driven gyroscope is achieved by running the gyro rotor
a. Inside the stator windings
b. self running type
c. outside the stator winding *
d. Both a. and b.
49. Rotor of electric driven gyroscope runs at
a. 15,000-18,000 RPM
b. 15,000-20,000 RPM
c. 20,000-23,000 RPM *
d. 20,000 -25,000 RPM
50. Solenoid operated warning flag in Gyro horizon is used to indicate
a. Gyro speed is more than specified
b. Power off *
c. Gyro speed is less than specified
d. None of these
51. The role of conventional gyro horizon along with flight director systems in current aircraft is as
a. Secondary b. Stand by
c. Primary d. Both a. and b.*
52. Gyro horizon when employed as stand by in a aircraft is fed with supply from
a. Static inverter b. Battery bus bar
c. A/C inverter d. Both a. and b.*
53. Graduation making of spherical element of stand by Gyro horizon is in step of
a. 10° * b. 20°
c. 30° d. 5°
54. Upper half of the spherical element is graduated from 0° to
a. 90° b. 180°
c. 80°* d. 85°
55. Lower half of the spherical element is graduated from 0° to
a. 45° b. 60°*
c. 90° d. 180°
56. A knob provided in the lower right hand corner of the stand by attitude indicator, serves the purpose of
a. Fast erection
b. Pitch trim adjustment
c. None of these
d. Both a. and b.*
57. Maximum pitch trim, which can be adjusted in a stand by attitude indicator is
a. ± 5° * b. ± 10°
c. ± 20° d. ± 30°
58. To activate fast erection in stand by attitude indicator, the knob is
a. Pushed in b. Pulled out *
c. Pushed in and rotated d. Both a. & c.
59. To carry out pitch trim adjustment in stand by attitude indicator, the setting knob is
a. Pulled out and rotated
b. Pushed in and rotated *
c. Normally rotated
d. None of these
60. Purpose of erection system in Gyros is to
a. Keep the rotor running
b. Minimise the gimble error
c. Keep the spin axis vertical *
d. Both a. and b.
61. When gyroscope is to normal vertical condition , the knife edge of vanes of erection system makes all four openings
a. Totally closed b. Totally opened
c. Equally opened * d. None of these
62. Steel ball type erection unit is employed in
a. Electric gyro horizon
b. Mechanical system type
c. Electrical system type
d. Both a. and b.*
63. The rotational speed of steel ball holder in erection system is
a. 25 RPM * b. 250 RPM
c. 2500 RPM d. None of these

64. The lateral mounted levelling switch in Gyro horizon detects in roll axis is in
 a. Roll disturbance * b. Pitch disturbance
 c. Vertical disturbance d. Both a. and b.
65. Corrective force applied for the displacement detected in roll axis is in
 a. Roll axis b. Pitch axis *
 c. Vertical axis d. None of these
66. Disturbance in pitch axis is detected by the levelling switch mounted in
 a. Longitudinal axis * b. Lateral axis
 c. Vertical axis d. None of these
67. Levelling switch contains mercury or electrolyte and
 a. One electrode b. Two electrodes
 c. Three electrode * d. None of these
68. The stator of the roll torque motor is fixed to the outer ring of the gyroscope and its rotor is fixed to
 a. Outer gimble ring b. Inner gimble ring *
 c. Instrument casing d. None of these
69. During straight and level flight; the central electrode of the mercury levelling switch makes contact with
 a. Second electrode
 b. Third electrode
 c. None of the other electrode *
 d. Both a. and b.
70. Supply fed to the levelling switch is
 a. 115v AC to centre electrode *
 b. 115 AC to outer electrodes
 c. 28v DC to centre electrode
 d. 28v DC to outer electrodes
71. Voltage to the reference winding of the torque motor is fed through a capacitor for
 a. Improving the efficiency
 b. Shifting the current *
 c. Radio interference
 d. Both a. and b.
72. Control winding of torque motor of Gyro erection system has
 a. Capacitance in series
 b. Capacitance in parallel
 c. No capacitance *
 d. Inductance in series
73. Phase quadrature is said to
 a. V and I in same phase
 b. Out of phase alignment *
 c. 3 phase circuit
 d. 2-phase circuit
74. When Gyroscope is not in straight and level flight, the electrolytic solution type switches
 a. Makes contact with two electrodes only
 b. Brakes contact with two electrodes only
 c. Vary the resistance between electrodes *
 d. None of these
75. Electrodes immersed with more electrolyte in electrolytic solution type of leveling switch will cause, corresponding winding of motor to flow
 a. More current * b. Less current
 c. Same current d. Both a. and b.
76. System employed to quickly bring a titled gyro to vertical position is known as
 a. Fast erection system * b. Erection system
 c. Quick system d. Both a. and b.
77. Fast erection system should not be operated for more than
 a. 5 seconds b. 10 seconds
 c. 15 seconds * d. 1 minute
78. Limit imposed in electric driven horizon, to operate fast erection system is to avoid
 a. Toppling of gyro
 b. Overheating of stator coil *
 c. Overheating of Gyro rotor
 d. Both a. and b.
79. In certain types of Gyro horizon ,when fast erection operating knob is pressed
 a. Gimble system is mechanically caged *
 b. Gimble system is mechanically freed
 c. Gyro rotor is electrically caged
 d. Gyro rotor is electrically freed
80. Time taken for vertical gyroscope to take up its normal operating position under the control of erection system is known as
 a. Precession rate in inches/min
 b. Erection rate in deg/second
 c. Erection rate in inches/min
 d. Erection rate in deg/min *
81. Normal rate provided by some erection system for gyro horizon is
 a. 8°/min for pneumatic type and 3-5°/min for electric type *
 b. 3-5°/min for pneumatic type and 8°/min for electric type
 c. 3-5°/min for both pneumatic and electric type
 d. 8°/min for both pneumatic and electric type
82. Gimbaling effect in Gyro Horizon during aircraft turn causes falls indication about
 a. Roll axis b. Pitch axis
 c. Vertical axis d. Both a. and b.*
83. Error related to turning of an A/C in Gyro Horizon is
 a. Erection error b. Pendulosity error
 c. Acceleration error d. Both a. and b.*
84. Erection error in Gyro Horizon is compensated by
 a. Erection cut out
 b. Pitch bank compensation

- c. Fast erection switch
d. Both a. & b.*
85. To achieve a single constant error during turn in Gyro Horizon, gyro spin axis is inclined from vertical is
a. 1.6 or 2.5° b. 16° or 25°*
c. 0.6° or 1.5° d. None of these
86. In pneumatic type gyro horizon, the requirement of inclined spin axis of gyro, for turning error is achieved by
a. Impinging air jet
b. Athwarship mounted pendulous vanes *
c. Ventury tube
d. Longitudinal mounted pendulous vanes
87. In Gyro Horizon having levelling switch, the tilted spin axis of gyro is achieved by
a. Tilted roll levelling switch
b. Tilted rotor of roll motor
c. Tilted pitch levelling switch *
d. Tilted rotar of pitch motor
88. A pair of pitch erection cut out S/W are connected to torque motor in such a way that, under the influence of forces, main erection circuit is
a. Connected with control winding circuit
b. Disconnected with control winding circuit *
c. Fed with extra power supply
d. Disconnected with extra power supply
89. A pair of two electrolytic switch in pitch erection cut out system are mounted
a. Parallel to each other
b. Perpendicular to each other
c. At an angle to each other *
d. None of these
90. Roll erection cut out switches are arranged at an angle to differentiate between the centrifugal forces corresponding to
a. Roll and pitch
b. Pitch up and pitch down
c. Left and right turn *
d. None of these
91. Power supply given to a pair of electrolytic type cut-out switch is
a. 20 V.DC b. 26 V.AC *
c. 26 V.DC d. 28 V.AC
92. A pair of two electrolytic switches in pitch erection cut-out systems are to differentiate between
a. Acceleration force b. Deceleration force
c. Gravitational force d. Both a. and b.*
93. In some Gyro Horizon incorporated with mercury type levelling switch, disconnects the roll levelling switch during turn by
a. Roll levelling switch b. Pitch levelling switch
c. Fast erection switch d. None of these *
94. In some Gyro Horizon incorporated with mercury type levelling switch, disconnects the roll levelling switch during turn by
a. Roll levelling switch *
b. Pitch levelling switch
c. Solid state micro switch
d. Fast erection switch
95. In pitch roll erection system, pitch leveling switch disconnects roll erection switch when rate of turn causes centrifugal acceleration
a. Exceeding 0.18 g * b. Exceeding 1.8 g
c. Exceeding 981 g d. None of these
96. Centrifugal acceleration of more than 0.18 g in pitch roll erection switch system is achieved by
a. 10° tilt of pitch erection switch
b. 10° tilt of roll erection switch *
c. Both a. and b.
d. None of these
97. Instruments employing the inclined axis method of compensation in pitch roll erection system to base compensation on standard values of
a. Rate 1 turn at 200 mph speed *
b. Rate 2 turn at 400 mph speed
c. Rate 1 turn at 100 mph speed
d. None of these
98. Pneumatic operated direction indicator employs
a. Vertical axis gyroscope
b. Horizontal axis gyroscope *
c. Magnetic sensor
d. None of these
99. Pneumatic operated direction indicator takes reference from
a. Magnetic compass * b. Detector unit
c. Air traffic controller d. Both a. and b.
100. Rotor of the pneumatic driven gyroscope runs at a speed of
a. 10,000-12,000 RPM
b. 12,000-15,000 RPM
c. 12,000-18,000 RPM *
d. 10,000-15,000 RPM
101. Purpose of caging knob in pneumatic operated direction gyro is to
a. Prevent the inner ring to precess.
b. Rotate the outer ring
c. both a. and b.*
d. none of these
102. Gimbal ring balancing in pneumatic operated direction gyro to control earth rate error is achieved by a
a. Nut fastned to inner ring *
b. Nut fastned to outer ring
c. Nut fastned to gyro rotor
d. Both a. and b.

103. Drift adjustment by unbalancing the inner ring in pneumatic operated direction gyro is effective upto
 a. 90° of latitude b. 45° of latitude
 c. 60° of latitude * d. None of these
104. In pneumatic operated direction gyro, to achieve erection of spin axis, wedge plate is mounted on
 a. Inner gimble ring b. Outer gimble ring *
 c. Instrument casing d. Both a. and b.
105. Gimble error in pneumatic operated direction gyro does not depend upon
 a. Angle of climb, descent, roll
 b. Angle between rotor axis and A/C longitudinal axis
 c. Type of erection device employed *
 d. Both a. and b.
106. In pneumatic operated directional gyro, after manoeuvring of the aircraft in roll and pitch, it may cause an error due to
 a. Gimbaling effect b. False erection
 c. Gyro toppling d. Both a. and b.*
107. Type of gyro used in Turn and Bank indicator is
 a. Earth gyro b. Tied gyro
 c. Rate gyro * d. None of these
108. Gyro used in Turn and Bank indicator employs
 a. One gimble ring * b. Two gimble ring
 c. Three gimble ring d. None of these
109. Gyro employed in Turn and Bank indicator has freedom in
 a. Three axis b. Two axis
 c. One axis * d. None of these
110. Gimble ring of the gyro of Turn and Bank indicator are
 a. Free to rotate
 b. Controlled by restraining spring *
 c. Controlled by solenoid
 d. None of these
111. Spin axis of the gyro in Turn and Bank indicator is
 a. Horizontal b. In lateral axis
 c. Vertical d. Both a. and b.*
112. Gimble ring deflection in Turn and Bank indicator is
 a. More than 6° b. less than 6° *
 c. Up to 85° d. Full 360°
113. Rate 1 turn if Turn and Bank indicator means A/C turn
 a. 360°/min b. 180°/min *
 c. 90°/min d. 30°/min
114. Turn and Bank indicator employs
 a. Normal erecting device
 b. Fast erecting device
 c. No erecting device *
 d. Both a. and b.
115. Rotor of Turn and Bank indicator runs at a speed of
 a. 2000-4000 RPM b. 4,000-4,500 RPM *
 c. 5,000-10,000 RPM d. none of these
116. In Turn and Bank indicator, speed of rotor is importantly kept constant because
 a. It may over heat the rotor winding
 b. It will draw more power supply
 c. Precession of rotor is proportional to speed *
 d. Precession of rotor is inversely proportional to speed
117. Operation of bank indicator depends upon
 a. Centrifugal forces b. Gravitational force
 c. Rotor speed d. Both a. and b.*
118. When bank angle for a particular rate of turn is under bank, then bank indicator will show
 a. Skid * b. Side slip
 c. Ball in centre d. Both a. and b.
119. When bank angle for a particular rate of turn is overbanked, then bank indicator will show
 a. Skid b. Side slip *
 c. Ball in centre d. Both a. and b.
120. When centrifugal force and gravitational force acting on the ball of bank indicator are same, the position of ball will be
 a. In extreme left b. In extreme right
 c. In centre * d. None of these.
121. In pneumatic type Turn and Bank indicator, adjustment of gyroscope sensitivity is provided by
 a. A screw attached with bank indicator
 b. A screw attached with gimble ring
 c. A screw attached with rate control spring *
 d. Both a. and b.
122. Gimble ring movement in pneumatic type Turn and Bank indicator is restricted to
 a. 85°
 b. 90°
 c. Slightly more than full scale deflection *
 d. Slightly less than full scale deflection
123. Type of damping device used in pneumatic type Turn and Bank indicator is
 a. Eddy current type *
 b. Liquid fluid type
 c. Piston and air cylinder type
 d. Both a. and b.
124. Incorporation of damping device in Turn and Bank indicator
 a. Increases the sensitivity
 b. Gives dead beat indication *
 c. Improves the precession
 d. Both a. and b.
125. Precession or output axis of the Turn co-ordinator is set to

- a. 30° with respect to longitudinal axis *
 - b. 15° with respect to longitudinal axis
 - c. 30° with respect to lateral axis
 - d. 15° with respect to lateral axis
126. 30° setting of output axis in Turn co-ordinator makes the gyroscope sensitive in
- a. Rolling or banking
 - b. Turning
 - c. Gyro erection
 - d. Both a. and b.*
127. Turn co-ordinator employs
- a. Horizon bar
 - b. Miniature aircraft
 - c. Aircraft symbol *
 - d. Both a. and b.
128. Gyro rotor runs in Turn co-ordinator at a speed of
- a. 2000 RPM
 - b. 4000 RPM
 - c. 6000 RPM *
 - d. None of these
129. Type of annotation in Turn co-ordinator is
- a. Gyro off
 - b. No roll information
 - c. No-pitch information *
 - d. Both a. and b.
130. No pitch information annotation in Turn co-ordinator avoids confusion because its similarity in presentation with
- a. Direction gyro
 - b. Gyro horizon *
 - c. Turn and Bank indicator
 - d. None of these
131. Type of motor used in Turn co-ordinator is
- a. DC motor
 - b. Constant frequency AC-motor
 - c. Squirrel cage type
 - d. Both a. and b.*
132. Types of damping used in Turn co-ordinator is
- a. Silicon fluid
 - b. Graphite plunger in glass tube
 - c. Eddy current type
 - d. Both a. and b.*

CHAPTER-25

SYNCHRONOUS DATA TRANSMISSION SYSTEMS

1. Synchronous data transmission system is introduced to get
 - a. Direct reading
 - b. Remote indicating *
 - c. Precise reading
 - d. Pneumatic/mechanical indication
2. Synchro system consist of
 - a. Transmitter element
 - b. Receiver elements
 - c. Indicator with mechanism
 - d. Both a. and b.*
3. Synchro system is not employed in
 - a. Remote indicating compass
 - b. Flight director
 - c. Direction gyro *
 - d. Analogue type air data computer
4. Following does not come in the category of synchro system
 - a. Torque type
 - b. Resolver type
 - c. Control type
 - d. None of these *
5. 'TX' Abbreviation is used for
 - a. Torque transmitter *
 - b. Torque receiver
 - c. Control resolver
 - d. Control receiver
6. Abbreviation used for Torque receiver in synchro system is
 - a. CT
 - b. TR *
 - c. TDR
 - d. CX
7. Type of synchro used in detecting the oil or fuel pressure indication is
 - a. Torque type *
 - b. Resolver type
 - c. Control type
 - d. None of these
8. Torque type synchro is used in indicating
 - a. Control of drive motor
 - b. Remote indicating compass
 - c. Air flow control valve *
 - d. None of these
9. Signal of control type synchro system is
 - a. Amplified *
 - b. Not amplified
 - c. Phase corrected
 - d. None of these
10. Type of synchro system used in control of drive motor is
 - a. Torque type
 - b. Resolver type
 - c. Control type *
 - d. Differential type
11. Type of synchro which generally forms a part of servo mechanism is
 - a. Torque type
 - b. Control type *
 - c. Resolver type
 - d. Differential type
12. Type of synchro used for precise angular measurement is
 - a. Torque type
 - b. Control type
 - c. Resolver type *
 - d. Both a. and b.
13. Type of synchro which is used to represent polar co-ordinates of point is
 - a. Torque type
 - b. Control type
 - c. Resolver type *
 - d. Both a. and b.
14. Type of synchro used to convert polar co-ordinates into cartesian co-ordinates is
 - a. Torque type
 - b. Control type
 - c. Resolver type *
 - d. Differential type
15. Resolver type synchro doesnot measure the
 - a. Fuel pressure
 - b. Oil pressure
 - c. Remote indicating compass
 - d. Both a. and b.*
16. Type of synchro used in remote indicating compass is
 - a. Torque type
 - b. Resolver type *
 - c. Control type
 - d. Differential type
17. Type of synochro used in the application of Analogue computer is
 - a. Resolver type *
 - b. Differential type
 - c. Torque type
 - d. Control type
18. Type of synchro used in indicating sum or difference of angles is
 - a. Torque type
 - b. Resolver type
 - c. Differential type *
 - d. Control type
19. Differential type synchro cannot be utilized in conjunction with
 - a. Torque type
 - b. Control type
 - c. Resolver type
 - d. None of these *
20. Windings on laminated states core are spaces
 - a. 60° apart
 - b. 120° apart *
 - c. 90° apart
 - d. None of these
21. Type of damping device used in TR of Torque synchro is
 - a. Mechanical *
 - b. Magnetic
 - c. Pneumatic
 - d. Eddy current

22. Supply fed to the rotors of TR and Tx is
 a. DC supply b. single phase AC *
 c. Two phase AC d. Three phase AC
23. When testing a synchro for accuracy its datum is taken from
 a. Mechanical zero b. Electrical zero *
 c. Magnetic zero d. None of these
24. At electrical zero position of torque synchros, the induced voltages are
 a. Minimum and in phase with rotor
 b. Maximum and in phase with rotor *
 c. Minimum but 90° out of phase with rotor
 d. Maximum but 90° out of phase with rotor
25. At a position 90° from electrical zero, the induced voltages in torque synchro is
 a. Maximum and in phase with rotor
 b. Minimum and 90° out of phase with rotor
 c. Zero *
 d. None of these
26. At a position 180° from the datum, in torque synchro, the induced voltage is
 a. Minimum and in phase with rotor
 b. Maximum and in phase with rotor
 c. Minimum but out of phase with rotor *
 d. Maximum but out of phase with rotor
27. Induced voltage in torque synchro will be zero at a position
 a. 90° from datum b. 270° from datum
 c. 180° from datum d. Both a. and b.*
28. When Tx and TR rotors are in same angular position, current flow in stator winding is
 a. No current flows *
 b. Maximum current flows
 c. Current flows only in TR
 d. Current flows only in TX
29. When there is no current flow between stators of TR and Tx due to alignment of both; position is known as
 a. Zero position b. Null position *
 c. Neutral position d. None of these
30. During operation of Torque synchro, a torque which tends to misalign the rotor caused due to current flow in stator coil is overcome by
 a. Automatically b. Compensating coil
 c. Prime mover * d. None of these
31. When rotor connection of torque synchro are reversed, the output datum is
 a. Advanced by 180° * b. Advanced by 90°
 c. Advanced by 270° d. None of these
32. When cyclic shift is given to the connections of the stator in torque synchro, the output datum
 a. Advanced by 90° b. Advanced by 100° *
 c. Advanced by 240° d. None of these
33. When two leads of stator of torque synchros are interchanged,
 a. Electrical zero shifts by 180°
 b. Null position shifts by 180°
 c. Output rotor reverses direction of rotor *
 d. None of these
34. Control synchro system's function is to
 a. Produce a torque in receiver element
 b. Produce a error voltage signal in receiver element *
 c. Show algebraic sum of the two angles
 d. None of these
35. CT in synchro system signify
 a. Current transformer b. Control transmitter
 c. Control transformer * d. None of these
36. In control synchro system, AC power supply is fed to
 a. Rotor of Cx * b. Rotor of CT
 c. Stator windings d. Both a. and b.
37. In control synchro CT element; the stator winding coils are of
 a. Low impedance
 b. High impedance *
 c. Low temperature co-efficient
 d. High temperature co-efficient
38. CT element of control synchro operates as a single phase transformed with
 a. Stator winding as primary
 b. Rotor winding as secondary
 c. Stator winding as secondary
 d. Both a. and b.*
39. When rotor of CT element of control synchro is at 90° from its datum, it is at
 a. Electrical zero *
 b. Null position
 c. Maximum induced voltage
 d. None of these
40. Error voltage signal of CT rotor is supplied to
 a. Amplifier b. Control phase
 c. Reference phase d. Both a. and b.*
41. In some servo mechanism, servo motor drives a tachogenerator for
 a. Improving the amplifier efficiency
 b. Controlling the rate of servomotor rotation *
 c. Creating an error signal
 d. None of these
42. Rotor of differential synchro has
 a. One stator connected winding
 b. Two stator connected windings
 c. Three stator connected winding *
 d. None of these

43. Differential synchro's detection of error signals of two angular position is achieved by introducing this synchro into
- Torque synchro
 - Control synchro
 - Resolver
 - Both a. and b.*
44. TDX designation indicate
- Differential synchro with control synchro system*
 - Differential synchro with torque synchro system
 - Torque transmitter
 - None of these
45. When differential synchro is utilized in control synchro, it is designated as
- TDR
 - TDX
 - CDX *
 - None of these
46. In TDX synchro system, when rotor of TDX is rotated by 15° clockwise and rotor of Tx is kept constant, the TR will have
- Rotor move anti clockwise by 15°
 - Stator move anti clockwise by 15°
 - Stator will remain at electrical zero
 - Both a. and b.*
47. To get algebraic addition of two inputs in TDX synchro system
- stator connections S_1 and S_2 of TX and TDX are inter changed
 - rotor connection R_2, R_3 of TDX are interchanged with stator connections S_2, S_3 of TR
 - stator connection S_2, S_3 of TDX are interchanged with TR
 - both a. and b.*
48. In TDX synchro system, if rotor of TX is rotated clockwise by 30° and rotor of TDX is rotated anti clockwise by 30° ; the rotor of TR will move by
- 60° clockwise
 - 60° anticlockwise
 - will not move at all *
 - none of these
49. In TDX synchro system when two input and output leads are interchanged, then TR angle will be equal to
- Tx angle - TDX angle
 - Tx angle + TDX angle *
 - (Tx angle + TDX angle)
 - TDX angle - Tx angle
50. In TDX synchro system, when only two input leads are interchanged, then TR angle will be equal to
- TX angle - TDX angle
 - TX angle + TDX angle
 - (TX angle + TDX angle) *
 - TDX angle - TX angle
51. In TDX synchro - system, when only two output leads are interchanged, the TR angle will be equal to
- TX angle - TDX angle
 - TX angle + TDX angle
 - (TX angle + TDX angle)
 - TDX angle - TX angle *
52. In TDX synchro system, when all the connections are symmetrical, the TR angle will be equal to
- TX angle - TDX angle *
 - TX angle + TDX angle
 - (TX angle + TDX angle)
 - TDX angle - TX angle
53. A vector quantity having length 'r' and angle 'q' with X axis its cartesian co - ordinates will be
- $x = r \cos q$
 - $Y = r \sin q$
 - length = r and angle = q
 - both a. and b. are correct *
54. A vector quantity having length 'r' and angle 'q' with X axis; its polar co - ordinates will be
- $x = r \cos q$
 - $y = r \sin q$
 - length = r and angle = q *
 - both a. and b.
55. A resolver in synchro system has
- 4 - stator and 2 rotor winding
 - 3 - stator and 3 rotor windings
 - 4 - stator and 4 rotor windings *
 - none of these.
56. Out of four windings of Resolver synchro; one winding; is shorted out
- To improve accuracy
 - To limit spurious response
 - Both a. and b.*
 - None of these
57. In Resolver synchro, the maximum voltage is induced in the stator coil comes
- At right-angle with rotor flux
 - Aligned with rotor windings *
 - At 45° with rotor flux
 - None of these
58. In Resolver synchro, no voltage is induced in the stator coil comes
- At right angle to rotor flux *
 - Aligned with rotor winding
 - At 45° angle to rotor flux
 - None of these
59. In Resolver synchro, the movement of rotor at constant speed will induce
- Constant voltage
 - Sinusoidal voltage *
 - Maximum voltage
 - Minimum voltage
60. In Resolver synchro, the sinusoidal voltages induced in two stator coils due to constant movement of the rotor will be equal to
- $r \sin q$
 - $r \cos q$
 - Constant voltage
 - Both a. and b.*
61. In Resolver synchros, when input to two stator coils is given as $V_x = r \cos q$ and $V_y = r \sin q$ Then the output

will be

- a. $r^2 \sin^2 q$
 - b. $r^2 \cos^2 q$
 - c. Vector length (r) & angle (q) *
 - d. Both a. and b.
62. Synchrotel is generally
- a. WW torque CT
 - b. Interconnected with Cx synchro
 - c. Low torque RS
 - d. Both a. and b.*
63. Synchrotel is applied to more conventional type of control, system, where it serves as a
- a. Signal transmitting element *
 - b. Signal receiving element
 - c. Both a. and b.
 - d. None of these
64. In synchrotel, stator core carries 3-stator windings at
- a. 45° apart
 - b. 90° apart
 - c. 120° apart *
 - d. 180° apart
65. In synchrotel, following is not correct about the rotor
- a. Made of copper *
 - b. Hollow
 - c. Oblique
 - d. Rotates in air gap
66. In synchrotel, the rotor shafts supported
- a. In ball bearings
 - b. In roller bearings
 - c. In jewelled bearings *
 - d. None of these
67. In synchrotel; the rotor receives the displacement position of the element
- a. Electrically
 - b. Mechanically *
 - c. Both a. and b.
 - d. None of these
68. In a typical application of fluid pressure measurement, the synchrotel rotor is energised by
- a. 28v DC
 - b. 115v AC 400 Hz
 - c. 26 volts AC, 400 Hz *
 - d. 210v AC 50 Hz

CHAPTER - 26

DIGITAL COMPUTERS & DATA TRANSFER

1. 'Data highway' bus system in new technology types of aircraft carry data in
 - a. Analog format
 - b. Binary-coded format *
 - c. Both a. and b.
 - d. None of these
2. A device which uses circuits that responds to, and produces signals of two values of logic high and logic low is
 - a. Amplifier
 - b. Analog computer
 - c. Digital computer *
 - d. Simulator
3. A digital computer is capable of performing operation on data represented as a
 - a. Series of desecrate impulses
 - b. Bit format
 - c. Continuously varying data
 - d. Both a. and b.*
4. The CPU executes the
 - a. Datas
 - b. individual machine instructions *
 - c. analog
 - d. none of these
5. The binary-coded format of the program consists of an
 - a. Datas
 - b. Bit formats
 - c. Operation code *
 - d. Both a. and b.
6. A program tells the computer
 - a. What operation is to start with next
 - b. Which is the data to be operated on
 - c. How A/D or D/A to work
 - d. Both a. and b.*
7. The binary coded format of the program consists of
 - a. an operation code
 - b. An operand
 - c. Both a. and b.*
 - d. None of these
8. An operation code in binary -coded format of the program tells the computer
 - a. Which data to be operated on
 - b. What operation it is to start with next *
 - c. How instructions are formatted
 - d. How long process will run
9. The program together with procedures and associated documentation, forms
 - a. Computer
 - b. Hardware
 - c. Software *
 - d. Instructions
10. A software consists of
 - a. Procedures and associated documentation *
 - b. Primary memory
 - c. Secondary memory
 - d. CPU, ALU and Memory
11. A CPU in computer contains
 - a. Direct memory access (DMA).
 - b. Ram
 - c. No. of registers *
 - d. Rom
12. In CPU, register is used
 - a. To store a bit
 - b. To store instructions
 - c. To store memory
 - d. To store single byte *
13. Arithmetic logic unit (ALU) does not performs the following
 - a. Binary Arithmetic and Logic functions
 - b. Data manipulation
 - c. Timing and control section
 - d. None of these *
14. Fetching and execution of the instructions specified by a program is performed by
 - a. Input-Output
 - b. ALU *
 - c. Memory
 - d. None of these
15. Communication between the CPU and Memory and Input/Output ports is by means of a
 - a. Registers
 - b. Memory device
 - c. Computer highway *
 - d. None of these
16. Data bus, address bus and control bus are formed in
 - a. ALU
 - b. Computer highway
 - c. Input/Output device
 - d. Both a. and b.*
17. The term known , for a group of conductors carrying one bit per conductor is
 - a. Carrier
 - b. Data flow
 - c. Bus *
 - d. Bus bar
18. The datas associated with memory or input/output transfer are carried by
 - a. Load carrier
 - b. Data bus *
 - c. Data carrier
 - d. None of these
19. Word length in CPU is of
 - a. One byte
 - b. Eight bit
 - c. One bit
 - d. Both a. and b.*
20. A bus in CPU is usually
 - a. Uni-directional
 - b. Bi-directional *

- c. Tri-directional d. Multi-directional
21. Following is not true about CPU
 a. CPU can write data to be read by a memory
 b. All information transferred under program travels via CPU
 c. Data transfer over a single set of data lines
 d. None of these *
22. Location of memory or input/output ports involved in a transfer are specified by
 a. Control bus b. Data bus
 c. Data highway d. None of these *
23. If a bus contains 16 lines, a CPU gets the capability of addressing upto
 a. 16 individual locations
 b. 64 individual locations
 c. 65,536 individual locations *
 d. None of these
24. Control bus is
 a. Uni-directional b. Bi-directional *
 c. Multi-directional d. None of these
25. Control bus made up of individual control lines for CPU memory and
 a. Secondary memory
 b. Input/Output control *
 c. Load registers
 d. Both a. and b.
26. Device consists number of storage location for instruction words is
 a. Input/Output device b. Memory device
 c. ALU d. Bus bar *
27. Bit pattern of instruction words defines
 a. Speed
 b. Logical performance
 c. Specific functions to be performed *
 d. Both a. and b.
28. Bit patterns of the instruction word also defines
 a. Data words to be used for operation *
 b. Logical operation to be performed
 c. Both a. and b.
 d. None of these
29. Each memory word is given a numbered location, termed as
 a. Bit number b. Byte-number
 c. Address * d. None of these
30. RAM stands for
 a. Read Access Memory
 b. Right Access Memory
 c. Random Access Memory
 d. Random Access Memory *
31. Type of memory whose data can be changed by 'writing in' new data is termed as
 a. ROM b. ERAM
 c. RAM * d. EROM
32. Type of memory which is also known as read/write memory is
 a. RAM * b. ROM
 c. Primary memory d. Secondary memory
33. Type of memory, which contains binary information permanently is termed as
 a. RAM b. ROM *
 c. Primary Memory d. Secondary Memory
34. Datas stored in ROM
 a. Can be accessed of random
 b. Written during manufacture
 c. Can be changed by writing
 d. Both a. and b.*
35. Following comes under types of memory in computer
 a. Volatile b. Non-Volatile
 c. ROM * d. Both a. and b.
36. Following comes under classification of memory in computer
 a. RAM b. ROM
 c. Volatile * d. None of these
37. Class of memory which loses its data when power supply is switched off, is known as
 a. Volatile * b. Non-Volatile
 c. RAM d. Both a. and b.
38. When power supply is switch off non-volatile memory will
 a. Lose the data
 b. First loses than regains
 c. Retains its data *
 d. None of these
39. The capacity of memory is quoted in
 a. Bits b. Bytes
 c. Kilobits * d. Microbits
40. The term kilobits represents
 a. 1000 bits b. 1000 bytes
 c. 1024 bits * d. 8000 bits
41. A memory of 8192 bits will have, capacity of termed as
 a. 8192 bits b. 8192 bytes
 c. 8 k * d. 8000 bits
42. The number of addressable locations in memory is dependent on its
 a. No of output data lines
 b. No of input data lines
 c. Type of the memory
 d. Both a. and b.*

43. Number of addressable locations in memory is derived from the bit storage capacity
- Multiplied by number of data lines
 - Divided by number of data lines *
 - Added with number of data lines
 - Subtracted with number of data lines
44. If a 1 k memory has four data lines, it can address
- 1024 locations
 - 4096 locations
 - 256 locations *
 - None of these
45. No. of data lines are specified in
- ALU
 - Manufacture's data sheet *
 - CPU
 - Primary memory
46. Device used as interface between a computer and the source of input datas and subsequent output data is
- CPU
 - ALU
 - Memory
 - Input/Output ports *
47. Input/Output ports are generally under the control of the
- ALU
 - CPU *
 - Primary memory
 - Secondary memory
48. More sophisticated I/O units can recognize signal from extra peripheral devices called
- Supplements
 - Additional I/O
 - Interrupts *
 - None of these
49. More sophisticated I/O units employing interrupts can change
- The speed
 - The sequence of operation of the program *
 - The memory capacity
 - Both a. and b.
50. In some cases, more sophisticated I/O units permit direct communications between memory and
- ALU
 - An internal peripheral device
 - An external peripheral device *
 - Both a. and b.
51. When more sophisticated I/O units performs direct communication between memory and external peripheral device, it doesnot interference
- I/O device
 - CPU *
 - ALU
 - None of these
52. In more sophisticated I/O units, when direct communication between memory and external peripheral device by pass CPU , function is called
- Random Access Memory
 - Direct Access Memory *
 - Read External Memory
 - Both a. and b.
53. When CPU is by passed in direct communication of memory and external peripheral device, the function is called
- RAM
 - ROM
 - EPROM
 - None of these *
54. Computer can understand
- Any langauge
 - Data language
 - Machine language *
 - Both a. and b.
55. Machine language is
- Binary coded language *
 - Bytes language
 - Signals
 - None of these
56. Digital code is called
- Bytes
 - Registers
 - Memory
 - Machine code *
57. Abbreviation for what the instruction of a program does in computer is
- Sequence
 - Mnemonic *
 - Instructor
 - Schedule
58. Programming with mnemonic instructions is called
- Set of instructions
 - Machine language programming
 - Assembly language programming *
 - Instructions programming
59. The conversion of statements to machine code is done by computer program called
- Interpreter
 - Compiler
 - Assembler
 - Both a. and b.*
60. Encoding function transforms.data from
- Analog to digital *
 - Digital to analog
 - Modulation to de-modulation
 - Both a. and b.
61. Decoding function transforms data from
- Analog to digital
 - Digital to analog *
 - Modulation to de-modulation
 - None of these
62. Simultaneous conversion of set of instructions to machine code is done by computer program known as
- Interpreter
 - Compiler *
 - Assembler
 - None of these
63. Step by step conversion of the instruction into machine language is done by a computer program known as
- Interpreter *
 - Compiler
 - Assembler
 - None of these
64. Conversion of our assembly language into the binary coded language is done by
- Interpreter
 - Compiler
 - Assembler *
 - Both a. and b.

65. Encoding and Decoding of data is performed by
 a. Amplifier
 b. Variable resistance
 c. Integrated logic circuit *
 d. None of these
66. 'Staircase' transfer characteristic is found in
 a. D/A converter b. A/D converter *
 c. Both a. and b. d. None of these
67. For the D/A converter, type of correspondence between input and output to
 a. One-to-one * b. One-to-many
 c. Many-to-one d. None of these
68. Analog input quantized into number of levels corresponding to the number of 'bits' resolution by
 a. Strair case transfer *
 b. Step up transfer characteristic
 c. Step down transfer characteristic
 d. None of these
69. Automatic flight control system operates in conjunction with
 a. INS,ADC,FDS
 b. Radio navigational system
 c. None of these
 d. Both a. and b.*
70. Pairs of wire in each data bus are
 a. Shielded b. Twisted
 c. Co-axile d. Both a. and b.*
71. All outgoing encoded data from the computers are identified by an additional binary coded word called
 a. Binary b. Bit
 c. Label * d. None of these
72. Binary coded word 'label' takes up the
 a. Last eight bit of each word
 b. First eight bits of each word *
 c. Both a. and b.
 d. None of these
73. Bits taken up by the 'label' are
 a. Hexa-decimal b. Octal coded *
 c. Both a. and b. d. None of these
74. Octal coded word has an base of
 a. 2 b. 8 *
 c. 16 d. None of these
75. Hexa decimal coded word has an base of
 a. 2 b. 8
 c. 16 * d. None of these
76. Binary coded word has an base of
 a. 2 * b. 8
 c. 16 d. None of these
77. Designation of labels to particular functions is arranged by
 a. Aircraft user
 b. Aircraft manufacturer *
 c. Both a. and b.
 d. None of these
78. Designation of label to particular functions is arranged in accordance with
 a. Captains desire
 b. Aircrew's requirements
 c. Standard specification *
 d. Both a. and b.
79. A specification accepted as an air transport industry standards reference for the transfer of digital data is known as
 a. ARINC-400 b. ARINC-429 *
 c. ARINC-529 d. ARINC-500
80. ARINC stands for
 a. Air radio incorporated
 b. Aeronautical radar incorporated
 c. Aeronautical radio incorporated *
 d. None of these
81. ARINC-429 may includes
 a. One single label only *
 b. Some duplication of label also
 c. Both a. and b.
 d. None of these
82. Systems providing data outputs are referred as
 a. Receiver b. Transmitter *
 c. Interpreter d. Both a. and b.
83. The maximum number of receivers that can be connected to the same bus line is
 a. One b. Two
 c. Twenty * d. None of these
84. Shielding of the wires comprising each data bus is connected to
 a. Ground
 b. Particular branch to receiver
 c. Both a. and b.*
 d. None of these
85. Digital computers of the different aircraft systems process data in the term of
 a. Specific messages
 b. parallel binary word
 c. Both a. and b.*
 d. None of these
86. The messages of digital computers of the different aircraft systems are converted and transmitted in
 a. Parallel form b. Serial form *
 c. Both a. and b. d. None of these

87. The reason for conversion and transmission of digital computers of different aircraft in serial form is to
- reduce the weight of transmission line
 - Improve the reliability
 - Both a. and b.*
 - None of these
88. Serial messages of digital computers are adopted into high and low voltage level and transmitted along the data bus lines in the form of
- Bytes
 - Bits
 - Pulse
 - Strings of pulses *
89. Each word of system as per ARINC 429 specification is formed of
- 8 Bits
 - 16 Bits
 - Pulse
 - Strings of pulses *
90. First eight bit of a word, represents
- Parity
 - Data
 - Label *
 - None of these
91. Source of the message in a 32 bit word is represented by
- Data
 - Parity
 - Label *
 - None of these
92. Data, is represented in a 32-bit word by
- First 8 bit
 - Last one bit
 - Last 8 bit
 - None of these *
93. Parity, sign and status in a 32-bit word is represented by
- First-8 bit
 - First-4 bit
 - Both a. and b.
 - None of these *
94. Parity in a 32- bit word is represented by
- First -8 bit
 - First-4 bit
 - Last bit *
 - Last 4 bit
95. SDI in a 32- bit word represents
- Serial distance identity
 - Series destination identifier *
 - Series differential identification
 - None of above
96. SDI in a 32-bit word is applied when
- Specific words need to be directed to a specific system in multi system installation
 - Source system is required to be known from word contact
 - Both a. and b.*
 - None of these
97. In a 32 bit word of a digital computer of different A/C systems the actual data being transmitted by
- Bits 1 to 8
 - Bits 24 to 32
 - Bits 11 to 29 *
 - None of these
98. The group of binary (1's and 0's) in bits 11 to 29 of a 32-bit word correspond to particular system
99. Bit 30 and 31 of a word is assigned to what is termed the
- Sign/Status matrix (SSM) *
 - Label
 - Parity
 - Data
100. Bit 30 & 31 of a word refers to
- Plus, minus of numeric data
 - North, South of numeric data
 - Numeric data value
 - Both a. and b.*
101. Plus, minus, north, south, left, right, etc of a binary coded decimal numeric data are referred by
- Label
 - Data
 - SSM *
 - Parity
102. Sign / status matrix (SSM) also refers to the
- Validity of data
 - Failure warning
 - Both a. and b.*
 - None of these
103. Detection of errors in codes are carried out by
- Data check
 - Parity check *
 - Label check
 - None of these
104. Parity check method is provided to check whether
- Label is changed
 - Parity is changed
 - Bits in binary word is changed *
 - Both a. and b.
105. Parity check is done by summation of bits of word to determine total number is
- Odd
 - Even
 - Both a. and b. *
 - None of these
106. The form of parity adopted by ARNIC-429 specification 429 is
- Odd
 - Even
 - Both a. and b.*
 - None of these
107. In digital computer data transmitted in batches at high speed of
- 12-14.5 Kilobits/sec
 - 100 Kilobits/sec *
 - 1000 Kilobits/sec
 - None of these
108. In digital computer data transmitted in batches at low speed of
- 12-14 Kilobits/sec *
 - 100 Kilobits/sec
 - 1000 Kilobits/sec
 - None of these
109. In digital computer, data are transmitted in batches
- At low speed
 - At high speed
 - At constant speed
 - Both a. and b.*
110. A standard specification of comparatively recent origin is the

- a. ARINC-429 b. ARINC-629 *
c. ARINC-600 d. ARINC-777
111. DATA C stands for
a. Data transfer accumulator
b. Digital autonomous terminal access communication *
c. Digital Air terminal and control
d. None of these
112. ARINC-629 is a
a. One way bus b. Two way bus *
c. Both a. and b. d. None of these
113. Data bus system DATAC is conceived by
a. Boeing-737 b. Boeing-727
c. Boeing-777 * d. Both a. and b.
114. Which of the following can transfer the data at fastest rate
a. ARINC-429 b. ARINC-629 *
c. Both a. and b. d. None of these
115. Stair case transfer characteristics is adopted for
a. Converting analog signal to digital *
b. Converting digital signal to analog
c. Both a. and b.
d. None of these
116. INS stands for
a. Internal navigational system *
b. Instrument navigational system
c. International navigational system
d. None of these
117. ADC stands for
a. Air data computer *
b. Aeronautical data center
c. Air data center
d. None of these
118. Following bit will referred to the 2466.2 feet data of radio altitude in a digital computer's word of 32-bits
a. Bits 1 to 8 b. Bits 9-10
c. Bits 30-31 d. None of these *
119. Following bit will referred to 'Radio Altitude' system in a digital coomputer's word of 32 bits
a. Bits 1-8 * b. Bits 9-10
c. Bits 30-31 d. None of these

CHAPTER - 27

AIR DATA COMPUTERS

1. Term relates to the sensing and transmission of Pitot and static pressure
 - a. Pressure data
 - b. Air data *
 - c. Pitot data
 - d. Static data
2. Air data does not include the following pressure
 - a. Air speed
 - b. Altitude
 - c. ROCI
 - d. None of these *
3. Pitot-static system having Air data computers, takes pitot-static pressure from
 - a. Pitot probe directly
 - b. Static vent directly
 - c. Centralized ADC *
 - d. Both a. and b.
4. Pitot-static pressure to the systems is supplied by ADC in
 - a. Pneumatic quantity
 - b. Pitot quantity
 - c. Electrical quantity *
 - d. Static quantity
5. Pitot-static pressure of an aircraft is converted into equivalent electrical signal by
 - a. Digital computer
 - b. Air data computers *
 - c. Both a. and b.
 - d. None of these
6. Advantages of Air data computer is to have integrated
 - a. Modules of principal datas *
 - b. Module of oxygen pressure
 - c. Module of brake pressure
 - d. Both a. and b.
7. Integrated modules of principal data is an advantage in Air data computer for
 - a. Correction of PE
 - b. Barometric pressure change
 - c. Correction of A/C attitude
 - d. Both a. and b.*
8. Modules of principal data in Air data computer are made by
 - a. Integrating the circuit *
 - b. Amplifying the data
 - c. Calibrating the ADC
 - d. None of these
9. For correction of position error and barometric pressure change in Air data computers
 - a. Mode selector are provided
 - b. Modules are designed *
 - c. Calibrating knob is provided
 - d. None of these
10. Intigrated module of principal data in ADC automatically appears correction for
 - a. Change in barometric pressure
 - b. Compressibility
 - c. Change direction of A/C
 - d. Both a. and b.*
11. In corporation of ADC in an aircraft
 - a. Increases the amount of plumbing
 - b. Decrease the amount of plumbing *
 - c. Both a. and b.
 - d. None of these
12. In Air data computer, provision can also be made for calculation of True air speed
 - a. Presure sensing amplifier
 - b. Engine temperature data
 - c. Air temperature data *
 - d. Both a. and b.
13. Air temperature data in ADC is provided for calculation of
 - a. True air speed *
 - b. Calibrated air speed
 - c. Equivelent air speed
 - d. None of these
14. Air data computer can be
 - a. Analog type
 - b. Digital type
 - c. Synchros
 - d. Both a. and b.*
15. Following does not utilize the Air data input
 - a. FDS
 - b. Altitude reporting
 - c. Ground proximity warning
 - d. Accelerometer *
16. Following takes the signal from Air data computer
 - a. Accelerometer
 - b. Flight director *
 - c. Hydraulic accumulator
 - d. Both a. and b.
17. Following is not the module of Air data coomputer
 - a. Altitude module
 - b. CAS module
 - c. TAS module
 - d. None of these *
18. TAS module is a term used in
 - a. Digital computer
 - b. Anolog computer
 - c. Air data computer *
 - d. Both a. and b.
19. Out put of position error correction network in Air data computer is fed to
 - a. (pitot-static.pressure)
 - b. Log(pitot-static. pressure)
 - c. Static pressure
 - d. Both a. and b.*

20. Output of position error correction network in Air data computer is fed to
 a. Vertical speed module
 b. True Air speed module
 c. Mach module *
 d. Both a. and b.
21. Parameter from Total Air Temperature (TAT) probe is given to
 a. Mach module * b. CAS module
 c. Altitude module d. VAS module
22. Out put of altitude module in air data computer is equivalent to
 a. Pitot pressure
 b. Log (static pressure) *
 c. Log (pitot-static) pressure
 d. (pitot-static) pressure.
23. In air data computer P_t =pitot pressure and P_s = static pressure, then $\frac{P_t - P_s}{P_s}$ is the output of
 a. Altitude module b. CAS module
 c. Mach module * d. TAS module
24. In aircraft-having ADC pipe lines from pitot/static probe are connected
 a. Directly to indicators
 b. To pressure transducers *
 c. To servo motor
 d. None of these
25. Transducers are of
 a. Electro-mechanical type *
 b. Electrolytic type
 c. Electrostatic type
 d. None of these
26. Force balance transducer has
 a. Capsule type sensor b. E & I bar pick off
 c. Two free weight d. None of these *
27. Constructional feature of a system transducers is
 a. Fixed for all type
 b. Depends upon manufacturer *
 c. Both a. and b.
 d. None of these
28. E-bar of an pick off has
 a. AC supply * b. DC supply
 c. Both a. and b. d. None of these
29. AC input supply the E & I-bar pick off is given to
 a. Upper limb of E-bar b. Lower limb of E-bar
 c. Centre limb of E-bar * d. I bar
30. Input windings in E & I bar pick-off are wound
 a. An E-bar only * b. An I-bar only
 c. Both a. and b. d. None of these
31. Output winding in a E & I-bar pick-off are wound
 a. On E-bar only * b. On I-bar only
 c. Both a. and b. d. None of these
32. Center limb of E-bar in E & I-bar pick off are
 a. Input winding * b. Output winding
 c. Both a. and b. d. None of these
33. Both the outer limbs of E-bar in E & I-bar pick off are wound with
 a. Input winding b. Output winding *
 c. Both a. & b. d. None of these
34. I-bar of E & I pick-off is
 a. Wound with input winding
 b. Moves mechanically with sensor *
 c. Wound with output windings
 d. None of these
35. In E & I-bar pick off, barometric pressure sensing capsull is mechanically connected to
 a. E-bar b. I-bar *
 c. Both a. and b. d. None of these
36. E & I-bar type of pick-off works on the principle of
 a. Varying resistance b. Varying inductance *
 c. Varying capacitance d. None of these
37. In E & I-bar pick off; when I-bar is moved because of varying parameter, it will vary the
 a. Resistance of coils
 b. Air gap between I-bar and outer limb *
 c. Air gap between I-bar and centre limb
 d. None of these
38. I-bar of E & I-bar pick-off is also inter-connected with a
 a. Amplifier b. Power source
 c. Servomotor * d. Both a. and b.
39. I-bar of E & I-bar pick off is also interconnected with a servomotor is via
 a. Electrical wire b. Torsion bar *
 c. Amplifier d. None of these
40. I-bar of E & I-bar pick off interconnection with a servomotor is via
 a. Gear train * b. Amplifier
 c. Both a. and b. d. None of these
41. In force balance transducers servomotor also forms part of the synchro system appropriate to the
 a. Computed air speed b. Altitude module
 c. Mach module d. Both a. and b.*
42. Output of secondary winding of E & I-bar pick off of force balance static pressure transducers will be zero during
 a. Pressure change
 b. In static condition *

- c. When input supply is constant
d. None of these
43. Out of balance signal induced in secondary winding of E & I-bar pick-off is applied to the
a. Amplifier b. Servomotor
c. Both a. and b.* d. None of these
44. To back-off the signals induced in the secondary coils of force balance transducer, the device employed is
a. Cam follower b. Torsion bar
c. Both a. and b.* d. None of these
45. Solid state circuit device type of pressure transducers utilizes
a. Electrostatic effect b. Piezoelectric effect *
c. See backs effect d. Platier's effect
46. Piezo electric effect is utilised in mostly
a. Temperature sensor b. Speed sensor
c. Pressure sensor * d. Altitude sensor
47. Piezoelectric effect is relates induced voltage with
a. 'Temperature' b. 'Engine speed'
c. 'Pressure' * d. None of the above
48. Generation of electrical signal by certain crystalline materials subjected to pressure is known as
a. Thomson effect b. Joules effect
c. Piezo electric effect * d. Peltier's effect
49. Transducer utilizing piezo-electric effect device incorporates
a. Quartz disc without metallic deposit
b. Quartz disc with metallic deposit *
c. Negative co-efficient resistance wire
d. None of these
50. The polarity of the induced voltage is a device working piezo electric effect will depend upon
a. Polarity of the input supply
b. Increasing and decreasing of the pressure
c. Both a. and b.*
d. None of these
51. Increasing and decreasing of the pressure on the flex of the piezo-electric crystal will determine the
a. Amplitude
b. Polarity of induced voltage
c. Both a. and b.*
d. None of these
52. In case of computed air speed module, the servomotor, drives rotor of
a. TDR b. CX *
c. Both a. and b. d. None of these
53. In computed air speed module, the servomotor drives the rotor of CX synchro; in response to the
a. Cam follower b. Amplified o/p signal *
c. Both a. and b. d. None of these
54. In computed air speed module , the servomotor drives the rotor of
a. CX synchro b. RS synchro
c. TDR synchro d. Both a. and b.*
55. In computed air speed module, the servo motor drives the rotor of
a. Rotor of an RS * b. Stator of CT
c. TDX synchro d. None of these
56. In module operation of ADC static source error correction (SSEC) network originates in the
a. Altitude module b. TAS module
c. Mach module * d. CAS module
57. In module operation of ADC, static source error correction (SSEC), circuit of network is
a. Pre-adjusted * b. Post adjusted
c. Can not be adjusted d. None of these
58. In static source error correction (SSEC) network of computed the speed module , is pre-adjusted to corresponding
a. Position error *
b. Compressibility error
c. Density error
d. None of these
59. In static source error correction (SSEC) network of computed air speed module of ADC , the output of the pressure transducer circuit is the measure of
a. Pitot pressure * b. Static pressure
c. (pitot-static) pressure d. None of these
60. In computed air speed module of Air data computer, the servomotor and CX synchro rotor position are controlled to get compensated output for PE as a function of
a. Mach meter * b. Altimeter
c. ROCI d. Both a. and b.
61. In computed air speed module of ADC rate feed back signals to the control amplifier is fed by
a. Potentiometer b. Tachogenerator *
c. CT synchro d. None of these
62. In CAS module of air data computer, servomotor drives a techogenerator for
a. Rate feed back signal *
b. Negative feed back signal
c. Harmonic signal
d. None of these
63. In CAS module of air data computer , rate feed back signal from techogenerator is supplied to
a. Increase the input error voltage signal
b. Decrease the input error voltage signal *
c. Decrease the output error voltage signal
d. None of these
64. To prevent the overshooting of the servomotor in CAS-

- module operation
- a. Stopper is provided
 - b. Feed back signal is used *
 - c. Gear train is utilized
 - d. Cam follower is employed
65. Rate feed back signal to control amplifier is supplied in CAS module operation
- a. To increase the sensitivity
 - b. To reduce the voltage loss
 - c. To prevent overshooting of motor *
 - d. To prevent hunting of motor
66. Techogenerator in CAS module operation in ADC are driven by
- a. Amplifier
 - b. Servomotor *
 - c. Synchros
 - d. None of these
67. In CAS-module of air data computer, servomotor drives
- a. Techogenerator
 - b. Differential gearing
 - c. Transducer
 - d. Both a. and b.*
68. Signal output of the altitude module in ADC is the measure
- a. Pitot pressure
 - b. Static pressure *
 - c. pitot-static. pressure
 - d. Both a. and b.
69. The altitude module of air data computer is comprised of
- a. Servomechanism arrangement *
 - b. Static pressure
 - c. Both a. and b.
 - d. None of these
70. Altitude module in air data computer measures
- a. Rates of altitude change
 - b. Servo operated altitude
 - c. Both a. and b.*
 - d. None of these
71. In addition to supplying signals to servo-operated altimeter; the altitude module in ADC also determines
- a. Mach number
 - b. True air speed
 - c. Vertical speed *
 - d. Indicated air speed
72. Vertical speed in altitude module of ADC is measured in conjunction with
- a. Servo driven techogenerator
 - b. Intigrating amplifier
 - c. Differential amplifier
 - d. Both a. and b.*
73. Integrating amplifier in altitude module of ADC does the job of
- a. Feed back to servomotor
 - b. Mathematical operation *
 - c. Both a. and b.
 - d. None of these
74. Signals from servo driven techogenerator to the intigrating amplifier, in altitude module of ADC, measures
- a. Altitude
 - b. Vertical speed *
 - c. True air speed
 - d. Mach number
75. Integrated signals, in altitude module of ADC, are amplified and supplied to
- a. Pneumatic operated VSI
 - b. Servo operated machmeter
 - c. Servo operated VSI *
 - d. None of these
76. In altitude module of ADC vertical speed (v/s) mode select forms the part of
- a. Pitch channel of auto flight control *
 - b. Flight director system
 - c. Roll channel of auto flight control
 - d. Both a. and b.
77. In altitude module of ADC, following forms the part of pitch channel of auto flight control & FDS
- a. v/s mode select *
 - b. Alt mode select
 - c. Mach mode select
 - d. None of these
78. Indication of speed in terms of mach number can be derived by measuring the pressure
- a. Pitot
 - b. Static
 - c. Pitot -static
 - d. pitot-static./static *
79. The ratio of difference of pitot and static pressure to the static pressure measures the
- a. True air speed
 - b. Vertical air speed
 - c. Speed in terms of mach number *
 - d. None of these
80. The ratio of difference of pitot & static pressure to the pressure to measure mach number in mach module is achieved by
- a. Synchronous transmission
 - b. Servomechanism
 - c. Integrating amplifier
 - d. Both a. and b.*
81. In mach-module of ADC; while measuring the three parameters, the dividing function is done by
- a. Differential synchro *
 - b. Torque synchro
 - c. Both a. and b.
 - d. None of these
82. In mach-module of ADC, the differential synchro in torque synchro system perform the
- a. Multiplying function
 - b. Dividing function *
 - c. Subtracting function
 - d. None of these
83. In module operation of ADC, differential synchro (TDX) is part of
- a. CAS module *
 - b. Altitude module
 - c. Mach module
 - d. None of these

84. In module operation of air data computer the TX synchro is in
 a. Altitude module * b. CAS module
 c. Mach module d. None of these
85. In module operation of Air data computer, the TR synchro is in
 a. Altitude module b. CAS module
 c. Mach module * d. None of these
86. CAS module of air data computer utilized the following synchro in computing the parameter
 a. TDX * b. TR
 c. CDX d. None of these
87. When altitude and CAS modules are in operation, the TX synchro rotor will be driven by transducer of
 a. Altitude module * b. CAS module
 c. Mach module d. None of these
88. Output signal of TDX synchro of CAS in module operation of ADC is transmitted to
 a. Altitude module b. CAS module
 c. Mach module * d. None of these
89. In module operation of ADC, the output signal of differential synchro (TDX) of CAS is transmitted to
 a. The potentiometer of mach module
 b. The control amplifier of mach module *
 c. Both a. & b.
 d. None of these
90. In module operation of ADC, the output signal of differential synchro (TDX) of CAS is transmitted to control amplifier of mach module is a
 a. CX synchro b. TR synchro *
 c. RS synchro d. None of these
91. The servo mechanism arrangement of the mach module in ADC is the same as
 a. Altitude module b. CAS module
 c. Both a. and b.* d. None of these
92. In mach module of ADC, CX synchro transmits signals in terms of mach number to a
 a. Control amplifier
 b. Digital computer *
 c. Both a. and b.
 d. None of these
93. 'Nulling out' of signal in mach module, under constant speed and altitude condition is obtained by driving the
 a. TR synchro rotor
 b. Servomotor
 c. Differential synchro
 d. Both a. and b.*
94. For the measurement of true air speed (TAS), it is necessary to utilize signals that are a measure
 a. Static air temperature
 b. Total air temperature *
 c. Static air pressure
 d. None of these
95. In module operation of ADC signals of total air temperature (TAT) are necessary in measuring
 a. Altitude
 b. Mach number
 c. Computer air speed (CAS)
 d. True air speed (TAS) *
96. In module operation of ADC, signals of total air temperature are generated by
 a. Sensing probe * b. Thermocouple
 c. Both a. and b. d. None of these
97. In module operation of ADC, signals from externally mounted TAT measuring sensing probe is fed to the
 a. TAT indicator b. TAS module
 c. Altitude module d. Both a. and b.*
98. Total air temperature signal in module operation of ADC is fed to mach module via
 a. Potentiometric network
 b. Integrating amplifier *
 c. Differential amplifier
 d. None of these
99. Potentiometric network in mach module of ADC, serves as a
 a. Function generator
 b. Produces TAS output signals
 c. Both a. and b.*
 d. None of these
100. Potentiometric signals, which serves as a function generator in producing TAS signal corresponds to the value of
 a. TAT b. Mach speed
 c. Altitude d. Both a. and b. *
101. Servomotor in TAS module also drives a 'follow-up' device for the purpose of
 a. Improving TAS signal
 b. Balancing out TAS signal *
 c. Neutralize altitude signal
 d. None of these
102. For balancing out incoming TAS signals in TAS module of Air data computer, servomotor drives.
 a. Drive gear assy b. Follow-up *
 c. Cam-flower d. None of these
103. In the event of loss of the respective data signal in a module operation of Air data computer, device used is
 a. Off flag b. Zebra marking flag
 c. Warning flag * d. None of these
104. Once the warning logic circuit network in modules of ADC is triggered, it

- a. Remains latch *
 b. Latch for 1 minute
 c. Latch-unlatch 15 seconds
 d. None of these
105. For warning indication of data failure in a module, annunciator light provided is
 a. Only one for all
 b. One each for all module *
 c. One for each two module
 d. One for only mach-module
106. Annunciator lights for data failure warning in a module of ADC are provided in
 a. Cockpit sealing
 b. Main instrument panel
 c. End panel of computer *
 d. None of these
107. Data failure warning device in Air data computer indicates
 a. ADC failure b. Module failure *
 c. Both a. and b. d. None of these
108. Electrically operated analog type indicators used in conjunction with ADC may contain
 a. Parameter sensor b. Servomechanism
 c. Both a. and b.* d. None of these
109. Servo loop of a module in Air data computer, complete with
 a. Servomechanism
 b. Particular electrically operated analog indicator
 c. Both a. and b.*
 d. None of these
110. Input to a particular electrically operated analog indicator utilizing Air data computer comes from
 a. Sensing probe b. Transducer
 c. Module * d. Both a. and b.
111. Air speed indicator incorporating both pressure sensing capsule and servomechanism, within the instrument, the computed air speed is indicated by
 a. Pressure sensing capsule
 b. Servomechanism *
 c. Both a. and b.
 d. None of these
112. Air speed indicator incorporating both servomechanism and pressure sensing element; the servo mechanism is used for
 a. Indicated air speed b. Computed air speed *
 c. Failure warning d. None of these
113. Servomechanism of electrically operated Air speed indicator operates in response to the signals supplied to its
 a. TDX synchro
 b. CT synchro *
 c. Differential amplifier
 d. Integrating amplifier
114. Signals from module in Air data computer is fed to following device in Air speed indicator
 a. TDX synchro
 b. CT synchro *
 c. Differential amplifier
 d. Integrating amplifier
115. In servo operated Air speed indicator following may be the one reason for coming of failure circuit in operation
 a. Excessive 'nulling' occurs
 b. Loss of power
 c. Both a. and b.*
 d. None of these
116. In servo operated Air speed indicator, following can be the reason to operate failure circuit
 a. Failure of data input from ADC
 b. Excessive 'nulling'
 c. Both a. and b.*
 d. None of these
117. Excessive 'nulling' in digital counter servo loop of servo-operated Air speed indicator causes
 a. Failure 'flag' on display
 b. Off flag on display counter
 c. Obscure of the display counter *
 d. None of these
118. In servo-operated Air speed indicator, to carry out checks of failure flag, device used is
 a. A switch on control panel
 b. A tester *
 c. A switch on instrument
 d. Both a. and b.
119. When CAS ON/OFF switch of indicated/computed air speed, indicator is put OFF, the counter type display will
 a. Remain open b. Get obscure *
 c. Indicate OFF d. None of these
120. In indicated /computed air speed indicator, the CAS ON/OFF switch is
 a. To adjust the pointer b. To set the counter
 c. To test the flag * d. Both a. and b.
121. Servo-operated air speed indicator is also used in conjunction with
 a. ILS b. An auto throttle *
 c. FDS d. None of these
122. Auto throttle system employed in conjunction with servo-operated air speed indicator to
 a. Adjusts the power setting of engines
 b. Maintain commanded air speed of A/C
 c. Both a. and b.*
 d. None of these

123. Adjustment of power setting of engines to maintain the commanded air speed of A/C system employed in conjunction with servo-operated air speed indicator is
- A/C throttle system
 - Auto throttle system *
 - CAS ON/OFF switch
 - None of these
124. In servo-operated air speed indicator, automatic flight control system, which can be selected by
- Mode select panel
 - Command set knob
 - Both a. & b.*
 - None of these
125. Command air speed circuit arrangement within the air speed indicator consist of
- CT synchro system
 - Synchrotel
 - Potentiometer
 - Both a. and b.*
126. In command air speed circuit arrangement within air speed indicator, speed set knob is mechanically connected to
- CT synchro system
 - Synchrotel *
 - Potentiometer
 - None of these
127. Under normal operating conditions the autothrottle system and the AFCS, command air speeds are set on
- Digital counter display
 - AFCS mode select panel
 - Both a. and b.*
 - None of these
128. Setting of command air speed also positions CX synchro rotor so that it can transmit signals for the purpose of
- Positioning the speed reference marker
 - Command speed indicator
 - Both a. and b.*
 - None of these
129. Putting out of command set knob of Air speed indicator causes the
- Disengaging the clutch *
 - Engaging the clutch in drive
 - Introduces the clutch in drive
 - None of these
130. In command air speed indicator, to dis-engage the clutch in drive, command set knob is to be
- Pushed in
 - Pulled out *
 - Rotate left
 - Rotate right
131. While pulling out the command set knob of Air speed indicator, a switch in CT synchro excitation circuit is held in
- Open position
 - Closed position *
 - Intermediate position
 - None of these
132. Servomotor in command air speed indicator is mechanically connected to
- TDX
 - Synchrotel *
 - CX
 - None of these
133. Indicated air speed mechanism of command air speed indicator is connected to synchrotel
- Electrically
 - Mechanically *
 - Both a. and b.
 - None of these
134. The error signal between indicated airspeed and commanded air speed is produced by
- Synchrotel transmitter *
 - Servomotor
 - Differential amplifier
 - None of these
135. The relative position of the rotor and stator of synchrotel transmit of command air speed circuit arrangement produces
- Amplifier signal
 - Error signal *
 - Rectified signal
 - None of these
136. Output of error signal generated between indicated air speed and command air speed is fed to
- Mach module of ADC
 - Autothrottle computer *
 - CAS module of ADC
 - Both a. and b.
137. Power output of engines are automatically adjusted to attain the
- Indicated air speed
 - Mach speed
 - Commanded air speed *
 - None of these
138. In command air speed indicator mechanism power output of engines are automatically adjusted by the
- Error signal from synchrotel *
 - Servo repeater
 - Servo motor
 - None of these
139. Command air speed , if set by the indicator, the set knob must be
- Pulled out
 - Pushed in *
 - Rotated without pulling/pushing
 - Both a. and b.
140. By pushing in the set knob of command air speed indicator
- Drive clutch is engaged *
 - Indicator test is carried out
 - Fast setting of pointer is done
 - Both a. and b.
141. When command air speed set knob is pushed in, it
- Opens the switch in excitation circuit
 - Engages the servo mechanism drive clutch *
 - Energies control winding of motor
 - Both a. and b.
142. Signals of command air speed to auto throttle system control are set in indicator by
- Pushing the set knob in
 - Rotating the set knob manually
 - Both a. and b.*
 - None of these

143. Rotation of command air speed set knob causes
- Positioning of synchrotel stator
 - Positioning of reference marker
 - Positioning of indicated air speed pointer
 - Both a. and b.*
144. While rotating the command air speed set knob the command air speed digital counter
- Rotated
 - Obscured by flag
 - Does not rotate
 - Both a. and b.*
145. While rotating the command air speed set knob, the command speed digital counter is obscured by
- Yellow flag
 - Yellow 'MAN' flag *
 - Black 'MAN' flag
 - White flag
146. Yellow 'MAN' flag obscures command air speed digital counter, when
- Power fails
 - Speed exceeds the value
 - Set knob is rotated *
 - None of these
- 146(A). Solenoid circuit of yellow 'MAN' flag isolates when command air speed set knob is
- Rotated
 - Pulled out *
 - Pushed in
 - Both a. and b.
147. Pushing in of command air speed set knob causes the solenoid circuit of yellow 'MAN' flag to be
- Engaged
 - Isolated
 - Energised *
 - None of these
148. In the event of when command air speed exceeding a certain value, the counter display is obscured by
- Yellow flag
 - Black flag *
 - Black 'MAN' flag
 - Yellow 'MAN' flag
149. Black flag obscures the counter display in command air speed indicator when
- Air speed exceeds *
 - Air speed exceeds the aircraft's limit speed
 - Both a. and b.
 - None of these
150. Mach / air speed indicator is used in conjunction with the indicator of
- Indicated air speed
 - Computed air speed
 - True air speed
 - Both a. and b.*
151. Digital computer of Mach /air speed indicator is operated by
- TDX synchro
 - RX synchro
 - CT synchro *
 - None of these
152. Pure servo operated Mach/air speed indicator may be used in conjunction with ADC of
- Analog type
 - Digital type
 - Both a. and b.*
 - None of these
153. Computed air speed in Mach/air speed indicator is displayed by a
- Digital counter
 - Distinctly shaped pointer
 - reference marker
 - Both a. and b.*
154. Distinctly shaped pointer of Mach/air speed indicator, indicates
- Mach number
 - Max mach number
 - Computed air speed *
 - True air speed
155. A stripped pointer in Mach/Air speed indicator is driven by
- Capsule mechanism
 - Servo mechanism
 - Both a. and b.*
 - None of these
156. A striped pointer in Mach/Air speed indicator, indicates
- V_{mo}
 - M_{mo}
 - Both a. and b.*
 - None of these
157. In servo-operated Mach/Air speed indicator, V_{mo} stands for
- Operating speed in knots
 - Max operating speed to knots *
 - Max operating speeds in terms of mach number
 - None of these
158. In servo-operated Mach/Air speed indicator the term M_{mo} stands for
- Mach number
 - Max operating speed
 - Max operating speed in terms of mach number *
 - None of these
159. In servo operated Mach/Air speed indicator, to rotate the speed reference knob, it has to be first
- Pulled out *
 - Pushed in
 - Simply rotate
 - None of these
160. In servo-operated Mach/Air speed indicator, 'memory bugs' are used to indicate
- Flying speed at that time
 - Mach number at that time
 - Certain operating speeds *
 - None of these
161. Certain operating speeds of particular A/C like-take-off speed, in Mach/Air speed indicator is shown by
- Stripped pointer
 - Air speed pointer
 - Memory bug *
 - Digital counter
162. Number of warning and indicating flags provided in Mach/Airspeed indicators are
- Two
 - Three
 - Four
 - Five *
163. Mach/Air speed indicator does not indicate the following
- Failure in air speed circuit
 - Failure in mach circuit

- c. Failure in v_{mo} and m_{mo}
 d. None of these *
164. 'INOP' flag in mach/air speed indicator comes on to indicate
 a. Digital counter is inoperative
 b. Speed reference marker is in operative *
 c. Both a. and b.
 d. None of these
165. In mach/airspeed indicator flag inconjunction with 'INOP' they indicate
 a. Auto setting of the mach-mechanism
 b. Auto setting of the speed reference marker
 c. Manual setting of the speed reference marker *
 d. None of these
166. In mach/air speed indicator, following flag indicates that speed reference marker is manually set
 a. 'INOP' flag b. M-flag *
 c. Yellow - 'MAN' flag d. None of these
167. Following is not the warning flag in mach/air speed indicator
 a. M-flag b. Yellow-MAN-flag
 c. INOP-flag * d. None of these
168. Power requirement for synchro-operation in Mach / air speed indicator is
 a. 26 VDC b. 26 V.AC *
 c. 28. V.DC d. 28.VAC
169. 28V.DC, power output from the power module of mach/air speed indicator is fed to the
 a. Servomotors b. Flag monitor
 c. Synchro d. Both a. and b.*
170. Power supply fed to the flag monitor circuit in mach/air speed indicator is
 a. 28V.DC * b. 26VDC
 c. Both a. and b. d. None of these
171. In Mach/Air speed indicator, the signals corresponding to computed air sped from the module are supplied to
 a. CT-synchro * b. RS synchro
 c. TDX synchro d. None of these
172. In Mach /Air speed indicator , the error signal of computed air speed is produced by
 a. RS-synchro b. CT-synchro *
 c. TDX synchro d. None of these
173. In Mach/Air speed indicator, the servo-motor also drives a potentiometer through a gear ratio of
 a. 1:2 b. 2:1 *
 c. 1:1 d. None of these
174. In Mach/Air speed indicator, the servomotor drives a synchro rotor to
 a. Create error signal
 b. Null-out the error signal *
- c. Both a. and b.
 d. None of these
175. In Mach/Air speed indicator, a DC signal to an "Anti-ambiguity circuit is given by
 a. Amplifier b. Potentiometer *
 c. Differential synchro d. None of these
176. The purpose of 'anti-ambiguity' circuit in Mach/Air speed indicator is to ensure that
 a. Air speed pointer does not go 120° out of NULL
 b. Air speed pointer does not go 180° out of NULL *
 c. Air speed reference knob is not rotated beyond max
 d. None of these
177. The purpose of synchro transmission loop in Mach/ Air speed indicator is to transmit
 a. CAS to auto-throttle system
 b. IAS to auto-throttle control system
 c. CAS to mach-module *
 d. None of these
178. For transmitting CAS to auto throttle system, device operates to Mach/Air speed indicator is
 a. Differential amplifier
 b. Synchro transmission loop *
 c. Synchro multiplexer
 d. None of these
179. Specially calibrated cam and follower in air speed pointer and counter mechanism of Mach/Air speed indicator is for
 a. Altitude compensation
 b. Square low compansation *
 c. Mach speed reference
 d. Both a. and b.
180. In Mach/Air speed indicator, to carry out square low compensation, of air speed pointer and counter drive mechanism, device incorporated is
 a. Banana slot
 b. Fish tail quadrant
 c. Cam and fallower *
 d. Calibrated spring and screws
181. Linearity of scale in air sped pointer indication of Mach/ Air speed indicator is accomplished by
 a. Rotation of cam
 b. Variation of magnification rate
 c. Compensation by differential amplifier
 d. Both a. and b.*
182. In Mach/Air sped indicator, signals from v_{mo} and overspeed processor circuit module is fed to
 a. Amplifier
 b. Max air speed pointer
 c. Mach counter
 d. Both a. and b.*
183. Max air speed pointer in Mach/Air speed indicator is

- driven by
- V_{mo}
 - Overspeed processor circuit module
 - Mach counter
 - Both a. and b.*
184. In Mach/Air speed indicator; the max air speed pointer for a higher scale reading than that of air speed pointer, is
- Always driven to
 - Both a. and b.
 - 'Nulled' out of *
 - None of these
185. Higher air speed signal in Mach/Air speed indicator will be detected when air speed pointer
- coincide max speed pointer *
 - Comes within 15 knots of max speed pointer
 - Goes beyond the max speed pointer
 - Both a. and b.
186. When both max air speed and air speed pointer, coincide the higher air speed signal is detected by
- V_{mo}
 - Overspeed processor
 - Mach module
 - Both a. and b.*
187. Solid state overspeed switch in Mach/Air speed indicator is for
- Giving correcting signal
 - Giving aural warning *
 - Operating mach module
 - Both a. and b.
188. Mach/Air speed oral warning is activated by
- Overspeed processor
 - Solid state overspeed switch *
 - Pitot-static probe
 - Both a. and b.
189. Mach number counter of Mach/Air speed indicator is driven by the signals from
- Computer air speed module of ADC
 - Altitude module of ADC
 - Mach module of ADC
 - Both a. and b.*
190. Signals form Altitude and computed air speed modules of ADC are fed in Mach/Air speed indicator to operate
- Striped pointer
 - Air speed pointer
 - Mach number counter *
 - Air speed counter
191. Altitude; and CAS signals from modules of ADC are fed in to the following device of the Mach/Air speed indicator
- De-multiplexer
 - Differential amplifier
 - Synchro multiplexer *
 - None of these
192. Servo motor driving mach-counter in Mach counter in Mach/Air speed indicator also drives a synchro, whose output is fed for 'nulling' the signal to
- De-multiplexer
 - Potentiometer
 - Multiplexer *
 - None of these
193. For automatic operation of autothrottle system, setting is made on
- AFCS mode selector panel
 - Display unit of performance data computer (PDC.
 - Both a. and b.*
 - None of these
194. Purpose of logic circuit provided in the speed reference system of Mach/Air speed indicator is to monitor the system (while reference knob is pushed in) for
- Loss of power *
 - Nulling of synchro/servo system
 - Both a. and b.
 - None of these
195. When reference knob of Mach/Air speed indicator is pulled out the monitor circuit will cause
- MANUAL flag to disappear
 - Manual flag to appear *
 - Mach flag to appear
 - 'INOP' flag to disappear
196. Yellow-Off flag in Mach/Air speed indicator comes in conjunction with mechanism of
- True air speed.
 - Both a. and b.*
 - Mach number
 - None of these
197. Failure warning circuit of True air speed mechanism of Mach/air speed indicator monitors
- MAN-flag
 - Mach-flag
 - Yellow-off flag *
 - None of these
198. In mach/air speed indicator, the indication of true air speed (TAS) is provided by
- Mass air speed pointer
 - Speed reference marker
 - Digital counter *
 - V_{mo} flag
199. Pneumatic / servo operated altimeter consists of
- One capsule
 - Two capsules *
 - Three capsules
 - No capsule
200. The pointer and counter of Pneumatic / servo driven altimeter are also driven by signals to
- CT synchro *
 - Amplifier
 - Resolver
 - None of these
201. Pneumatic section of pneumatic / servo driven altimeter performs as
- Main role
 - parallel role
 - Stand by role *
 - None of these
202. Signals supplied to CT synchro of Pneumatic / servo driven altimeter are of

- a. Low resolution b. High resolution * c. 1:72 d. 1:50
c. Both a. and b. d. None of these
203. A control knob provided in front of pneumatic /servo operated altimeter ils for selecting
a. CADC b. STBY
c. Both a. and b.* d. None of these
204. When the control knob of pneumatic / servo altimeter is moved from 'CADC' position to 'STBY', it
a. Connects CT b. Isolates CT *
c. Connects TDX d. None of these
205. When the control knob of pneumatic / servo operated altimeter is moved from 'CADC' position to 'STBY', it activates a
a. Red 'STBY' flag *
b. Yellow 'STBY' flag
c. Black 'STBY' flag
d. Black-yellow zebra flag
206. The 'STBY' flag of pneumatic / servo altimeter is
a. Electrically operated *
b. Mechanically operated
c. Pneumatically operated
d. None of these
207. For pressure setting of pneumatic / servo operated altimeter, the setting knob mechanism also positions
a. TX synchro rotor b. CT synchro stator *
c. TDX synchro stator d. None of these
208. For pressure setting of pneumatic / servo operated altimeter, the setting knob mechanism modifies the signals from
a. ADC TAS module
b. ADC altitude module *
c. ADC mach module
d. Both a. and b.
209. Barometric pressure setting knob of Pneumatic /servo operated altimeter also causes the equivalent pressure altitude signals to
a. Altitude selection facility of AFCS
b. Pitch control computer of AFCS
c. Both a. and b.*
d. None of these
210. In servo operated altimeter, the altitude signals designated as coarse and fine transmitted from ADC to
a. Stator of resolver synchro *
b. Rotor of resolver synchro
c. Stator of control synchro
d. Rotor of control synchro
211. The rotors of corresponding resolver synchro receiving the coarse and time altitude signals in servo operated altimeter are mechanically inter connected to gear train by a ratio of
a. 1:25 b. 1:27 *
212. The sine windings of corresponding resolver synchros receiving the coarse and fine altitude signals in servo operated altimeter are connected to
a. A amplifier b. A solid state switch *
c. A mechanical cam d. None of these
213. Sine windings of corresponding resolver synchros receiving the coarse and fine altitude signals in servo operated altimeter are connected to
a. Speed switch b. Solid state switch
c. Amplifier d. Both a. and b.*
214. The device used in servo operated altimeter, for operating the servo motor as per the amplifier signal of fine altitude below 1000' and coarse altitude above this, is
a. Cam device b. Speed switch *
c. Both a. and b. d. None of these
215. The purpose of speed switch in servo operated altimeter is to control the servo motor operation as per
a. fine altitude above 10,000 ft
b. Coarse altitude below 10,00 ft
c. fine altitude below 10,000ft *
d. None of these
216. The speed switch in servo operated altimeter, causes the servo motor to operate as per the signal
a. Course altitude below 10,000 ft
b. Time altitude above 10,000 ft
c. Course altitude above 10,000 ft *
d. Both a. and b.
217. In servo operated altimeter, the servo motor drives the altitude pointer and counter through a
a. Clutch b. Gear train
c. Both a. and b.* d. None of these
218. In servo operated altimeter, the servo motor directly drives a techo generator to provide
a. Coarse signal
b. Rate feed back signal *
c. Time signal
d. None of these
219. In servo operated altimeter, the rate feed back signal to the amplifier driving the servo motor is generated by
a. Cam shift b. Techo generator *
c. Resolver synchro d. TDX synchro
220. In servo operated altimeter, the reduction and 'nulling out' of altitude error signals is effected by driving
a. Resolver rotor * b. Servo-rotor
c. Speed switch d. Resolver stator
221. In servo operated altimeter, the cosine windings of the resolver are connected to a
a. Speed switch b. Logic circuit *

- c. Amplifier d. None of these
222. Cosine windings connected to logic circuit in servo operated altimeter monitors
- Coarse and fine servo 'nulls'
 - Coarse and fine excitation
 - Techogenerator
 - Both a. and b.*
223. In servo operated altimeter, the logic circuit monitors
- Indicator power supply
 - Valid altitude data
 - Techogenerator
 - Both a. and b.*
224. In servo operated altimeter, the logic circuit are connected with cosine windings, it monitors
- Techogenerator
 - Servo motor
 - Amplifier
 - Indicator power supply *
225. In servo operated altimeter, a solenoid operated 'OFF' warning flag is activated to
- Obscure the digital counter display
 - Data monitored by logic circuit are unreliable
 - Both a. and b.*
 - None of these
226. In servo operated altimeter, when indications monitored by cosine windings and logic circuits are unreliable
- OFF flag will obscure the digital counter *
 - 'UNRI' flag will come ON
 - Yellow-black zebra flag will come ON
 - Both a. and b.
227. In servo operated altimeter, the pressure setting knob rotates the
- Rotor of one torque synchro
 - Stator of one torque synchro
 - Stator of two resolver synchros *
 - Rotor of two resolver synchro
228. In servo operated altimeter, to compensate automatically for the relationship between barometric pressure and altitude during operation of setting device employed is
- Logic circuit
 - Non-linear mechanism *
 - Speed switch
 - Both a. and b.
229. Purpose of employing non-linear mechanism in servo operated altimeter is to compensate automatically for non-linear relationship between
- Speed switch and logic circuit
 - Barometric pressure and altitude *
 - Resolver synchro and logic circuit
 - None of these
230. The pressure setting knob of servo operated altimeter also rotates a third resolver for the purpose of
- AFCS
 - Altitude alerting
 - Both a. and b.*
 - None of these
231. In servo operated altimeter, a knob at bottom right hand corner permits
- Barometric pressure setting
 - Aligning of reference marker *
 - Testing of OFF flags
 - Both a. and b.
232. In servo operated altimeter, to align the reference marks with an altitude of specific operating condition, the device employed is
- Mechanical cursor on the dial
 - A knob at left side bottom of altimeter
 - A knob at right side bottom of altimeter *
 - None of these
233. In servo operated altimeter, the purpose of 'NEG' flag is to
- Show that altitude is below sea level
 - Obscure the digital counter
 - Show that altitude is below 10,000 feet height
 - Both a. and b.*
234. In servo operated altimeter the device comes in operation, for readings below sea-level is
- 'NEG' flag *
 - 'OFF' flag
 - 'Zero' flag
 - None of these
235. In servo-operated altimeter, the 'NEG' flag operation is
- Servo driven
 - To obscure the counter display
 - Electrical driven
 - Both a. and b.*
236. Most basic method of obtaining an indication of static air temperature is to use
- Charts
 - Sensing probe
 - Differential amplifier
 - Both a. and b.*
237. Conversion charts for calculation of static air temperature are provided by
- Calibration lab
 - Overhauling authority
 - Manufacturer *
 - None of these
238. In case of analog ADC, the conversion and correction of Static air temperature is effected by a circuit network incorporated is
- Altitude module
 - TAS module
 - TAT module
 - Mach module *
239. In static air temperature indicator, the indication is of
- LCD display
 - Drum type counter *
 - Analog pointer
 - None of these
240. In static air temperature indicator, the display of

- temperature by digital drum type counter in plus and minus parts are
- Left hand section
 - Right hand section
 - Both a. and b.*
 - None of these
241. In static air temperature indicator, the display of temperature by digital drum type counter in plus parts, are shown by
- Left hand section
 - Right hand section
 - Both a. and b.*
 - None of these
242. In SAT indicator , the display of temperature by digital drum type counter in minus parts are shown by
- Left hand section
 - Right hand section *
 - Both a. and b.
 - None of these
243. In SAT indicator , the display of temperature by digital drum type counter, the sign of temperature being indicated by
- Left hand section
 - Right hand section
 - Both a. and b.
 - None of these *
244. In SAT indicator , the centre drum displays the
- Sign of temperature *
 - Plus parts of temperature
 - Minus parts of temperature
 - None of these
245. In SAT indicator, the drums not in used are
- Covered by yellow flag
 - Automatically marked *
 - Covered by red flag
 - None of these
246. In SAT indicator, the computed SAT is supplied , as a DC analog voltage to a
- Logic circuit
 - Amplifier circuit
 - Chopper circuit *
 - Both a. and b.
247. In SAT indicator, the computed SAT supplied to chopper circuit is
- A DC analog voltage
 - An AC analog voltage *
 - A digital code pattern
 - None of these
248. In SAT indicator , the chopper circuit produces ac. error signal of
- 50Hz
 - 100Hz
 - 200Hz
 - 400 Hz *
249. In SAT indicator , the 400 Hz ac.error signal is produced by
- Speed switch
 - Chopper circuit *
 - Logic circuit
 - None of these
250. In SAT indicator , in the event of loss of DC or AC power or an excessive 'null' voltage in the rebalance/ feed back system,
- OFF flag is triggered
 - Counter display is obscure
 - Both a. and b.*
 - None of these
251. In SAT indicator , the off flag triggering causes the counter display to obscure when the
- Excessive 'null' voltage in the re-balance/feedback system
 - Loss of AC/DC power
 - Both a. and b.*
 - None of these
252. In digital ADC, the pitot/static pressure sensors are of
- E & I pick off type
 - Piezo electric crystal type *
 - Variable resistance type
 - None of these
253. In digital ADC, the type of signals supplied to the altitude, computed air speed and mach calculation circuit modules are
- Frequency modulated *
 - Amplitude modulated
 - Un- modulated
 - None of these
254. In digital ADC, the type of signals supplied to the altitude, computed air speed and mach calculation circuit modules via
- Digital to frequency converter
 - Frequency to digital *
 - Synchro to digital converter
 - None of these
255. In digital ADC , the analog inputs from the synchros of angle of attack (alfa. sensor and altimeter barometric pressure setting controls are converted by
- Frequency to digital converter
 - Synchro to digital converter *
 - Digital to synchro converter
 - None of these
256. In digital ADC, synchro-to-digital converter is used to convert the analog signal of
- Altimeter barometric pressure setting controls
 - Angle of attack sensors
 - Both a. and b.*
 - None of these
257. In digital ADC, frequency to digital converter is used for the signals of
- Altitude module
 - CAS module
 - Angle of attack sensor
 - Both a. and b.*
258. In digital ADC, outputs of all modulels are supplied to
- Individual user directly
 - ARINC-429 transmitter *

- c. Frequency -to-digital converter
d. None of these
259. In digital ADC, ARINC 429 transmitter is connected to
a. 2-data buses b. 3-data buses
c. 4-data buses * d. None of these
260. In digital ADC , all interfacing systems requiring air data are supplied by
a. ARINC-429 Transmitter *
b. Frequency to digital converter
c. Synchro to digital converter
d. None of these
261. In digital ADC, the purpose of discrete coder module is to monitor signals relating to the
a. Status of particular circuit
b. Integrity of particular circuit
c. Both a. and b.*
d. None of these
262. In digital ADC, the device employed to monitor the signals relating to the status and integrating of a particular circuit is
a. Power supply module
b. Discrete coder module *
c. SSEC
d. None of these
263. In digital ADC , type of module used to initiate the appropriate warnings of the heater circuits of pitot-probe, TAT-probe, and I-sensor is
a. Discrete coder module *
b. Altitude module
c. TAS-module
d. Mach-module
264. In digital ADC, programming of SSEC and angle of attack module with the relevant data is done in order to account automatically the
a. Pressure error of a air data system
b. Pressure error of a particular A/C
c. Pressure error of a particular indicator
d. Both a. and b.*
265. Indicators associated with digital ADC are of type
a. Pneumatic/servo operated
b. Pure servo operated *
c. Pure pneumatic
d. None of these
266. In digital servo operated altimeter, data may be supplied from either of
a. One ADC b. Two ADCs *
c. Three ADCs d. None of these
267. In digital servo operated altimeter, data from either of two ADCs are selected by
a. Magnetic relay b. Solid state switch *
c. Logic circuit d. None of these
268. In digital servo operated altimeter, under changing altitude conditions, signals for operating servo motor are given by
a. Decoder b. Multiplexer
c. Micro-processor * d. Comparator
269. In digital servo operated altimeter, under changing altitude conditions, signals for operating servo motor are given by
a. Analog to digital converter
b. Digital to analog converter *
c. Decoder
d. Microprocessor
270. In digital servo operated altimeter, under changing altitude condition servo motor does not drive the following
a. Counter mechanism b. Altitude pointer
c. Two Cx-synchros d. None of these *
271. In digital servo operated altimeters, under changing altitude condition servo-motor drives two synchros which supply following signals to the inputs multiplexer
a. Coarse analog input b. fine analog input
c. Digital signals d. Both a. and b.*
272. In digital servo operated altimeter, type of synchros positioned for the setting of barometric pressure are
a. Two control synchros
b. Two resolver synchro *
c. One control synchro
d. One resolver synchro
273. In digital servo operated altimeter, the type of signals, produced by resolver synchros, while setting the barometric pressure is
a. Sine related signal
b. Cosine related signal
c. Tan related signal
d. Both a. and b.*
274. In digital servo operated altimeter, the sine-cosine signals produced by resolver synchros while setting the barometric pressure manually , are fed to
a. Digital to synchro convertor
b. Synchro to digital convertor *
c. Frequency to digital converter
d. None of these
275. In digital servo operated altimeter, if input signal failure or a negative altitude condition should occur, the micro processor activates
a. Decoder b. Flag driver circuit
c. Logic circuit d. Both a. and b.*
276. In digital servo operated altimeter, if input signal fails or negative altitude condition occurs the device that activates the decoder and flag driver circuits is
a. Micro-processor * b. Input multiplexer
c. Output driver d. None of these

CHAPTER-28

MAGNETIC HEADING REFERENCE SYSTEM

1. MHRS stands for
 - a. Magnetic heading remote system
 - b. Magnetic heading reference system *
 - c. Magnetic heading referral system
 - d. None of these
2. MHRS is also known as a
 - a. Direct reading compass
 - b. Stand by compass
 - c. Remote indicating compass *
 - d. None of these
3. Remote indicating compass is also known as a
 - a. MHRS *
 - b. CADC
 - c. TACAN
 - d. None of these
4. Magnetic heading reference system uses following type of element to detect aircraft's heading w.r.t. horizontal component of earth's field,
 - a. Resistive
 - b. Capacitive
 - c. Inductive *
 - d. None of these
5. Detective element of remote indicating compass detects the following component of earth's magnetic field
 - a. Vertical
 - b. Horizontal *
 - c. Both a. and b.
 - d. None of these
6. Detective element of remote indicating compass detects earth's magnetic field in terms of
 - a. Flux
 - b. Induced voltage change
 - c. Angle of Flux
 - d. Both a. and b.*
7. In concept an MHRS is the combination of the function of a Direct reading magnetic compass and
 - a. Stand by compass
 - b. Direction indicator *
 - c. Both a. and b.
 - d. None of these
8. In practice, MHRS are of
 - a. One type
 - b. Two types *
 - c. Four types
 - d. None of these
9. Detector element of one type of MHRS monitors directional gyro unit linked with a
 - a. Stand by compass
 - b. Heading indicator *
 - c. Both a. and b.
 - d. None of these
10. Detector element of one type of MHRS operates in conjunction with the
 - a. MS-platform
 - b. Heading indicator
 - c. Both a. and b.*
 - d. None of these
11. Detector elements of MHRS takes the form of
 - a. 2-spoked wheel
 - b. 3-spoked wheel *
 - c. 4-spoked wheel
 - d. None of these
12. In the detector element of the MHR system, three spoked wheel, slit through the rim between the spokes so that they, and their section of rim, acts as
 - a. One individual flux collector
 - b. Two individual flux collector
 - c. Three individual flux collector *
 - d. None of these
13. In the detector element of MHRS, the exciter coil corresponds to transformer's
 - a. Secondary winding
 - b. Primary winding *
 - c. Common winding
 - d. None of these
14. In the detector element of MHRS, the coils wound around the spokes corresponds to transformer's
 - a. Primary winding
 - b. Secondary winding *
 - c. Common winding
 - d. None of these
15. In the detector element of MHRS, the magnetic flux passing through the single turn coil is a maximum when it is
 - a. Aligned with direction of earth's field *
 - b. Perpendicular with direction of earth's field
 - c. At 45°, w.r.t. the direction of earth's field
 - d. None of these
16. When the single turn coil of detecting element of MHRS is at right angle to the earth's field, the magnetic flux passing through it is
 - a. Maximum
 - b. Zero *
 - c. Maximum in opposite sense
 - d. None of these
17. The magnetic flux, passing through the coil, of a detecting element of MHRS is maximum but of opposite sense, when the coil is turned from its maximum value by
 - a. 0°
 - b. 90°
 - c. 180°*
 - d. None of these
18. When a coil is placed at an angle θ to a field of strength H ; the field can be resolved into
 - a. $H \sin \theta$
 - b. $H \cos \theta$
 - c. Both a. and b.*
 - d. None of these
19. When a coil is placed at an angle θ to a field of strength H , the component that produces no effective flux through the coil is

- a. $H \sin \theta$ * b. $H \cos \theta$
 b. Both a. and b. d. None of these
20. The material used for spokes of the detecting element of remote indicating compass is
 a. High carbon steel b. Permalloy *
 c. High silicon steel d. None of these
21. In detecting element of remote indicating compass, the transition from primary coil flux to flux in the legs is governed by
 a. Electrical characteristics of material
 b. Magnetic characteristics of material *
 c. Electrical characteristics of the coils
 d. None of these
22. Ratio of magnetic flux density (B) to field strength or magnetizing force (H) is known as
 a. Permeability * b. Saturation point
 c. Coercivity d. None of these
23. Permeability is the ratio of
 a. H/B b. B/H *
 c. $(B.H)/A$ d. None of these
24. Steepness of the B/H curve of permalloy in comparison to the B/H curve of the iron shows, its
 a. Low permeability
 b. High permeability *
 c. Low saturation point
 d. High saturation point
25. A point at which the magnetization curve starts levelling off is known as
 a. Permeability point b. Flattening point
 c. Saturation point * d. None of these
26. Higher saturation point in B/H curve of permalloy while comparing with that of iron, shows that it is
 a. More susceptible to magnetic induction *
 b. Less susceptible to magnetic induction
 c. Low permeable
 d. None of these
27. Lagging behind of the induced magnetism when after reaching saturation, the magnetizing force is reduced to zero from both the positive and negative direction is determined by
 a. Saturation point
 b. Co-ercivity
 c. Hysteresis curve and loop *
 d. None of these
28. Hysteresis curve and loop determines the ability of material to retain
 a. Voltage b. Magnetism *
 c. Capacitance d. None of these
29. In Hysteresis curve and loop, the magnetism remaining is known as
 a. Remanent flux density
- b. Remanence
 c. Both a. and b.*
 d. None of these
30. Material suitable for use in detector elements of remote indicating compass should possess
 a. Low remanence *
 b. High remanence
 c. Remanence does not effect
 d. None of these
31. Term refers to the amount of negative magnetizing force necessary to completely demagnetize a material is
 a. Permeability b. Saturation point
 c. Co-ercivity * d. None of these
32. Negative magnetizing force necessary to completely demagnetize a material is also known as
 a. Magnetizing force b. Coercive force *
 c. Both a. and b. d. None of these
33. Power of retaining magnetism of a material is determined by
 a. Remanence b. Co-ercivity *
 c. Both a. and b. d. None of these
34. Detector element of remote reading compass is also known as
 a. Flux compass b. Flux value *
 c. Stand by compass d. Both a. and b.
35. Magnitude of the induced voltage in the secondary windings of the detector element of the remote reading compass is the measure of the
 a. Speed of aircraft b. Heading of aircraft *
 c. Altitude of aircraft d. Both a. and b.
36. In the detecting element of the remote reading compass, for every complete cycle of the primary coil, no of complete cycles induced in secondary pick off will is
 a. One b. Two *
 c. Three d. Four
37. For every two complete cycles induced in the secondary, pick off coil of a detecting element of a remote reading compass, the number of cycle in primary required is
 a. One * b. Two
 c. Three d. Four
38. The AC supply for primary excitation coil of detecting element of remote reading compass has a frequency of
 a. 50 Hz b. 100 Hz
 c. 200 Hz d. 400 Hz *
39. The AC supply for primary excitation has a frequency of 400 Hz, resultant emf induced in the secondary pick off coil of detecting element of remote reading compass has a frequency of

- a. 200Hz b. 400Hz d. Both a. and b.*
c. 800 Hz* d. 50 Hz
40. Detecting element of remote reading compass, having tripple spoke and coil, has arrangement of a spacing of
a. 130° b. 90°
c. 120°* d. 180°
41. The type of mounting of spokes and coil assemblies of detecting element of remote reading compass is
a. Pendulously suspended
b. Universal joint
c. Both a. and b.*
d. None of these
42. Spokes and coil assemblies of detecting element of remote reading compass are pendulously suspended from a universal joint, gives freedom in
a. Pitch b. Roll
c. yaw d. Both a. and b.*
43. Limited amount of freedom in pitch & roll is given to the spokes and coil assemblies of the remote reading compass to sense
a. Minimum H b. Maximum H*
c. Minimum B d. Maximum B
44. Freedom of rotation of detecting element of remote reading compass in azimuth is
a. 360° b. 85°
c. No freedom* d. None of these
45. The case of the flux value is
a. Hermetically sealed
b. Partially filled with fluid
c. Both a. and b.*
d. None of these
46. The damp out excessive oscillations of the assemblies, the flux value is provided with
a. Eddy current damper
b. Two pairs of springs
c. Partially filled fluid*
d. None of these
47. Flux valve is partially filled with fluid to
a. Increase sensitivity
b. Avoid hitting the surface
c. Damp out oscillations*
d. Both a. and b.
48. Flux value can be mounted on a aircraft at a place
a. Convenient to pilot
b. Convenient for maintenance
c. Having least deviating effect*
d. None of these
49. Typical locations for the mounting of the flux value is
a. Wing tip
b. Vertical stabilizer
c. Centre of cockpit bottom
50. On a aircraft flux valves are mounted on flange with graduation for
a. No graduation b. Co-efficient A*
c. Co-efficient-B d. None of these
51. Deviation co-efficient - 'A' of an aircraft having MHRS is adjusted in
a. Indicator
b. Amplifier
c. Flux value mounting flange*
d. None of these
52. Monitored gyroscope system type of MHRS is comprised of
a. Deviation compensator
b. Detector element
c. Both a. and b.*
d. None of these
53. Monitored gyroscope system type of MHRS is comprised of
a. Slaving / Servo amplifier
b. Radio magnetic indicator
c. Both a. and b.*
d. None of these
54. In monitored gyroscope system of remote indicating compass, the secondary pick off coils of detecting element are connected to the corresponding
a. Rotor windings of CT receiver synchro
b. Stator windings of CT receiver synchro*
c. Stator windings of CDX transmitter synchro
d. None of these
55. In monitored gyroscope system of remote indicating compass, the error signal of magnetic heading is produced by
a. Slaving amplifier
b. Servo amplifier
c. Control synchro & flux value*
d. Both a. and b.
56. In monitored gyroscope system of remote indicating compass, the heading error voltage signal is first supplied to the
a. Deviation compensator
b. Radio magnetic indicator
c. Power supply module
d. Slaving module of amplifier*
57. In monitored gyroscope system of remote indicating compass, the phase of error signal is detected by
a. Servo module of amplifier
b. Deviation compensator
c. Directional gyro
d. Slaving module of amplifier*
58. In monitored gyroscope system of remote indicating compass, precession of gyroscope to new magnetic

- heading reference is achieved by
- Slaving module
 - Servo module
 - Both a. and b.*
 - None of these
59. In monitored gyroscope system of remote indicating compass, the servo control synchro system is operated by
- Directional gyro unit *
 - Radio magnetic indicator
 - Both a. and b.
 - None of these
60. In monitored gyroscope system of remote indicating compass, the servo control synchro system is operated by
- Detecting element
 - Servo control synchro system *
 - Deviation compensator
 - Power module
61. In monitored gyroscope system of remote indicating compass, the 'nulling' out the heading error signal is performed by
- 'null out' the heading error signal
 - Rotate the compass card of RMI
 - Both a. and b.*
 - None of these
62. In monitored gyroscope system of remote indicating compass, the compass card of RMI is rotated by
- Servo control synchro system
 - Slaving synchro rotor
 - Both a. and b.*
 - None of these
63. In monitored gyroscope system of remote indicating compass, the servomotor also drives a techo generator for the purpose of
- Damp out the oscillations
 - Feed back signal to amplifier
 - Inducing error signal
 - Both a. and b.*
64. In monitored gyroscope system of remote indicating compass, the device employed to dampout any oscillations of the servo system is
- Control synchros
 - Techogenerator *
 - Directional gyroscopic unit
 - None of these
65. The directional gyroscope unit of monitored gyroscope system of remote indicating compass is based on
- Two phase induction motor *
 - Three phase induction motor
 - Synchronous motor
 - DC motor
66. Location of DGU of monitored gyroscope system of remote indicating compass is
- Electronics equipment compartment
 - Remote point in A/C
 - Inside the RMI
 - Both a. and b.*
67. DGU of monitored gyroscope system of remote indicating compass, serves as a centralized source of heading data for use in the operation of
- Flight director
 - AFCS
 - Both a. and b.*
 - None of these
68. In monitored gyroscope system of remote indicating compass centralized source of heading data for the operation of AFCS and flight director are served by
- RMI
 - DGU *
 - Flux value
 - Deviation corrector
69. In monitored gyroscope system of remote indicating compass an additional Cx synchro in RMI is for the purpose of the heading data to
- HSI of flight director *
 - Stand by compass
 - Deviation corrector
 - None of these
70. In aircrafts employing monitored gyroscope system as a remote indicating compass, the magnetic heading signals to HSI of flight director are supplied by
- DGU
 - RMI *
 - Heading synchro
 - None of these
71. Directional gyroscope unit of monitored gyroscope system has the spin axis
- Horizontal *
 - Vertical
 - Can be both
 - None of these
72. Spin axis of directional all gyroscope limit of monitored gyroscope system is maintained in the horizontal position by
- Liquid level switch
 - Torque motor system
 - Servo motor system
 - Both a. and b.*
73. 'Spin down braking' in directional gyroscope limit of monitored. gyroscope system refers to
- Leveling switch operating system
 - Speed monitoring circuit system *
 - Flags operating system
 - None of these
74. Speed monitoring circuit system is incorporated in DGU of monitored Gyroscope system to prevent
- Oscillating effect *
 - Apparent drift
 - Fluctuation in speed
 - None of these
75. Oscillating effect of the gyroscope of DGU of monitored gyroscope system is also known as
- Slaving
 - Nutation *
 - Commutation
 - Modulation

76. Oscillating effect or nutation of the gyroscope of DGU, in monitored gyroscope system
- At low speed gyro *
 - At high speed of gyro
 - During precession
 - During acceleration of A/C
77. At low rotational speed of the gyroscope of monitored gyroscope system, its gimble ring axis are
- Perpendicular to each other
 - Not perpendicular to each other *
 - Topples
 - None of these
78. Speed monitoring circuit system of monitored gyroscope system
- Holds the speed constant
 - Supply extra voltage for increasing speed
 - Holds the gimble system steady *
 - None of these
79. Circuits for monitoring warning flags in RMI and HSI of flight director system are provided
- In DGU *
 - In detecting element
 - In heading servo synchro
 - None of these
80. Complete gyroscope assembly (DGU) monitored gyroscope system is mounted on
- Universal joint
 - Pendulously suspended
 - Anti vibration mounting *
 - Both a. and b.
81. Radio magnetic indicator indicates
- Magnetic heading data
 - Magnetic bearing of A/C
 - Both a. and b.*
 - None of these
82. Magnetic bearing of an aircraft indicated by the RMI is with reference to
- True north
 - Magnetic north
 - Ground based radio transmitter *
 - Both a. and b.
83. Systems concerned for the indication of RMI are
- ADF
 - VOR
 - Both a. and b.*
 - None of these
84. ADF in radio magnetic indicator stands for
- Auto director flight
 - Automatic direction finding *
 - Altitude & direction finder
 - None of these
85. VOR in radio magnetic indicator stands for
- Voltage operating relay
 - Vary omni range
86. Magnetic heading data in RMI is displayed by
- Fixed lubber line
 - Heading card
 - Double bar pointer
 - Both a. and b.*
87. In RMI for taking heading data heading card is read against the
- Double bar pointer
 - Fixed lubber line *
 - single bar pointer
 - Both a. and b.
88. In RMI, magnetic bearing indications are provided by
- Double bar pointer
 - Single bar pointer
 - Lubber line & heading card
 - Both a. and b.*
89. In RMI, reading of both the pointers are taken against
- Heading card *
 - Lubber line
 - Each other
 - None of these
90. In RMI, both the pointers are positioned by synchros, with the appropriate bearing signals from the navigational receiver
- ADF
 - VOR
 - Both a. and b.*
 - None of these
91. Normally, how many types of ADF and VOR systems are installed in an aircraft
- One
 - Two *
 - Three
 - None of these
92. In RMI, ADF / VOR systems are installed in an aircraft
- Selector knob in main instrument panel
 - Selector knob in the face of instrument *
 - Automatically shows always
 - None of these integrated system
93. In the signal transmission of MHR/INS integrated system error signals are supplied to a
- Logic circuit
 - Stepped motor
 - Slaving amplifier
 - Both a. and b.*
94. In the signal transmission of MHRS/INS integrated system the heading error signals are supplied to stepper motor via logic circuit control module, which it performs the functions of
- Frequency comparison
 - Voltage/frequency conversion
 - Both a. and b.*
 - None of these
95. In the MHRS/INS integrated system, the function of frequency comparison and voltage/frequency conversion is performed by
- Stepper motor

- b. Detecting element
c. Deviation compensator
d. Logic circuit control module *
96. In the MHRS/INS integrated system, the direction of stepper motor rotation is determined by
a. Resolver synchro
b. Phase modules
c. Polarity detector circuit *
d. Both a. and b.
97. In the MHRS/INS integrated system the stepper motor is mechanically coupled to the CDX synchro rotor, whose shaft rotates
a. A step at a time * b. Two step at a time
c. Continuous rotation d. None of these
98. In the MHRS / INS integrated system each step of rotating of the stepper motor, corresponds to an arc of
a. 1 degree b. 1.3 min *
c. 5 min d. None of these
99. In the MHRS/INS integrated system, heading error signals are produced as a result of
a. Selection of new magnetic heading to be flown
b. Drift of DGU or inertial platform
c. Both a. and b.*
d. None of these
100. In the MHRS/INS integrated system, rate of synchronization of the slaving circuit system
a. Depends upon magnitude of heading error *
b. 1-2°/min for heading error more than 2°
c. Remains constant
d. None of these
101. In MHRS/INS integrated system, rate of synchronization for the heading error of less than 2° will be
a. 1°-2°/min * b. 3°-5°/min
c. 5°/min d. None of these
102. In MHRS/INS integrated system, role of synchronization for the heading error of more than 2° will be
a. Remains constant b. Fast rate *
c. Slow rate d. Both a. and b.
103. In MHRS/INS integrated system slow, rate of synchronization is
a. 1°-2°* b. 3°-5°
c. 5°/min d. None of these
104. In MHRS to achieve synchronization at fast rate, the device used is
a. Manual control b. Automatic control
c. Both a. and b.* d. None of these
105. A typical annunciator of MHRS integration with INS, consists of a
a. DC-micro voltmeter
b. DC-micro-ammeter *
c. DC-micro-ohm-meter
d. None of these
106. Synchronized state of a slaving system of a MHRS integration with INS is indicated by
a. Centre zero position
b. Annunciator
c. S-flag
d. Both a. and b.*
107. Centre zero position of annunciator in MHRS integration with INS shows that slaving system is
a. Not synchronized b. Fully synchronized *
c. Getting synchronized d. None of these
108. Depending upon type of MHRS, the annunciator may be incorporated within either of following
a. RMI b. Control panel
c. DGU d. Both a. and b.*
109. Deflection of annunciator pointer to one or other side of zero in MHRS, shows that, slaving system is
a. Fully synchronized
b. DC synchronised *
c. Getting synchronized
d. None of these
110. If the slaving system of MHRS is desynchronised, the annunciator pointer will be
a. Deflected one side of zero
b. Deflected to other side of zero
c. At centre zero
d. Both a. and b.*
111. During turning of A/C, the annunciator of MHRS pointer
a. Remains constant b. Deflects *
c. Is covered d. None of these
112. During flight the annunciator pointer hunts / oscillates due to
a. Vibration of RMI
b. Vibration of DGU
c. Pendulosity of flux valve *
d. Vibration of A/C
113. Pendulosity effect of detecting element causes the annunciator pointer in flight to
a. Remain steady b. Oscillates slowly *
c. Go to extreme left d. None of these
114. Oscillation of annunciator pointer of MHRS during flight, shows that, slaving
a. Is not taking place b. Is taking place *
c. Is not accurate d. Is at fast rate
115. Fast synchronizing rate of slaving system of MHRS is
a. 1-2°/min b. 5°/min
c. 300°/min * d. 180°/min

116. Synchronizing knob provided in RMI is for
 a. Manual slaving b. Fast slaving
 c. Slow slaving d. Both a. and b. *
117. An arrow on synchronizing knob provided in RMI is marked
 a. Zero b. Plus
 c. Both a. and b. * d. None of these
118. In the case of MHRS /INS integrated system, the slaving circuit has to be maintained in synchronism with heading reference of
 a. MHRS b. INS platform
 c. Both a. and b. * d. None of these
119. In the case of MHRS/INS integrated system, manual synchronizing knob is
 a. Provided b. Not provided *
 c. Depends upon A/C d. None of these
120. In the case of MHRS/INS integrated system, for higher heading error of more than 2° , stepper motor is driven at an rate of
 a. 50-100°/min b. 200-300°/min
 c. 600-800°/min * d. None of these
121. In MHRS/INS integrated system, when power is initially applied, the synchronizing rate of the system is
 a. Slow b. Fast *
 c. Initially slow then fast d. None of these
122. MHR system provides the following selection mode of operation
 a. Slaved b. DG
 c. Both a. and b. * d. None of these
123. Magnetic intensity of earth's field component 'H' varies with
 a. Height of A/C
 b. Latitude *
 c. Longitude
 d. Remains same in all conditions
124. Accuracy of the MHR system, when selected in slaving mode
 a. Varies with longitude
 b. Varies with latitude *
 c. Varies with altitude
 d. Remains same in all conditions
125. For the flight of aircraft beyond 70° north or south of equator, the preferred mode of operation of MHR system will be
 a. Slaving * b. D.G.
 c. Stand by compass d. None of these
126. Accuracy of the slaving mode will be effected during aircraft flight over
 a. Equator
 b. Less then 70° N/S of equator
 c. Beyond 70° N/S of equator *
127. In the DG mode of operation in MHR system, heading information displayed is
 a. Updated once b. Frequently updated *
 c. Updation not required d. None of these
128. In a basic monitored gyroscope type, the RMI is provided with a 'SET-HDG' knob for
 a. Selecting a slave
 b. Selecting a DG-mode
 c. Selecting a desired heading *
 d. Both a. and b.
129. 'SET-HDG' knob in RMI moves
 a. Heading pointer b. Compass card
 c. Heading bug * d. None of these
130. In MHRS/INS system, for selecting a desired sheading,mechanism provided is
 a. A 'Set-hdg' in RMI
 b. A 'Set-hdg' knob in control panel
 c. A 'Set-hdg' switch in control panel *
 d. Both a. and b.
131. The 'SET-HDG' switch on system control panel of MHRS/INS is supplied with
 a. Direct current * b. AC current
 c. Pulsating DC d. Both a. and b.
132. The 'SET-HDG' switch on system control panel of MHRS/INS has one centre position and
 a. 2-left & 2-right * b. 1-left & 1-right
 c. 2-left & 1-right d. None of these
133. On selecting 'left-1' on 'SET-HDG' switch on system control. panel of MHRS/INS, the rate of rotation of stepper motor will be
 a. 100-200°/min b. 200-400°/min *
 c. 800-1200°/min d. None of these
134. On selecting 'left-1 or 2' on SET-HDG' switch on system control panel of MHRs/INS, the direction of rotation of stepper motor will be
 a. Anti-clockwise b. Counter clockwise
 c. Clockwise d. Both a. and b. *
135. On selecting 'Right-2' on 'SET-HDG' switch on system control. Panel of MHRS/INS, the rate and direction of stepper motor will be
 a. 200-400°/min b. 200-400°/min
 c. 800-1200°/min * d. 800-1200°/min
136. The 'SET-HDG' switch on control panel of MHR/INS is of
 a. Limited travel type b. Spring loaded type
 c. Toggle type d. Both a. and b. *
137. Deviation in heading indication is an
 a. Accuracy b. Error *
 c. Slaving rate d. None of these

138. An error in heading indication that results from hard and soft iron components of aircraft magnetism on detector element of a compass is termed
- Compass error
 - Heading error
 - Deviation *
 - Drift
139. Normally deviation method adopted for compensation of co. efficiencies B and C are,
- Electro magnetic *
 - Flux value mounting
 - Knob selector
 - None of these
140. Remotely located compensator unit in MHRS is used for correction of co-efficient
- C
 - B
 - D
 - Both a. and b. *
141. While adjusting co- efficiencies B & C in compensator unit of MHRS; it produces in the flux value an small
- DC signal in pick off coil *
 - AC signal in excitor will
 - DC signal in excitor will
 - None of these
142. Aircrafts employing dual MHRS/INS, the transfer relay are controlled by a selector switch mounted on
- RMI
 - Control panel *
 - Compensator unit
 - DGU
143. In normal position of selector switch, aircrafts employing dual MHRS/IN-system, operates as
- Inteconnected with each other
 - Independent of each other *
 - In synchronizm with stand by compass
 - None of these
144. In dual monitored gyroscope system, in the event of failure of magnetic heading data input to one or other system, the operating system can be selected by
- Transfer relay *
 - Coupler
 - Automatically
 - None of these
145. In the arrangement of typical MHR/IN system, a selector switches are placarded 'RADIO' and 'INS'. On its 'RADIO' selection, each HSI is supplied with
- True heading data
 - Magnetic heading data *
 - Hand by compass data
 - DGU data

CHAPTER - 29

FLIGHT DIRECTOR SYSTEMS

1. Flight director system displays
 - a. Pitch & Roll attitude
 - b. Heading
 - c. Altitude
 - d. Both a. and b.*
2. Along with pitch, roll, heading of an aircraft, the FDS also displays
 - a. Altitude
 - b. ADF/VOR *
 - c. Airspeed
 - d. Both a. and b.
3. FDS stands for
 - a. Flight directing system
 - b. Flight data system
 - c. Flight data store
 - d. Flight director system *
4. ILS stands for
 - a. Instrument landing system *
 - b. Integrated landing system
 - c. Inertial landing system
 - d. None of these
5. Which unit in FDS function for converting attitude reference and command signals supplied to it by computer into servo actuating power signals to drive indicators
 - a. Vertical gyroscope limit
 - b. Air data computer
 - c. Instrument amplifier *
 - d. MHR system
6. ADI in flight director system refers to
 - a. Altitude director indicator
 - b. Attitude director indicator *
 - c. Air data indicator
 - d. None of these
7. Vertical gyroscope unit (VGU) performs the function of
 - a. Gyro horizon *
 - b. Directional gyro
 - c. Vertical speed
 - d. None of these
8. Vertical gyroscope unit (VGU) establishes a stabilized reference about
 - a. Roll axis
 - b. Pitch axis
 - c. Yaw axis
 - d. Both a. and b.*
9. VGU supplies attitude related signals to computer known as
 - a. Air data computer
 - b. Flight data computer
 - c. Steering computer *
 - d. Both a. and b.
10. VGU supplies attitude related signal to
 - a. Amplifier unit
 - b. Steering computer
 - c. Air data computer
 - d. Both a. and b.*
11. Servo operated indicating element in FDS is incorporated in
 - a. Attitude director indicator *
 - b. AFCS
 - c. Air data computer
 - d. Both a. and b.
12. Solid - state circuit module boards or cards, necessary for the processing of attitude reference and command signals of FDS are contained in
 - a. VGU
 - b. Computer *
 - c. ADI
 - d. HSI
13. In computer of FDS; for the purpose of adjusting and scaling the gain values of signals, item provided is
 - a. Logic circuit boards *
 - b. Solid state circuit module board
 - c. Instrument amplifier
 - d. None of these
14. In addition to the roll and pitch attitude of the aircraft ADI also provides information of A/C position w.r.t
 - a. Glide slope (GS)
 - b. Localizer(LOC).
 - c. Both a. and b.*
 - d. None of these
15. Instrument landing system (ILS) transmits from ground
 - a. Glide slope (GS)
 - b. Localizer (LOC).
 - c. Both a. and b.*
 - d. None of these
16. A symbol representing the aircraft image in ADI of flight director system is
 - a. Fixed *
 - b. Moving
 - c. Adjustable
 - d. None of these
17. A tape is positioned and moves around two rollers in ADI of FDS to indicate
 - a. Roll attitude
 - b. Pitch attitude *
 - c. Yaw attitude
 - d. Both a. and b.
18. In ADI of flight director indicator tape around rollers to indicate pitch attitude of A/C, is moved by
 - a. Servo motor
 - b. Gear train
 - c. A shift
 - d. Both a. and b.*
19. In ADI of flight director system, the servo motor which drives the pitch attitude tape is activated by pitch CX synchro of
 - a. RMI
 - b. VGU*
 - c. Computer
 - d. Amplifier

20. ADI of flight director system the roll attitude is indicated by scale and a pointer fixed to
- Bezel glass
 - Ring gear *
 - Tape motor
 - Case
21. Direction of rotation of ring gear of attitude director indicator of FDS is determined by the phase relationship between error signal voltage and voltage of
- Instrument amplifier
 - VGU
 - Servo motor excitation *
 - Both a. and b.
22. In ADI of flight director system, whenever roll attitude pointer moves, the pitch attitude tape
- Does not move
 - Also rotates *
 - Fluctuates
 - None of these
23. In ADI of flight director system, whenever roll attitude pointer moves, the pitch attitude tape also rotates together by
- A shift
 - A differential gear *
 - A cam
 - None of these
24. In ADI of flight director system, glide slope indicating element is located at
- Left of attitude display *
 - Right of attitude display
 - Bank scale
 - Radio altitude
25. In ADI of flight director system, the type of display at the right side of attitude display is
- Glide slope
 - LOC
 - Bank scale
 - Radio altitude *
26. In ADI of flight director system, the type of display at the left of attitude display is
- Glide slope *
 - LOC
 - Bank scale
 - Radio altitude
27. In ADI of flight director system, the type of display at the bottom of altitude display is
- Glide slope
 - LOC *
 - Bank scale
 - Radio altitude
28. In ADI of flight director system, the element for the display of radio altitude is situated at the
- Left of attitude display
 - Right of attitude display *
 - Top of attitude display
 - Bottom of attitude display.
29. In ADI of flight director system, the elements of GS and LOC indication are deflected by
- Miniature type micro ammeter *
 - Miniature type micro-voltmeter
 - Miniature A/C
 - None of these
30. Glide slope and localizer indicating element of ADI in flight director system consist of a
- Scale
 - Pointer
 - Miniature A/C
 - Both a. and b.*
31. The dots on the glide slope scale of attitude director indicator of FDS, represent
- 75 m amp *
 - 150 mA
 - 75 m volts
 - 150 mv
32. 75 m amp of beam deflection, in glide slope indicating element of attitude director indicator of FDS, represents element of attitude director indicator of FDS, represents
- 0.35°*
 - 0.7°
 - 0.5°
 - None of these
33. From the centre position, localizer scale of ADI of flight director indicator, has
- Single dot to left & right *
 - Double dots to left and right
 - Total four dots
 - None of these
34. Each dot to the left and right of centre position of localizer pointer of attitude director indicator represents
- 25 m Amp
 - 50 m Amp
 - 75 m Amp *
 - None of these
35. Each dot of localizer scale of attitude director indicator equals to aircraft deviation of
- 0.5°
 - 1° *
 - 1.5
 - 2°
36. Localizer pointer of the attitude director indicator is distinctly shaped to represent
- Converged shape of runway *
 - Diverged shape of runway
 - Mirror image of runway
 - None of these
37. In some ADIs the localizer pointer is also deflected upwards by signals from
- Vertical gyro unit
 - Servo-altimeter *
 - Radio altimeter
 - Both a. and b.
38. In some ADIs, the localizer pointer is also deflected upward by radio altimeter signal to simulate the
- Miniature aircraft
 - Runway *
 - Circle
 - Both a. and b.
39. 'Rising runway' symbol is called, in attitude director indicator's localizer pointer when this symbol just touches
- At touch down
 - Fixe A/C symbol
 - At take off
 - Both a. and b.*
40. In attitude director indicator, the term 'Rising runway' relate to
- Localizer
 - Radio altimeter

- c. Both a. and b.* d. None of these
41. In attitude director indicator, the term 'Rising runway' relates to the
 a. Take off of A/C
 b. Touch down of A/C *
 c. Straight & level flight of A/C
 d. None of these
42. Red warning flag on Glide slope pointer & scale of ADI comes on when
 a. GS mode not selected
 b. Valid and reliable signal not received
 c. Both a. and b.*
 d. None of these
43. When glide slope pointer and scale of ADI does not come into view due to unreliable signal or not operating in GS mode, it is covered by
 a. Red warning flag *
 b. Yellow warning flag
 c. Black warning flag
 d. None of these
44. When localizer pointer and scale of ADI are not in operation it is covered by a
 a. Red warning flag b. Shutter *
 c. Zebra flag d. None of these
45. Red warning flag covers the scale and pointer of the following indicating element, when it is not in operation
 a. Localizer b. Glide slope *
 c. Both a. and b. d. None of these
46. Retractable shutter covers the scale and pointer of the following indicating element of ADI when invalid and unreliable signals are supplied in VOR/LOC mode
 a. Localizer * b. Glide slope
 c. Both a. and b. d. None of these
47. Gyro flag of attitude director indicator is controlled by
 a. DGU b. VGU*
 c. Instrument amplifier d. Both a. and b.
48. Warning flag that comes on in ADI, when power failure occurs in attitude reference circuit, is placarded
 a. Gyro * b. Computer
 c. VGU d. DGU
49. The warning flag placarded 'Computer' comes on in ADI when failure takes place in inputs to the computer itself and
 a. Instrument amplifier b. ADI
 c. VGU d. Both a. and b.*
50. In case of failure to the inputs of computer itself, instrument amplifier and ADI takes place in attitude director indicator, the warning flag comes on
 a. Gyro b. Computer *
 c. Power d. Both a. and b.
51. In case of failure of inputs to the computer itself, the instrument amplifier and the ADI of flight director system, warning flag provided is placarded as
 a. Gyro * b. Computer
 c. AMPLE d. Both a. and b.
52. In ADI of flight director system, command bars provide commands relating to manoeuvre an aircraft in
 a. Pitch attitude b. Roll attitude
 c. Yaw attitude d. Both a. and b.*
53. In ADI of flight director system, command bars driven by
 a. Tape roller b. Servo motor *
 c. Gear ring d. Cam shift
54. In ADI of flight director system, when the commands for roll and pitch attitude are coincided, the bars take up position with
 a. Top of fixed A/C symbol *
 b. Bottom of fixed A/C symbol
 c. Centre of fixed A/C symbol
 d. None of these
55. When command bars of attitude (Roll / Pitch) deflection of ADI takes a position, coinciding with top of fixed A/C symbol, it
 a. Satisfied * b. Fly high
 c. Fly low d. Fly left
56. When command bars of attitude (Roll/Pitch) deflection of ADI takes a position, bottom of fixed aircraft symbol, it indicates the commands
 a. Satisfied b. Fly high
 c. Fly low * d. Fly left
57. In attitude director indicator, servomotor also drives an tachogenerator to provide
 a. Initiate the motor
 b. Damping of motor *
 c. Increase the speed of motor
 d. None of these
58. An tachogenerator driver by servomotor in attitude director indicator produces an output signal which is fed to
 a. Computer b. Instrument amplifier *
 c. VGU d. DGU
59. If an aircraft is displayed simultaneously about pitch and roll, as a primary attitude reference operation of attitude director indicator, both the roll & pitch channels will move
 a. Glide slop pointer b. Localizer pointer
 c. Attitude tape * d. Both a. and b.
60. On setting the pitch up signal by manual knob of ADI, the fixed aircraft symbol goes
 a. Above the command bars
 b. Below the command bars *
 c. Left of the command bars

- d. Right of the command bars
61. On setting the command bars of ADI above the fixed aircraft symbol by manual command setting knob, the synchro gives a signal
- Pitch up
 - Pitch down *
 - roll left
 - roll right
62. In attitude director indicator, error signal for pitch is composed and amplified in
- Computer
 - Magnetic amplifier
 - Instrument amplifier *
 - ADI
63. Device used to present a pictorial plan view of an aircraft's situation in the horizontal plane in the form of heading, VOR/LOC and data relating to height to and from a VOR station is
- ADI
 - RMI
 - Heading indicator
 - HSI *
64. Horizontal situation indicator (HSI) represents aircraft's
- VOR/LOC
 - Heading
 - Both a. and b.*
 - None of these
65. Selector knob in horizontal situation indicator (HSI) for setting desired magnetic heading provided on
- Top left side
 - Top right side
 - Bottom left side *
 - Bottom right side
66. Selector knob provided on the bottom right side of the horizontal situation indicator is for setting the
- Heading
 - VOR/LOC course *
 - Both a. and b.
 - None of these
67. Selector knob provided on the bottom left side of HSI face is for setting of
- Heading *
 - VOR/LOC course
 - Both a. and b.
 - None of these
68. Horizontal situation indicator also displays
- Deviation from GS beam
 - Distance from DME station
 - Both a. and b.*
 - None of these
69. In horizontal situation indicator (HSI), the fixed aircraft symbol displays the position and heading of A/C in relation to
- Compass card
 - VOR/LOC deviation bar
 - Both a. and b.*
 - None of these
70. In horizontal situation indicator, the VOR / LOC deviation bar is also called
- Longitudinal deviation bar
 - Lateral deviation bar *
 - Lateral horizon bar
 - Longitudinal horizon bar.
71. In aircrafts equipped with inertial navigation system, the HSI also integrates with computer of the system, to get
- True heading
 - Magnetic heading
 - Both a. and b.*
 - None of these
72. Heading display section of horizontal situation indicator in simplified form consists of a compass card mounted on a
- Tape with rollers
 - Ring gear *
 - Gimble ring
 - Both a. and b.
73. In HSI, heading is indicated against fixed lubber line and
- The index mark
 - compass card *
 - Aircraft symbol
 - None of these
74. In HSI, in order to select a magnetic heading, the device provided is
- Aircraft symbol
 - Lubber line
 - Heading marker *
 - Command bars
75. In order to set a desired heading in horizontal situation indicator, heading marker is positioned against
- Aircraft symbol
 - Command bars
 - Lubber line
 - Compass card *
76. When change in heading takes place in HSI while selecting the heading by manual setting, device that permits relative movement between marker and card is
- Differential synchro
 - Differential gear *
 - Summing point
 - Control synchro
77. In the case of integration with INS, the aircraft heading signals from MHRS are supplied via
- Radio altimeter
 - RMI *
 - ADI
 - None of these
78. In the case of integration with INS, on a constant heading of aircraft, the error signal between Azimuth synchro in HSI and with that of MHRS will be
- Null *
 - Minimum
 - Maximum
 - None of these
79. During constant heading of aircraft having MHRS integrated with INS the indication of HSI & RMI will be
- At 180° to each other
 - At 90° to each other
 - Same *
 - None of these
80. When it is required to change an aircraft's heading, the flight director system is operated in
- MAN-GS mode
 - VOR-LOC mode
 - HDG-mode *
 - OFF mode
81. When it is required to change an aircraft's heading, the FDS is operated in HDG-mode to provide
- Roll command *
 - Pitch command
 - Both a. and b.
 - None of these
82. On selecting the heading in HSI by knob, the error signal produced by CT synchro is applied to the
- Roll channel of FDS computer *
 - Pitch channel of FDS computer *

- c. Both a. and b.
d. None of these
83. On selecting the heading in HSI by knob, the error signal produced, is fed from FDS computer to ADI is a
a. Roll command * b. Pitch command
c. Both a. and b. d. None of these
84. On selecting the heading in HSI by knob, type of display pattern in ADI will be effected is
a. Command bars * b. Attitude tape
c. LOC indicator d. GS pointer
85. The secondary section of an horizontal situation indicator display relates to an aircraft's lateral position with respect to
a. VOR station
b. Localizer beam of an ILS
c. Stand by computer
d. Both a. and b.*
86. Course display section of HSI consists of
a. Deviation bar b. Scale plate
c. Command bar d. Both a. and b.*
87. Each dot of scale plate of course display section in HSI, corresponds to
a. 1° deflection * b. 2° deflection
c. 3° deflection d. None of these
88. Deflection to left of deviation bar from the centre of scale mark in HSI commands
a. Fly left * b. Fly right
c. Pitch up d. None of these
89. Deviation bar of HSI is deflected by a
a. AC meter movement
b. DC meter movement *
c. Trains of gear
d. Both a. and b.
90. When there is no deviation signals, the deviation bar of HSI is aligned with
a. Lubber line b. Course marker *
c. Heading marker d. None of these
91. The deviation bar of HSI is deflected by DC meter with signals from
a. DGU
b. VGU
c. Radio navigation receiver *
d. RMI
92. In addition to the deflection, the bar, its scale and course marker in HSI, can be
a. Move up b. Move down
c. Rotated * d. Both a. and b.
93. In addition to the deflection, the pattern that can be rotated in bar
a. Its scale b. Course marker
- c. Both a. and b.* d. None of these
94. In horizontal situation indicator, the deflection bar, its scale and course marker can be rotated
a. Relative to compass card
b. Along with compass card
c. Both a. and b.*
d. None of these
95. In HSI, deflection bar, its scale and course marker rotates relative to compass card whenever selection is made to
a. VOR station
b. ILS localizer
c. A/C turns to selected course
d. Both a. and b.*
96. In HSI, deflection bar, its scale and course marker rotates relative to compass card whenever selection is made to
a. VOR station
b. ILS localizer
c. A/C turns to selected course *
d. Both a. and b.
97. In horizontal situation indicator, whenever selection is made to VOR station / ILS localizer, the pattern consisting deviation bar, scale, course marker rotates
a. Relative to compass card *
b. Along with compass card
c. Both a. and b.
d. None of these
98. In horizontal situation indicator, whenever aircraft turns on to a selected course, the pattern consisting deviation bar, scale, course maker rotates
a. Relative to compass card
b. Along with compass card *
c. Both a. and b.
d. None of these
99. In HSI, selection of desired VOR radial or localizer course is carried out by rotating the
a. Heading selector knob
b. Course selector knob *
c. Both a. and b.
d. None of these
100. In HSI, while rotating the course selector knob, the deviation bar, its scale and marker changes their position along with
a. Digital computer * b. Compass card
c. Both a. and b. d. None of these
101. In case of selecting a course in HSI to fly on to a desired VOR radial, the RS synchro rotor shifts the phase of reference modulating signal of frequency
a. 20Hz b. 30 Hz *
c. 50Hz d. 40Hz
102. Low frequency reference modulating signal from

- ground VOR station are received in aircraft by
- Radio magnetic indicator
 - Radio navigation receive *
 - MRHS
 - ADI
103. On selecting the course of an aircraft in HSI , the reference modulating & variable modulating signals of VOR are compared in
- Logic circuit
 - Computer
 - Phase comparator circuit *
 - None of these
104. The output of the phase comparator circuit in HSI , while selecting course on to a desired VOR is supplied to the
- Tape roller motor
 - Meter movement *
 - Ring gear motor
 - None of these
105. The output of the phase comparator circuit in HSI, while selecting course on to a desired VOR, deflects
- Command bars
 - Deviation bar *
 - Course marker
 - Heading marker
106. In horizontal situation indicator on selecting the course / heading; the course datum synchro CX and heading error synchro performs the
- Same function *
 - Different function
 - Remains by passed
 - None of these
107. In HSI , on selecting the course by knob, the course datum synchro produces a
- Roll command *
 - Pitch command
 - Both a. and b.
 - None of these
108. In HSI , on selecting the course by knob, the signal produced by the datum synchro is supplied to
- RMI
 - ADI *
 - Both a. and b.
 - None of these
109. In horizontal situation indicator , flight along the localizer beam is indicated by the alignment of the deviation bar with the
- Course arrow *
 - GS pointer
 - Lubber line
 - Heading marker
110. The effects of any cross-winds during the flight along the beam are automatically corrected by the compensating
- FDS computer *
 - Wash-out circuit
 - Both a. and b.
 - None of these
111. Crab- angle is also indicated in HSI, by the position of deviation bar relative to
- Localizer scale
 - Fixed lubber line *
 - GS-scale
 - Heading marker
112. 'Wash-out' circuit in FDS computer compensates the effect of any cross winds during the flight along the beam to establish necessary
- Approach angle
 - Crab angle *
 - Wash angle
 - None of these
113. When the VOR station frequency is tuned in, the dc-meter positioning the To-from indicator, is supplied with signals from a
- Phase comparator *
 - Deviation compensator
 - RMI
 - Both a. and b.
114. Indication of whether an aircraft is flying from or to a station is provided by an indicator having its head shaped
- Arrow *
 - Plus
 - 'N'
 - None of these
115. In HSI of FDS when the VOR station frequency is tuned in, the To-from indicating marker positions to the direction of course marker to indicate that the selected course is
- To the station selected
 - From the station selected
 - Both a. and b.*
 - None of these
116. In HSI of FDS, on tuning the VOR station frequency, if an aircraft is flying from this station, the meter movement of course marker deflects the arrow through
- 0°
 - 90°
 - 180°*
 - None of these
117. When FDS operates in LOC mode , the deflection of deviation bar in HSI results from
- Amplitude comparison of beam signals *
 - Frequency comparison beam signals
 - Amplitude comparison of GS signals
 - None of these
118. When FDS operates on LOC mode, the To-from arrow in HSI remains
- In view
 - Out of view *
 - Moving 360°
 - None of these
119. Red warning flags in HSI are provided to indicate the unreliability or completely failing of signals of glide slope and
- VOR
 - LOC *
 - Both a. and b.
 - None of these
120. In case of failure of unreliability of the signals of GS , VOR & LOC in HSI the warning device used to indicate is
- Yellow flag
 - Red flag *
 - Gyro flag
 - None of these
121. In HSI , in case of completely failure or unreliability of signals from the following , the warning flag will come on , for
- MHRS
 - VOR/LOC/GS
 - Both a. and b.*
 - None of these

122. DME in horizontal situation indicator (HSI) stands for
 a. Direct measuring equipment
 b. Dual measuring equipment
 c. Distance measuring equipment *
 d. None of these
123. (DME) Distance measuring equipment of HSI is positioned
 a. On ground
 b. In aircraft *
 c. Both a. and b.
 d. None of these
124. Distance measuring indicator , displays the distance in
 a. Kilometer
 b. Miles
 c. Nautical miles *
 d. None of these
125. In case the (DME) distance measuring equipment signal is not valid , the display of distance in HSI
 a. Will show OFF
 b. Will show 'INVA'
 c. Will be covered by an shutter *
 d. None of these
126. In case the DME is not valid in HSI , the display is covered by a shutter operated
 a. Mechanically
 b. Electrically *
 c. Remotely
 d. None of these
127. 'Decision height' is a term in horizontal situation indicator which denotes specified
 a. Maximum altitude of an A/C
 b. Minimum altitude of an A/C *
 c. Altitude of present flying
 d. None of these
128. During the final stages of an automatically controlled approach to runway, by an aircraft, an indication light in HSI connected to radio altimeter system comes at the altitude termed
 a. Approach altitude
 b. Decision height *
 c. Sealing height
 d. None of these
129. Mode controller of flight director system provides the functions of mode selection and
 a. Altitude hold
 b. Manual pitch command
 c. Both a. and b.*
 d. None of these
130. Rotary mode selector switch of FDS maintains its position at different mode by a pindrop and
 a. Detent *
 b. Clicker mechanism
 c. Retched mechanism
 d. A spring
131. Rotary mode selector switch of FDS has
 a. 2 positions
 b. 4 positions
 c. 3 positions
 d. 6 positions *
132. Position of the FDS rotary mode selector switch, that causes in ADI command bars to display a pitch-up command and a wings-level attitude is
 a. GA *
 b. OFF
 c. HDG
 d. VOR/LOC
133. Position of the FDS rotary mode selector switch , that disables the pitch/roll outputs from the computer causing the ADI command bars to be deflected out of view is
 a. GA
 b. OFF *
 c. HDG
 d. VOR/LOC
134. Position of the FDS mode selector switch , that allows selection of magnetic heading by means of a knob in HSI is
 a. GA
 b. OFF
 c. HDG *
 d. VOR/LOC
135. Position of FDS mode selector switch , at which computer pitch channel can be operated in the 'MANUAL PITCH' mode by means of pitch command selector is
 a. GA
 b. OFF
 c. HDG *
 d. MAN/GS
136. The position of FDS mode selector switch ,at which the pitch channel of computer can be operated in either the 'MANUAL PITCH' or 'ALT-HOLD' mode is
 a. HDG
 b. VOR/LOC
 c. Both a. and b.*
 d. None of these
137. Position of mode FDS selector switch, that allows selection of VOR radial or a localizer beam for lateral guidance is
 a. GA
 b. OFF
 c. HDG
 d. VOR/LOC *
138. Position of FDS mode, selector switch allows the ILS beams for lateral and vertical guidance during an automatic approach
 a. GA
 b. VOR/LOC
 c. AUTO/APPR *
 d. MAN/GS
139. To establish a fixed intercept angle of either a VOR or LOC beam in FDS, the position of mode selector required to be set is
 a. GA
 b. AUTO/APPR *
 c. VOR/LOC
 d. MAN/GS
140. When making an approach by aircraft , which is above the ILS beam; to force a GS beam to capture condition in FDS; the mode selector switch is ot be positioned in
 a. GA
 b. MAN/GS *
 c. AUTO/APPR
 d. VOR/LOC
141. In FDS , if it is known that the beam sensing circuit of the computer are inoperative; the position of mode selector switch required to be set to force a LOC or GS beam capture condition, is
 a. GA
 b. MAN/GS *
 c. AUTO/APPR
 d. VOR/LOC
142. To establish a command signal that positions , the ADI

- command bars in pitch as per the reference altitude sensed by an ADC, the switch operated in mode controller of FDS is
- Mode selector
 - Pitch command
 - 'ALT HOLD'*
 - Both a. and b.
143. The 'ALT-HOLD' switch in FDS mode controller is held in ON position by a
- Solenoid
 - Valid signal conditions
 - Toggle action
 - Both a. and b.*
144. In the FDS mode controller, if the mode selector switch is on GS Capture, the 'ALT-HOLD' switch on switching ON
- Will hold
 - Will not hold
 - Will hold first then go off automatically *
 - None of these
145. The mode controller unit of FDS has mode selector switch and
- 'ALT HOLD' switch
 - 'PITCH CMD' switch
 - COURSE SEL' switch
 - Both a. and b.*
146. 'PITCH COMMAND' knob in FDS mode controller has a minimum of 15° of pitch up command or pitch down command of
- 10°*
 - 15°
 - 20°
 - None of these
147. The position of mode selector switch in FDS-mode controller that does not provide for computer pitch channel operation in 'MANUAL PITCH' or 'ALT-HOLD' mode, is
- GA
 - OFF
 - VOR/LOC
 - Both a. and b.*
148. In FDS/AFCS mode controller, following serves the purpose of switching ON an output to the command bars of respective ADI and also control power to the annunciator panel
- Flight director switch *
 - Pitch control wheel
 - Heading selector
 - Course selector
149. In FDS/AFCS mode controller, following serves the purpose of controlling pitch command bars of respective ADI, when no other pitch mode is selected
- Flight director switch
 - Pitch control wheel *
 - Heading selector
 - Course selector.
150. In FDS/AFCS mode controller, following serves the purpose of establishing error signals for roll control and drives heading marker in HSI
- Flight director switch
 - Pitch control wheel
 - Heading selector *
 - Course selector
151. In FDS/AFCS mode controller, following, serves the purposes as of mode controller of FDS except 'INS' and 'LAND' position,
- Flight director switches
 - Heading selector
 - Pitch control, wheels
 - Nav-mode selector switch *
152. In FDS/AFCS mode controller, following serves the purpose connecting any one of two MHR systems provided in the concerned aircraft to establish course error signal drive HSI pointer
- Flight director switches
 - Heading selector
 - Course selectors *
 - Nav.mode selector switch
153. In FDS/AFCS mode controller, following is the three position switch for determining, which MHR and radio NAV receiver to be used
- Flight director switches
 - Course transfer switch *
 - Course selectors
 - Nav.mode selector switch
154. Purpose of flight mode in aircraft's having FDS/AFCS, is to annunciate by
- A pointer
 - A dot and a cross
 - Coloured lights *
 - Both a. & (c).
155. Purpose of flight mode in aircrafts having FDS/AFCS, is to annunciate by coloured lights, the conditions appropriate to
- Flight mode failed
 - Flight mode & needs correction
 - Flight mode selected *
 - None of these
156. For the purpose of identification that which selected in FDS/AFCS mode controller, the device utilized in aircraft
- Flight data computer
 - Flight mode annunciators *
 - Air data computer
 - Annunciator window
157. The lights that are grouped at the left of the panel of flight mode annunciators of FDS/AFCS, relates to
- AFCS
 - FDS *
 - Both a. and b.
 - None of these.
158. The lights that are grouped at the right of the panel of flight mode annunciators of FDS/AFCS relates to
- AFCS *
 - FDS
 - Both a. and b.
 - None of these
159. FDS group in approach progress display of FDS / AFCS flight mode annunciators consists of VOR / LOC light,
- Glide slope light
 - GA light
 - ALT / S light
 - Both a. and b.*

160. In flight mode annunciator of AFCS / FDS, if a VOR or LOC mode is selected the VOR / LOC light illuminates
- Red
 - Green
 - Amber *
 - Blue
161. In flight mode annunciator of AFCS / FDS, if a VOR or LOC mode is selected, the colour of VOR / LOC light comes is
- Amber on selection
 - Green on capture of beam
 - Both a. and b.*
 - None of these
162. In flight mode annunciator of AFCS / FDS, when approach mode is selected, the colour of light, that come ON is
- Glide slope-amber *
 - Glide slope-red
 - Glide slope-blue
 - None of these
163. When GS beam has been captured, the light of flight mode annunciator of AFCS / FDS, will change from
- Green to amber
 - Amber to green *
 - Green to red
 - Amber to red
164. The GA annunciator light illuminates green whenever the GA mode in AFCS / FDS is selected as a result of automatic approach is to be
- Engaged
 - Referred
 - Aborted *
 - None of these
165. GA mode in AFCS / FDS refers to
- Ground angle
 - Guided angle
 - Go around *
 - None of these
166. On selecting the GA mode in FDS / AFCS to abort the automatic approach of A/C to runway, the colour of light, that will come on in flight mode annunciator is
- Red
 - Green *
 - Amber
 - Blue
167. In FDS / AFCS flight mode annunciator, in addition to the VOR / LOC and glide slope, the AFCS group of display, has annunciator lights for
- Altitude select
 - Altitude hold
 - Altitude failed
 - Both a. and b.*
168. Lights of FDS / AFCS, flight mode annunciator may be checked for functioning by
- Individual press to test facility *
 - Collective press to test facility
 - A separate test button
 - None of these
169. In FDS / AFCS flight mode annunciator, whenever a mode selected, lights are so arranged that captions appropriate to each mode are illuminated
- Green
 - White *
 - Red
 - Amber
170. In FDS / AFCS, the shape of go-around annunciator light is
- ball-shaped symbol
 - bulb shaped
 - arrow shaped *
 - none of the above
171. What colour of light is illuminated when the associated manoeuvre has been initiated by activation of go around switched on engine thrust levers
- red
 - yellow
 - green *
 - white
172. In FDS / AFCS testing of white and green lights is done by
- depressing the cap of FDS 'ALT / S'
 - pulling the cap of FDS 'ALT / S'
 - both of the above
 - none of the above *
173. In FDS / AFCS flight mode annunciator, when the desired function has been satisfied, the lower half of the each light is illuminated by
- yellow
 - red
 - blue
 - green *
174. Which of the following light / lights can be tested by depressing the cap of the FDS 'ALT / S' annunciator
- green
 - white
 - green and white both *
 - none of the above
175. In FDS, flight mode annunciator, red light may be checked by depressing the cap of the
- FDS 'ALT / S'
 - AFCS 'ALT / S' *
 - either by FDS 'ALT/S' or AFCS 'ALT/S'
 - none of the above
176. In FDS, red lights on flight mode annunciator may be checked by depressing the cap of the AFCS 'ALT/S' annunciator, together with a
- blue light *
 - green light
 - yellow light
 - both blue and green
177. In FDS / AFCS, flight mode annunciator, dimming of light is controlled by
- one photo cell
 - two photo cells *
 - three photo cells
 - four photo cells
178. In FDS, GO around switches are located on
- instrument panel
 - engine power levers *
 - engine power pulley
 - none of the above
179. GA switches (FDS) can be conveniently operated by the palm of the hand, hence they are made of
- momentary press type *
 - continuous press type
 - press to test type
 - none of the above

180. When an automatic approach has to be aborted, engine thrust
- has to be decreased
 - has to be increased *
 - remain same
 - none of the above
181. When an automatic approach have to be aborted, the FDS
- has to go to GA mode *
 - need not to go to GA mode
 - has to go to Gyro mode
 - none of the above
182. When an automatic approach has to be aborted, the FDS go to GA mode by switches located on
- instrument panel
 - engine panel
 - engine power levers *
 - none of the above
183. Closing of Go-around switches places the computer in a GA mode, and it then provides pre-set bias signals to each pilot's ADI, causing the commands bar to deflect to
- pitch down command position
 - pitch down and wings level command position
 - pitch up and wings level command position *
 - wings level only command position
184. Assuming A/C is flying at a heading of 90° and there are no command signals to ADI, so ADI will display
- roll attitude
 - level flight attitude *
 - pitch attitude
 - none of the above
185. To change the heading position from 90° to 180° on compass card in HSI, which knob is rotated
- course selector knob
 - heading select knob *
 - none of the above
186. To attain a new signal from 90° to 180°, the heading error CT synchro in HSI sends a command signal to which unit
- HSI
 - RMI
 - VSI
 - ADI *
187. When HSI sends a command signal to ADI via computer roll channel, the command bars are deflected to
- right or left *
 - up or down
 - in any direction
 - no deflection of common bars
188. During turn at correct bank attitude, what will be the position of command bars
- no change of command bars *
 - command bars are centered
 - command bar does not come in operation
 - none of the above
189. During turn, MHRS detects the heading change and gives signal to
- VSI
 - ADI
 - HSI *
 - none of the above
190. During turn, signals of heading change are given to HSI by which of the following
- HUD
 - MHRS *
 - DGU
 - VDU
191. When heading change, signals are given to HSI
- compass card does not move
 - compass card rotates *
 - none of the above
192. During turn, when heading signals are fed to HSI in which direction compass card rotates
- same direction to turn
 - opposite direction to turn *
 - compass card does not rotate
 - none of the above
193. During turn compass card rotates in opposite direction to turn because
- MHRS is continuously being slaved to Magnetic North *
 - HSI is slaved to magnetic North
 - MHRS is not slaved
 - none of the above
194. In order to fly on to a required VOR beam radial, which knob is rotated to set the course marker and deviation bar
- ready selector knob
 - course selector knob *
 - press to test bottom
 - none of the above
195. On an approach progress display type of unit, the VOR / LOC light will illuminate
- green
 - red
 - amber *
 - yellow
196. When control is taken over by the VOR which light will illuminate on annunciator unit
- amber
 - green *
 - red
 - none of the above
197. During LOC mode, prior to beam capture, when 'ALT HOLD' is on, which light will illuminate on GS annunciator
- green
 - amber *
 - yellow
 - red
198. During LOC mode, at beam capture, which light will illuminate
- red
 - yellow
 - amber
 - green *
199. During LOC mode, at beam capture, when light illuminates green 'ALT HOLD' mode is
- connected
 - disconnected *
 - remain unchanged
 - none of the above
200. During LOC mode, at beam capture, a pitch down bias signal is supplied to ADI to deflect to command bar to
- 1° down
 - 2° down *
 - 2° up
 - 4° down

201. In LOC mode, to allow for convergence, first stage programming is carried out at what altitude
- 300 ft a radio altitude
 - 150 ft radio altitude
 - 1500 ft radio altitude *
 - 200 ft radio altitude
202. In LOC mode, to allow for convergence, second stage programme is carried out at what altitude
- 2000 ft radio altitude
 - 200 ft radio altitude *
 - 1500 ft radio altitude
 - 150 ft radio altitude
203. In most aircraft, dual systems in dual flight director system are installed, one is for the captain, other is for
- first officer *
 - second officer
 - navigator
 - none of the above
204. In dual flight director system from where the signals are supplied to the captain's ADI
- from VGU No. 1 *
 - from VGU No. 2
 - from both VGU 1 and 2
 - none of the above
205. In dual flight director system, from where the signals to first officer's ADI are supplied
- from VGU No. 1 *
 - from VGU No. 2
 - from both VGU 1 and 2
 - none of the above
206. What happens in the event of failure of VGU No.1 ?
- No. 1 transfer relay is de-energised
 - No. 1 transfer relay is energised *
 - No. 2 transfer relay is energised
 - No. 2 transfer relay is de-energised
207. In the event of failure of VGU No. 1, what happens ?
- No. 1 transfer relay is energised
 - No. 2 transfer relay is de-energised
 - No. 1 transfer relay is de-energised
 - No. 2 transfer relay is energised *
208. In the event of failure of VGU No. 1, the captain's ADI is supplied with attitude signals from where ?
- VGU No. 1
 - VGU No. 2 *
 - from both a. and b.
 - none of the above
209. What does VOR stands for ?
- vertical operation reference
 - very often required
 - very high frequency omnidirectional range *
 - none of the above
210. What does AFCS stands for ?
- Air force command system
 - Automatic flight command system
 - Automatic flight control system *
 - none of the above
211. What does VGU stands for
- vertical gyro unit *
 - very high frequency gyro unit
 - visual gyro unit
 - none of the above
212. In some dual system, an auxiliary VGU is provided to provide attitude reference signals to
- either ADI, in event of failure of main VGU
 - both ADI in event of failure of main VGU
 - either or both ADI in event of failure of main VGU*
 - none of the above
213. The INOP annunciator on the transfer switch panel monitors the auxiliary VGU
- sometimes
 - at all times *
 - whenever required
 - none of the above
214. What is the purpose of instrument comparator and warning system
- to compare roll and yaw attitude signals
 - to compare turn and pitch attitude signals
 - to compare roll and pitch attitude signals *
 - none of the above
215. Instrument comparator and warning system consists of
- computer unit and annunciator panels
 - comparator unit and annunciator panel *
 - comparator unit and warning panel
 - none of the above
216. The Front panel of comparator of Inst. comparator and warning system consists of
- 6 green lights
 - 4 amber lights
 - 6 amber lights *
 - 4 green lights
217. The front panel of comparator of Inst. comparator and warning system consists of 6 amber lights with amber light on annunciator panel
- in series
 - in parallel *
 - not connected
 - none of the above
218. Failure of a comparator power supply is indicated by
- green 'power/mon' light
 - blue 'power/mon' light
 - red 'power/mon' light *
 - none of the above
219. Differential resolver synchros in captain's HSI and ADI are supplied by comparator with
- 30 VDC
 - 26 VDC
 - 26 V AC *
 - 115 V AC
220. When HSI interfaced with INS, how many warning flag does it incorporates ?
- two warning flags
 - three warning flags *
 - four warning flags
 - five warning flags

221. Which of the following flags HSI does not incorporate
- 'Heading' flag
 - navigation warning flag
 - 'GS' flag
 - 'pitch' warning flag *
222. Which flag comes into view when there is a loss of input from an operating radio navigation receiver or INS
- heading light
 - navigation warning flag *
 - GS warning flag
 - none of the above
223. Which flag obscures the heading reference whenever there is an invalid heading reference
- heading flag *
 - GS flag
 - navigator warning flag
 - radio warning flag
224. Which flag obscures the glide scope scale whenever the revellent signal is invalid
- heading flag
 - 'GS' flag *
 - radio flag
 - none of the above
225. Whenever the relevant signal is invalid a 'GS' flag obscure
- heading reference
 - radio navigation receiver
 - glide slope scale *
 - none of the above
226. Under normal operating conditions, the captain's transfer switch is set at position 1 so that the ADI is supplied with attitude data from
- INS 1 *
 - INS 2
 - GS1
 - GS2
227. Under normal operating conditions, the first officer's transfer switch is set at position No. 2 to supply in ADI with data from
- INS No 1
 - GS No 1
 - INS No 2 *
 - GS No 4
228. Under normal operating conditions, at which position the captain's transfer switch is set
- position No. 2
 - position No. 1 *
 - either position 1 or 2
 - none
229. In the event of failure of data from INS No. 1, from where the data can be transferred to captain's ADI
- from INS No. 1
 - from INS No. 2
 - from INS No. 3 *
 - from INS No. 4
230. In the event of failure of data from INS No. 1, the data established by INS No. 3 can be transferred to captain's ADI by setting the switch to which position
- position No. 1
 - position No. 2
 - position No. 3 *
 - position No. 4
231. For transmission of radio navigator data the main placards 'radio/INS' must each can be selected to the
- 'radio' position *
 - 'radar' position
 - either radio or radar position
 - none of the above
232. For the transmission of Radio Navigation data, in normal, the captain's switch is set to which position
- position No. 1 *
 - position No. 2
 - position No. 3
 - position no. 4
233. For the transmission of Radio Navigation data, in normal position, the first officer's switch is set to which position
- position No. 1
 - position No. 2 *
 - position No. 3
 - position No. 4
234. When captain's radio transfer switch is set at position No. 1, his ADI and HSI are supplied signals from
- VHF navigation receiver No. 2
 - VHF navigation receiver No. 1 *
 - UHF navigation receiver No. 1
 - UHF receiver No. 2
235. When first officer's radio transfer switch is set at position No. 2, ADI and HSI are supplied signals from
- No. 1 navigator receiver
 - No. 2 navigator receiver *
 - No. 3 navigator receiver
 - none of the above
236. During transmission of Radio navigation data, in the event of failure of receiver No. 1, captain's transfer switch is set to which position ?
- No. 1 position
 - No. 2 position *
 - No. 3 position
 - No. 4 position
237. During transmission of radio navigation data, in the event of failure of receiver No. 1. first officer's transfer switch is set to which position ?
- position No. 1
 - position No. 2 *
 - position No. 3
 - position No. 4
238. Transfer switches are
- mechanically inter locked
 - electrically inter locked *
 - not interlocked
 - unlocked
239. Transfer switches are electrically interlocked such that once transfer of data has been selected from one side, a transfer from the other side
- can be effected
 - can not be effected *
 - can be selected
 - none of the above
240. Depending on the setting of the 'RADIO / INS' selector switches, heading data may be displayed on each pilot is HSI as
- always magnetic heading

- b. true heading
 - c. either magnetic or true heading *
 - d. none of the above
241. Since both RMI are part of each MHRS, they always indicate
- a. true heading
 - b. magnetic heading *
 - c. either magnetic or true heading
 - d. none of the above
242. What does ADI stand for ?
- a. automatic director indicator
 - b. attitude director indicator *
 - c. air data indicator
 - d. automatic direction instrument
243. What does MHRS stand for ?
- a. magnetic heading receiving system
 - b. magnetic heading receiving signals
 - c. magnetic heading reference system *
 - d. master heading reference system

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CHAPTER - 30

INERTIAL NAVIGATION / REFERENCE SYSTEMS (INS / IRS)

1. The requirements of Navigation of an aircraft is to determine its position in relation to
 - a. its point of departure *
 - b. its points en-route in order to reach a new destination
 - c. both of the above
 - d. none of the above
2. What does INS stands for
 - a. Instrument navigation system
 - b. Inertial navigation system *
 - c. Integral navigation system
 - d. Intertial nautical system
3. INS used is some types of aircraft utilizes
 - a. analog signal processing technique
 - b. digital signal processing technique
 - c. analog and digital processing technique *
 - d. none of the above
4. What does CDU stands for ?
 - a. central display unit
 - b. centre and display unit
 - c. control and display unit *
 - d. control data unit
5. What does MSU stands for in INS / IRS ?
 - a. magnetic signal unit
 - b. mode selector unit *
 - c. mode signal unit
 - d. none of the above
6. For turning the INS / IRS system 'ON', we need
 - a. Inertial navigation unit
 - b. mode selector unit
 - c. control display unit
 - d. battery unit *
7. For turning the INS / IRS 'ON', battery unit provides
 - a. AC power
 - b. DC power *
 - c. AC and DC power
 - d. none of the above
8. Name the unit which provides back - up in the event that power from an air craft's system is interrupted
 - a. INU
 - b. CDU
 - c. battery unit *
 - d. MSU
9. In inertial reference unit (IRU) gyroscope is of
 - a. spinning rotar type
 - b. ring laser type *
 - c. both a. and b.
 - d. none of the above
10. No battery unit and charger is used in
 - a. IRS *
 - b. INS
 - c. both IRS and INS
 - d. none of the above
11. For INS / IRS, power required is
 - a. AC
 - b. DC
 - c. AC and DC both *
 - d. none of the above
12. In a typical gimballed - plate form INS, the AC power is supplied from
 - a. bush bar *
 - b. nickel cadmium battery unit
 - c. cell
 - d. both a. and b.
13. In a typical gimballed - plate form INS, the DC power is supplied from
 - a. bush bar
 - b. nickel cadmium battery unit *
 - c. cell
 - d. both a. and b.
14. In INS in the event of AC power failure, the battery unit will sustain system operation in any operating mode for a period of
 - a. 5 minutes
 - b. 15 minutes *
 - c. 15 seconds
 - d. 5 seconds
15. Indication that battery power is in use in INS is provided by illumination of
 - a. an amber 'BATT' light *
 - b. a green 'BATT' light
 - c. a red 'BATT' light
 - d. a yellow 'BATT' light
16. A battery charger in INU comes into operation
 - a. when its voltage drops below 26.5 V
 - b. battery is not in use
 - c. in both the case (a. and b.) *
 - d. none of the above
17. A battery charger in INU is disconnected where the on - charge voltage increases to
 - a. 26.5V
 - b. 29.5 V *
 - c. 115V
 - d. 24V
18. Earth is a
 - a. circle
 - b. a rectangle
 - c. a true sphere
 - d. not a true sphere *
19. Equatorial diameter of earth is
 - a. 6844 nautical miles
 - b. 6684 nautical miles
 - c. 6884 nautical miles *
 - d. 4886 nautical miles

20. Earth's equatorial diameter of 6884 nautical miles exceeds its polar diameter by
 a. 32 nautical miles b. 12 nautical miles
 c. 23 nautical miles * d. 21 nautical miles
21. The flattening at the polar regions gives rise to a more precise definition of earth's form, which is known as
 a. absolute spheroid b. oblate spheroid *
 c. oblate spheroid d. none of the above
22. For practical navigation purposes, however, earth can be considered as
 a. a circle b. roundel
 c. sphere * d. rectangle
23. Direction on the earth is measured in
 a. kilometers b. seconds
 c. degrees * d. degree centigrade
24. Direction of the earth is measured in degrees
 a. clockwise from north *
 b. anticlockwise from north
 c. clockwise from the south
 d. clockwise from east
25. Earth rotates from
 a. east to west b. west to east *
 c. north to south d. south to north
26. _____ and _____ define the axis about which the earth rotates from west to east
 a. north and east b. north and south *
 c. south and west d. south and east
27. A three figure group is always used to indicate the direction e.g.
 a. North 090°, South 000°, East 180°, West 270°
 b. North 270°, South 000°, East 180°, West 090°
 c. North 180°, South 090°, East 000°, West 270°
 d. North 000°, South 180°, East 090°, West 270°*
28. The equator and all the lines joining _____ and _____ cardinal points (the earth's pole) are example of great circles
 a. East and west b. North and East *
 c. North and South d. South and East
29. On a plain surface, the shortest distance between two points is a
 a. great circle
 b. small circle
 c. curved line which joins them
 d. straight line which joins them *
30. On a sphere, the shortest distance between two points is the _____ which passes through both points
 a. small arc of the great points *
 b. big arc of the great circle
 c. straight line
 d. none of the above
31. Great circle is a circle on the surface of a sphere, whose
 a. centre is those of sphere itself
 b. radius is those of sphere itself
 c. centre and radius are those of sphere itself *
 d. none of the above
32. Small circle is on the surface of a sphere whose
 a. centre is of sphere itself
 b. radius is not of sphere itself
 c. centre and radius are not those of sphere itself *
 d. none of the above
33. Except Equator, all lines of latitude are
 a. small circles * b. great circles
 c. meridians d. cardinal points
34. Small circles _____ the shortest distance between two points
 a. represents b. do not represent *
 c. can represent d. none of the above
35. Half of the great circle which passes through Greenwich and is 000° is known as
 a. The Prime or Greenwich Meridian *
 b. Anti Meridian
 c. Both a. and b.
 d. none of the above
36. Half of the great circle which passes through Greenwich and is 180° is known as
 a. The Prime Greenwich Meridian
 b. Anti Meridian *
 c. Both a. and b.
 d. none of the above
37. Other great circles in the form of Meridians are called
 a. lines of longitude * b. lines of latitude
 c. straight lines only d. equator
38. Lines of longitude are established
 a. only to the east of prime meridian
 b. only to the west of prime meridian
 c. to the east and to the west of prime meridian *
 d. neither to the east or west of the prime meridian
39. The great circle (equator) is
 a. 0° latitude * b. 90° latitude
 c. 30° latitude d. 45° latitude
40. Longitude is expressed in
 a. degrees only b. degrees and minutes *
 c. minutes d. seconds
41. Longitude is annotated
 a. north b. south
 c. east d. east or west *
42. Latitude is annotated
 a. north of equator
 b. south of equator
 c. west of equator

- d. north or south of equator *
43. Whole network of meridians (longitude and latitude) imagined to cover earth is called
 a. graticule * b. great circle
 c. small circle d. none of the above
44. Parallels of latitude are
 a. small circle * b. great circles
 c. equators d. lines of longitude
45. The latitude of London Heathrow is arc of meridian between
 a. equator and heathrow *
 b. prime meridian and heathrow
 c. equator and prime meridian
 d. none of the above
46. Latitude of London Heathrow is
 a. 51 degrees and 28 minutes N *
 b. 28 degrees and 51 minutes N
 c. 51 minutes and 28 seconds N
 d. 28 minutes and 51 seconds N
47. 51 degrees and 28 minutes is expressed as
 a. 51'28° b. 51°28"
 c. 51°28' * d. 51"28°
48. The longitude of London Heathrow is
 a. 00 degree and 27 minute W *
 b. 00 degree and 27 minutes N
 c. 27 degree and 00 minutes W
 d. 27 degree and 00 minutes N
49. Convergency may be obtained from the formula (if 2 faces are of same latitude)
 a. convergency = change in longitude x cosine of latitude *
 b. convergency = change in longitude x sine of latitude
 c. convergency = change in latitude x sine of longitude
 d. convergency = change in latitude x cosine to latitude
50. Convergency is
 a. maximum at equator
 b. minimum at equator
 c. zero at the equator *
 d. none of the above
51. Convergency
 a. increases to maximum at the poles *
 b. decreases to minimum at the poles
 c. remains same
 d. none of the above
52. Ch long stands for
 a. change of latitude
 b. change of longitude *
 c. characteristics of latitude
- d. characteristics of longitude
53. Ch Lat stands for
 a. change of latitude *
 b. change of longitude
 c. characteristics of latitude
 d. characteristics of longitude
54. Meridians and the equator are the only examples of great circles which are also
 a. straight lines b. curved lines
 c. rhumb lines * d. none of the above
55. Parallels of latitude are rhumb-lines because all meridians at
 a. 90° * b. 60°
 c. 45° d. 30°
56. Nautical mile is a unit of
 a. distance * b. speed
 c. air speed d. none of the above
57. One nautical mile (nm) equals one minute of latitude and is an average distance of
 a. 8060 ft b. 6080 ft *
 c. 8060 meter d. 6080 meter
58. 1° latitude is equal to
 a. 60 nm * b. 120 nm
 c. 90 nm d. 180 nm
59. A change of latitude from the equator to pole is equal to
 a. 5400 nm * b. 4500 nm
 c. 4400 nm d. 6400 nm
60. Statute mile equal to
 a. 5280 ft * b. 8250 ft
 c. 2850 ft d. 5820 ft
61. 1 kilometer is equal to _____ of average distance from equator to either pole
 a. 1/1,000th b. 1/100th
 c. 1/10,000th* d. 1/1,00,000th
62. 1 kilometer is equal to
 a. 8320 ft b. 1000 ft
 c. 3280 ft * d. 3082 ft
63. The direction in which the nose of an AC is pointing is known as
 a. track b. course
 c. drift d. heading *
64. Heading of an aircraft is measured in
 a. knots b. nautical miles
 c. degrees * d. minutes
65. The direction in which an aircraft is moving over the earth

- a. heading b. track *
c. drift d. none of the above
66. The planned direction over the earth in which it is intended the aircraft shall move is called
a. track b. desired track *
c. heading d. runway
67. The angle between heading and track due to the effect of wind is
a. desired track b. track
c. drift * d. heading
68. DSR TK in navigation terms stands for
a. disturbed track b. desired target
c. deserve track d. desired track *
69. HDG in navigation term stands for
a. hydrogen b. heading *
c. head up gyro d. head down gyro
70. If TK is less than HDG, drift is to the
a. right b. left *
c. any side d. none of the above
71. If TK is greater than HDG, drift is to the
a. right *
b. left
c. either left or right
d. none of the above
72. The actual speed (in knots) of an aircraft over the ground is
a. indicated air speed b. true air speed
c. ground speed * d. glide speed
73. If there were no wind, ground speed would be equal to
a. indicated air speed b. true air speed *
c. ground speed d. glide speed
74. The angle, measured in degrees clockwise from true north with respect to direction from which the wind is blowing is
a. drift angle b. track angle
c. wind direction * d. heading
75. The speed, in knots, at which the air is moving relative to the ground
a. wind speed * b. ground speed
c. aircraft speed d. take off speed
76. The angle between desired track and actual track of an a/c is
a. drift angle b. track angle error *
c. drift angle error d. none of the above
77. Cross track distance is the distance in nm measured from nearest point on the _____ to the aircraft
a. cross track line b. drift track line
c. actual track line d. desired track line *
78. A point of navigational significance on air route is known as
a. cardinal point b. focal point
c. way point * d. landing point
79. WPT in navigational terms stands for
a. without power transport
b. wide pilot tube
c. way point *
d. none of the above
80. Typically, routes are divided up into convenient _____, defined at each end by a WPT
a. lengths or legs * b. lengths or widths
c. width or arms d. head or tails
81. Velocity is the rate of change of displacement with respect to
a. acceleration b. time *
c. mass d. weight
82. Velocity is composed of
a. speed only
b. direction only
c. speed and direction both *
d. neither speed nor direction
83. If speed of an object is constant but its direction is changing, then its velocity
a. remain constant b. changes *
c. has no effect d. will be zero
84. A change in velocity _____ is an acceleration.
a. in magnitude of motion
b. in direction of motion
c. either in magnitude or direction of motion *
d. none of the above
85. All matter tends to return to its existing state of motion and resist any changes to that state, this property is known as
a. resistivity b. inertia *
c. elasticity d. electricity
86. The rate of acceleration of a body is proportional to the magnitude of inertia
a. statement is true *
b. statement is not true
c. cannot say
87. In dual axis, accelerometer, two sensors are mounted on a platform is
a. vertical plane
b. horizontal plane *
c. both vertical and horizontal plane
d. none of the above
88. There are two mounting arrangements of accelerometer, one is Gyro stabilised platform and other is
a. step down b. step up
c. strap down * d. strap up

- a. piston pick - off b. position pick - off *
c. position take - off d. position turn - off
133. In INS, each gyroscope is maintained at an operating temperature of
a. 67° C b. 37° C
c. 76° C * d. 90° C
134. Each gyroscope is maintained at an operating temperature 76° C by a _____ blanket type heating element wrapped around the main casing
a. 20 watt b. 40 watt
c. 60 watt d. 30 watt *
135. Ring laser gyroscope is essentially a
a. rate sensor * b. earth sensor
c. tied sensor d. space sensor
136. RLG stands for
a. remote light gyroscope
b. resistance less generator
c. radar laser gyroscope
d. ring laser gyroscope *
137. RLG (ring laser gyro) has
a. rotating mass
b. gimbal system
c. gimbal system but no rotating mass
d. no rotating mass or gimbal system *
138. RLG, a rate sensor is a triangular block of fabricated glass (cirvit glass) which is
a. soft b. mild
c. extremely hard * d. none of the above
139. Fabricated glass of RLG is very hard and it
a. can expand under varying temperature conditions
b. can contract under varying temperature conditions
c. expand or contract under varying temperature conditions
d. does not expand or contract under varying temperature conditions *
140. The cavity of RLG triangular block is filled with a lasing medium
a. helium b. methan - eathene
c. helium - neon * d. neon
141. In RLG triangular block
a. two cathodes and one anode is located
b. two cathodes and two anodes are located
c. a cathode and two anodes are located *
d. a cathode and a anod is located
142. RLG sensor works on the principle of
a. rigidity
b. precession
c. transformer principle
d. interferometer principle *
143. RLG, eliminates the use of complex platform levelling system, and its _____ output signals can be supplied directly to navigation computer
a. altitude b. attitude *
c. heading d. rolling
144. In RLG, frequency is determined by
a. fluid b. gas, that is methane
c. gas , that is lasing * d. none of the above
145. Frequency (RLG system) can be changed (varied. by changing the
a. radius of beam b. cavity rotation
c. length of path * d. none of the above
146. What does CDU stands for in IN / IR system
a. central display unit
b. control and display unit *
c. control display unit
d. central digital unit
147. In mode selector unit of IN / IRS flight deck panel STBY mode is for
a. normal in-flight operation
b. ground use only *
c. for ground as well as flight use
d. for aligning INS to its true north point
148. In mode selector unit of INS / IRS flight deck panel ALIGN mode allows to align automatically to its
a. true north point * b. true east point
c. true west point d. true south point
149. In ALIGN mode (mode select unit); when alignment completed "READY NAV" light illuminate
a. blue b. red
c. amber d. green *
150. The INS is not affected by movements of the ac while
a. ALLIGN mode b. NAV mode
c. STBY mode * d. ATT REF mode
151. 'READY NAV' green light in ALLIGN mode indicate that system is ready to go into
a. STBY mode b. ALLIGN mode
c. NAV mode * d. ATT REF mode
152. The aircraft must remain stationary in
a. NAV mode b. ALLIGN mode *
c. ATT mode d. In all the modes
153. Following mode must be selected before the aircraft moves from its parked position
a. STBY mode b. ALLIGN mode
c. NAV mode * d. ATT REF mode
154. Which mode selects pitch roll and platform heading stablisation outputs only
a. STBY mode b. NAV mode
c. ALLIGN mode d. ATT REF mode *

155. Following mode selection is only when a computer failure has occurred
 a. STBY mode b. NAV mode
 c. ATT REF mode * d. ALLIGN mode
156. The selector s/w is provided with two mechanical stop, one between the "STBY and ALLYN" mode position and other between
 a. STBY and NAV mode position
 b. NAV and ATT mode position *
 c. NAV and STBY mode position
 d. ATT and STBY mode position
157. In order for the selector knob to move over the stops, it must be
 a. pushed in b. pulled out *
 c. rotated clockwise d. rotated anti clockwise
158. The reason for having the stops is to prevent the following mode from being inadvertently switched out
 a. STBY mode b. NAV mode *
 c. ATT REF mode d. ALLIGN mode
159. What is the minimum required voltage to operate the system
 a. 24 VDC b. 24 V AC
 c. 18 V DC * d. 18 V AC
160. When back up dc voltage is being used, and is less than the minimum required to operate the system, which light illuminates
 a. green battery light b. red 'BATT' light *
 c. amber 'BATT' light d. blue 'BATT' light
161. In initial reference mode panel how many modes are selected
 a. 2 b. 3 *
 c. 4 d. 5
162. In IR mode panel which of the following mode is not selected
 a. STBY mode * b. NAV mode
 c. ATT mode d. ALLIGN mode
163. A STBY mode is not required for the reason that application of comprehensive digital signal processing techniques and of RLG, eliminates the need to allow for
 a. warm up
 b. gyroscope run up
 c. warm up and gyroscope run up *
 d. none of the above
164. In inertial reference mode panel in IR system, when a system is in alignment mode ALLIGN illumination
 a. green b. white *
 c. red d. yellow
165. In inertial reference mode panel in IR system, in the event of alignment procedure failure - ALLIGN
 a. illuminates red b. flashes green c. flashes on and off * d. illuminates white
166. In IR mode panel, to indicate that power to the system has automatically changed over from 115 V AC to 28 V DC (from battery system) on DC, illuminates
 a. red b. green
 c. white d. amber *
167. In IR mode panel, when battery power source drops below 18 V DC FAIL illuminates
 a. amber * b. green
 c. white d. red
168. In IR mode panel, when failure in the system are detected FAULT illuminates
 a. green b. red
 c. amber * d. white
169. Longitude and latitude data from any of the 3 systems (left, -center - right) are selected, for read out on single display at the
 a. bottom of the panel
 b. top of the panel *
 c. left side of the panel
 d. right side of the panel
170. Which control switch of CDU, selects the navigational data for presentation in the upper left and right numerical display of the unit
 a. data selector * b. WPT selector
 c. data key board d. WPT change
171. Which control switch of CDU is of thumb wheel type
 a. data selector b. WPT selector *
 c. data key board d. WPT change
172. WPT selector s/w of CDU enables WPTs 1 to 9 to be selected for latitude and longitude insertion when
 a. WPT selector s/w in set to DATA
 b. WPT selector s/w is set to 'WPT'
 c. DATA selector s/w is set to 'DATA'
 d. DATA selector is set to WPT *
173. WPT selector s/w of CDU is also used for inserting and displaying latitude, longitude, altitude and frequency of up to
 a. 7 DME stations b. 8 DME stations
 c. 9 DME stations * d. 10 DME stations
174. Data key board control s/w of CDU contains _____ push button key s/ws
 a. 8 b. 9
 c. 10 * d. 11
175. Each button of data key board control s/w of CDU
 a. illuminates white when pressed *
 b. illuminates green when pressed
 c. illuminates yellow when pressed
 d. illuminates amber when pressed
176. On DATA KEY BOARD of CDU in IN / IR system,

- following keys enable altitude and frequency to be displayed
- 2 or 8
 - 3 and 9 *
 - 4 or 6
 - 7 or 9
177. On DATA KEY BOARD of CDU in IN / IR, system, following keys enable altitudes to be loaded
- 2 or 8 *
 - 3 and 9
 - 4 or 6
 - 7 and 9
178. On DATA KEY BOARD of CDU, in IN / IR system, the following keys enable frequency to be loaded
- 7 and 9
 - 2 and 8
 - 3 or 9
 - 4 or 6 *
179. On DATA key board of CDU, in IN / IR system 7 and 9 keys enable
- altitude to be loaded
 - frequency to be loaded
 - latitude and longitude to be loaded *
 - altitude and frequency to be displayed
180. When DME data is being used in CDU -
- 'TO' display remain blank and 'From' display flashes the station number
 - 'From' display remain blank and 'TO' display flashes the station number *
 - Both TO and FROM display remain blank
 - Both TO and FROM display flashes the station number
181. Operation of which push button s/w in CDU, transfers entered data into the computer
- CLEAR
 - DATA SELECTOR
 - INSERT *
 - REMOTE
182. CLEAR 'push button s/w in CDU, control switches, is used to
- load the data into computer
 - erase data loaded into computer
 - erase data loaded into displays but not yet loaded into computer *
 - insert data into displays
183. CLEAR push button s/w in CDU control switches illuminates
- green
 - white *
 - amber
 - yellow
184. Which position enables checks to be made on displays and annunciators in AUTO / MAN / TEST switches of CDU
- 'AUTO'
 - 'MAN'
 - 'AUTO' / 'MAN'
 - 'TEST' *
185. WPT (or TK) CHANGE S/W in CDU, allows initiation of manual TK leg change and illuminates _____ when pressed
- white *
 - green
 - amber
 - red
186. Which of the following switches of CDU, illuminates white when pressed, permits a position check and a display of malfunction
- REMOTE
 - HOLD *
 - POSITION
 - AUTO / MAN / TEST
187. Remote S/W of CDU switches, enables semi automatic, auto fill operator, remote ranging and illuminates _____ when pressed
- Green
 - White
 - Amber *
 - Yellow
188. How many annunciators are there in CDU of IN / IR system
- Two
 - Three *
 - Four
 - Five
189. Three annunciators of CDU in IN / IR system are
- ALERT, REMOTE and WARN
 - REMOTE, BATT and WARN
 - ALERT, BATT and WARN *
 - ALERT, REMOTE and BETT
190. ALERT annunciator illumination _____ reaching a 'T' WPT
- Amber, five minutes before
 - White, two minutes before
 - White, five minutes before
 - Amber, two minutes before *
191. The operation of ALERT annunciator of CDU in IN / IRS depends on the setting of
- WPT (or TK) CHANGE S/W
 - AUTO / MAN / TEST / SW *
 - DATA SELECTOR SW
 - REMOTE S/W
192. ALERT annunciator light flashes as the a/c flies over WPT AUTO/MAN / TEST is at
- 'MAN' *
 - 'AUTO'
 - 'TEST'
 - 'AUTO' / 'TEST'
193. When INS is operating on battery power BATT annunciator illuminates
- Green
 - Red
 - Yellow
 - Amber *
194. 'WARN' annunciator of INS, illuminates _____ when system malfunction occurs
- Red *
 - Amber
 - Green
 - White
195. What does DME stands for in IN system
- Distance measuring equipment *
 - Diesel mechanic engine
 - Digital measuring equipment
 - Decision making equipment
196. The procedure that provides capability of moving the gimble platform of an INS about pitch and roll axis is called

- a. sequence b. Slewing * c. 'WARN' light comes on and off
c. Selecting d. Stablising d. none of the above
197. The slew rate of pitch and roll is
a. 1° / min b. 2° / min *
c. 2° / sec d. 1° / sec
198. _____ can be used to verify the integrity of wiring, to calibrate a weather radar and flight director HSI or ADI displays
a. sequencing b. stablisation
c. horoscope d. slewing *
199. In case of an INS malfunction _____ annunciator light on CDU is illuminated
a. ALERT b. DANGER
c. MALFUNCTION d. WARN *
200. To determine the cause of warning and action to be taken a _____ is programmed into computer
a. code numbering system *
b. serial numbering system
c. no system
d. correction system
201. Code numbers are made to appear in right hand display of CDU by moving display selector switch to the
a. 'DSR TK / STS position and by operating test s/w *
b. DSR DA / STS position and by operating test s/w
c. POS
d. W/D position
202. After the display selector switch is moved to the DSR TK / STS position
a. malfunction codes are displayed first
b. action codes are displayed first *
c. both at a time
d. none of the above
203. Action code 01 interpret that
a. partial system is in operative
b. Data is not reasonable
c. Complete system is in operative *
d. failure of computer
204. Failure of computer is interpreted by which code
a. malfunction code No. 03
b. action code No. 01
c. malfunction code No. 04
d. action code No. 02 *
205. Data from automatic data entry unit is not reasonable, this is interpreted by
a. action code 4 b. action code 5 *
c. action code 3 d. action code 2
206. If malfunction is momentary and corresponding logic circuits are reset
a. 'WARN' light remain on
b. 'WARN' light is also estinguished *
207. In an IRS, malfunctions are indicated by
a. Red 'FAULT' light on IRMP
b. Red 'ALERT' light on IRMP
c. AMBER 'FAULT' light on IRMP *
d. Amber 'ALERT' light on IRMP
208. What does IRMP stands for
a. Initial reference mode panel
b. Instrument reference mode panel
c. Inertial reference mode point
d. Inertial reference mode panel *
209. MRCP stands for
a. master control and display panel
b. maintenance control and display panel *
c. mode control and display panel
d. middle control and dual panel
210. EFIS stands for
a. Electronic fuel instrument system
b. Electronic flight indication system
c. Electronic flight instrument system *
d. Electric force instrument system

CHAPTER - 31

ELECTRONIC (CRT) DISPLAY

1. CRT means
 - a. Cathod receiver tube
 - b. Cathod ray tube *
 - c. Command relay tube
 - d. Control relay tube
2. CRT is a
 - a. Electric device
 - b. Mechanical device
 - c. Thermionic device *
 - d. Pnumatic device
3. CRT is a Thermionic device in which electrons are librated as a result of
 - a. Mechanical energy
 - b. Kinetic energy
 - c. Potential energy
 - d. Heat energy *
4. CRT consist of an
 - a. Evacuated brass envelope
 - b. gas filled brass envelope
 - c. evacuated glass envelope *
 - d. gas filled glass envelope
5. Evacuated glass envelop of CRT, contains inside beam focusing, beam deflection system and an
 - a. electron 'missile'
 - b. electric 'gun'
 - c. electron 'rocket'
 - d. electron 'gun' *
6. Inside surface of screen of CRT coated with a crystalline solid material known as
 - a. sulphur
 - b. phospher *
 - c. aluminium
 - d. brass
7. The electron gun of CRT consist of
 - a. indirectly heated cathod and two anodes
 - b. indirectly headed cathod and cylindrical grid
 - c. indirectly heated cathod, a cylindrical grid and two anodes *
 - d. directly heated cathod and two anodes
8. When _____ is heated electrons are liberated and in passing through anodes, they are made to form a beam
 - a. anodes
 - b. cathod *
 - c. grid
 - d. none of the above
9. The grids is maintained at
 - a. positive potential
 - b. neutral
 - c. negative potential *
 - d. high positive potential
10. _____ are at a positive potential with respect to cathod
 - a. grid
 - b. anodes *
 - c. cathod
 - d. all of the above
11. Anodes accelerate the electrons to a _____ until they strike the screen coating
 - a. low velocity
 - b. high velocity *
 - c. high speed
 - d. none of the above
12. Coils are provided around neck of the tube and are configured so that field are produced
 - a. horizontally only
 - b. vertically only
 - c. horizontally and vertically *
 - d. none of the above
13. Electron beam can be deflected to the left or right, up or down depending on the polarities produced by
 - a. anode
 - b. cathod
 - c. class envelop
 - d. coils *
14. Colour CRT displays are used in
 - a. Permanent display unit
 - b. Radio display unit
 - c. Weather radar display unit *
 - d. None of the above
15. The video data received from a radar antenna is conventionally in what is termed
 - a. Alfa form
 - b. Beta form
 - c. Ohm theta form
 - d. Rho theta form *
16. In colour display indicator, the scanning of data is somewhat similar to that adopted in the tube of a television receiver i.e.
 - a. master scanning is horizontal lines
 - b. master scanning is vertical lines
 - c. raster scanning is vertical lines
 - d. raster scanning is horizontal lines *
17. Binary coded data in CRT can represent
 - a. two conditions
 - b. three conditions
 - c. four conditions *
 - d. five conditions
18. Four conditions of binary coded data are green, yellow, red and
 - a. Amber
 - b. white
 - c. black
 - d. blank screen *
19. Green condition of binary coded data of CRT means
 - a. Low returns (lowest rainfall rate)
 - b. Moderate returns (moderate rainfall rate) *
 - c. Strong returns (high density rainfall rate)
 - d. Zero return

20. Yellow condition of binary coded data of CRT means
- Low return (lowest rainfall rate)
 - Moderate return (moderate rainfall rate) *
 - Zero return (low level rainfall rate)
 - Strong return (high density rainfall rate)
21. Red condition of binary coded data of CRT means
- Low return
 - Moderate return
 - Zero return
 - Strong return *
22. Blank screen condition of binary coded data of CRT means
- Zero or low level returns *
 - Low return
 - Moderate return
 - Strong return
23. The screen of CRT is scanned in
- 256 vertical lines
 - 526 horizontal lines
 - 256 horizontal lines *
 - 526 vertical lines
24. The screen is scanned in 256 horizontal lines and there are _____ of information displayed on each line
- 156 bits
 - 256 bits *
 - 526 bits
 - 625 bits
25. Each horizontal line of screen is located by a value of Y and each bit by a value of
- X *
 - Y
 - Z
 - none of the above
26. Screen of CRT has
- 256 + 256 matrix
 - 256 matrix
 - 256 x 256 matrix *
 - 256 - 256 matrix
27. As the screen of CRT is scanned, the memory is addressed at each point on each line by
- 2 counters *
 - 3 counters
 - 4 counters
 - 5 counters
28. For addressing the rows in memory of CRT, which counter is there
- vertical or Y counter
 - vertical or X counter
 - Horizontal or Y counter
 - Horizontal or X counter *
29. For addressing the rows in memory of CRT, which counter is there
- Vertical or Y counter *
 - Vertical or X counter
 - Horizontal or X counter
 - Horizontal or Y counter
30. The 'X' counter is caused to count 'down' i.e.
- Right to left
 - Left to right *
 - Bottom to top
 - Top to bottom
31. The X counter is caused to count down i.e. left to right from the number
- 0 - 186 at the centre of screen
 - 0 - 86 at the centre of screen
 - 86 - 0 at the centre of the screen
 - 186 - 0 at the centre of the screen *
32. When the X counter reaches 0, the divider circuit change to a
- High state out put
 - Moderate out put
 - 'Low' state out put *
 - None of the above
33. When X counter reaches zero, low state out put cause the counter to count upto the
- 28 at the end of line
 - 128 at the end of the line *
 - 86 at the end of the line
 - 186 at the end of the line
34. When X counter reaches 0, divider circuit changes to low state output causing counter to count 128, at which point a 'line blank' pulse of _____
- 14 m S is generated *
 - 16 m S is generated
 - 32 m S is generated
 - 4 m S is generated
35. Line scan time is about
- 16 mS
 - 32 mS
 - 61 mS *
 - 23 mS
36. Total time for each line scan (including blank pulse of 14 MS is
- 126 mS
 - 14 mS
 - 61 mS
 - 75 mS *
37. An output from X counter is applied to Y counter, which counts to
- 56 plus eight counts for a scan blank time
 - 128 plus eight counts for a scan blank time
 - 256 plus eight counts for a scan blank time *
 - 156 plus eight counts for a scan blank time
38. A colour CRT has
- one electron gun
 - two electron guns
 - three electron guns *
 - four electron guns
39. One being bombarded by electron beams, the phosphors luminesce in each of the three primary colours _____
- red, green, yellow
 - red, green, blue *
 - pink, green, yellow
 - black, green, orange
40. The beam from a particular gun must only be able to strike screen elements of one colour and to achieve this a perforated steel sheet is positioned adjacent to coating of screen. The perforated steel sheet is called _____
- blank sheet
 - perforated mask
 - shadow mask *
 - flying mask

41. In alphanumeric displays when datum marks, arcs and cursive symbols are to be displayed, which method of a scanning is adopted
- Raster scanning
 - Stroke pulse method of scanning *
 - Roster scanning
 - Strike scanning
- essential for in flight management
- moving data *
 - fixed data
 - both moving and fixed data
 - none of the above
42. In alphanumeric displays position of each character on screen predetermined and stored in a _____
- Computer
 - Shadow mask
 - Memory matrix *
 - Modular matrix
43. If you want characters to be displayed in blue, which gun should be active in producing them
- Red gun
 - Blue gun *
 - Green gun
 - All the three guns
44. Spacing is necessary
- between individual characters only
 - between rows of characters only
 - between individual characters and between rows of characters *
 - spacing is not necessary
45. The micro processor processes information from
- Data 'highway' bus
 - Memory circuit
 - Data highway bus and memory circuits *
 - Computer
46. After microprocessor signals are generated in the relevant binary format and are supplied to a
- symbol generator unit *
 - computer unit
 - screen
 - symbol transformer unit
47. Generator unit generates and supplies signals to
- Beam deflection of CRT
 - Anode of CRT
 - Screen of CRT
 - Beam deflection and color gun circuits of CRT *
48. Generator unit supplied signals to beam deflection and colour gun circuit of CRT such that its beams are
- Raster scanned only
 - Stroke scanned only
 - Raster and stroke scanned *
 - None of the above
49. Displayed data of CRT is in forms, fixed and moving, which form of data represent as symbols, scale marking names of system, datum mark
- moving data only
 - fixed data only *
 - jumping data only
 - both moving and fixed data
50. Which form of data are in majority and present changes occurring in the measurement of all parameters

n n n

CHAPTER - 32

ELECTRONIC FLIGHT INSTRUMENT SYSTEMS

1. EFIS stands for
 - a. Electrical flight instrumental system
 - b. Electronic fault insulation system
 - c. Engine flight instrumental system
 - d. Electronic flight instrumental system *
2. Each electronic flight instrument system (captain and first officer) consist of two display units
 - a. EHSI and AIDS
 - b. EADI and EHSI *
 - c. EAHF and EHSV
 - d. EADI and ECAM
3. How many servo generators (SGs) are there in Electronic flight data system
 - a. one
 - b. two
 - c. three *
 - d. four
4. In the event of failure of corresponding SGs a third SG is incorporated so that its drive signals may be switched to
 - a. Left display units only
 - b. Right display units only
 - c. Either to left or right display units *
 - d. None of the above
5. What does EHSI stands for in electronic flight instrument system
 - a. Electrical horizontal situation indicator
 - b. Electronic horizontal situation indicator *
 - c. Electronic high speed indicator
 - d. Environmental horizontal situator indicator
6. The main task of processor and associated ROM and RAM memories are to calculate
 - a. Loss factors for three video amplifiers
 - b. Gain factors for three video amplifiers *
 - c. Loss factors for four video amplifiers
 - d. Gain factors for four video amplifiers
7. Three video amplifiers of EFIS are
 - a. Red, blue and yellow
 - b. Blue, green and orange
 - c. Red, green and blue *
 - d. White, black and red
8. Which card take X and Y deflection signals and develop drive signals for 3 radial convergence coil
 - a. Convergence card *
 - b. Comparator card
 - c. Inter connect card
 - d. Amplifier card
9. Signals for the X and Y beam deflections for stroke and raster scanning are provided by the deflection
 - a. amplifier card *
 - b. convergence card
 - c. computer card
 - d. none of the above
10. Which of the following card serves as the interface between the external connector of a display unit and the various cards
 - a. amplifier cards
 - b. convergence card
 - c. interconnect card *
 - d. computer card
11. Digital line receivers for the signals supplied by the SGs are located on
 - a. Amplifier card
 - b. Inter connect card *
 - c. Convergence card
 - d. None of the above
12. Which colour is assigned for ground shading on EADI (failure warning flags, limit and alert annunciators)
 - a. White
 - b. Green
 - c. Red
 - d. Yellow *
13. White colour is assigned for display of
 - a. Sky shading on EADI
 - b. Grand shading on EADI
 - c. Present situation information *
 - d. Heaviest participation levels as detected by the weather
14. Which color is assigned to display of present situation information where contrast with white symbol is required or for data having lower priority than white symbol
 - a. Green *
 - b. Yellow
 - c. Red
 - d. Blue
15. Which colour is assigned to display heaviest precipitation levels as detected by the weather radar
 - a. White
 - b. Green
 - c. Red *
 - d. Yellow
16. _____ provide the analog, discrete and digital signal interfaces between an aircraft's system, the display units and control panel
 - a. EADI
 - b. EHSI
 - c. SGs *
 - d. None of the above
17. Which device responds to flight deck ambient light conditions and automatically adjust the brightness of CRT displays to a comfortable level,
 - a. Remote light sensor (RLS) *
 - b. Ring laser gyroscope sensor (RLG)
 - c. both a. and b.
 - d. None of the above
18. Remote light sensor is a
 - a. Electrodiode device
 - b. Photo diode device *
 - c. Phase diode device
 - d. None of the above

19. _____ displays traditional pitch and roll attitude indications against a raster scanned background
- EHSI
 - RLS
 - EADI *
 - None of the above
20. Function of I/O 1 and 2 card of symbol generator (SG) is to
- Receive input data from main processor and supply to generator
 - Supply input data for use by the main processor *
 - Supply input data to main RAM
 - None of the above
21. Function of main processor card of symbol generator (SG) is
- main data processing and control for the system *
 - Read only memory
 - Supply input data to raster generator
 - All of the above
22. Function of Main RAM card of Symbol Generator (SG) is to
- Read, write memory
 - Address decoding
 - I/O function for the system
 - All of the above *
23. Read only memory for the system is the function of which card of SG
- Main process
 - PROM *
 - Main RAM
 - WXR memory
24. Master transfer bus interface is the function of which card of SG
- Display sequencer
 - Display controller *
 - Display driver
 - None of the above
25. Time scheduling and inter leaving for raster, refresh, input and stand by functions of weather radar input data function is of which card of SG
- WXR input *
 - WXR memory
 - Both a. and b.
 - None of the above
26. Function of WXR memory card of Symbol Generator is
- RAM selection for single input data
 - row and column shifters for rotate / translate system
 - Shift registers for video output
 - All of the above *
27. Which card of Symbol Generator loads data into registers on stroke and raster generator cards
- Display controller
 - Display sequencer *
 - Display driver
 - None of the above
28. The function of which generator card is to generate all signal characters, special symbols, straight and curved lines and arc on display unit
- Raster Generator card
 - Stroke generator card *
 - Symbol Generator card
 - None of the above
29. The function of _____ is to generate master timing signals for raster, stroke, EADI and EHSI functions
- Raster Generator *
 - Stroke Generator
 - Display controller
 - Display sequencer
30. Function of which card of symbol generator is to convert and multiplex x and y digital stroke and raster inputs into analog for driver operation
- WXR memory
 - Display sequencer
 - Display driver *
 - Display controller
31. The EADI has a raster scanned back ground i.e.
- Upper half is in yellow and lower half is red
 - Upper half is in cyan and lower half is in yellow *
 - Upper half is in yellow and lower half is cyan
 - Upper half is white and lower is in blue
32. In EADI upper half is C raster i.e.
- Ground shading
 - Sky shading *
 - Both a. and b.
 - None of the above
33. In EADI lower half is Y raster i.e.
- Ground shading *
 - Sky shading
 - Both and b
 - None of the above
34. Attitude data is provided by an
- RI system
 - RS system
 - IL system
 - IR system *
35. During Automatically controlled approach to land, the auto land status, pitch, roll armed and engaged mods are selected on
- EFIS (Electronic flight instrument system) control Panel
 - EDEP (Flight data entry panel)
 - AFCS (Automatic flight control system) control panel *
 - None of the above
36. Decision height is selected on
- EFIS control panel *
 - AFMC control panel
 - FDE panel
 - None of the above
37. Radio altitude is digitally displayed during an approach and when aircraft is between
- 2500 and 1000 meter above ground level
 - 2500 and 1000 ft above ground level *
 - 250 and 100 ft above ground level
 - None of the above
38. Below 1000 ft of height during landing the display automatically changes to a

- 15 . Compass rose is automatically referenced to true North when latitude
- . Between 73° N and 65° S
 - . Above 73° N and 65° S
 - . Below 73° N and 65° S
 - . None of the above
- 16 . What does VOR stands for
- . Vertical omnidirectional range
 - . Variable omnidirectional range
 - . Very high frequency omnidirectional range
 - . Variation of range
- 16 . What does DME stands for
- . Decision making equipment
 - . Desired mode equipment
 - . Distance measuring equipment
 - . Division making equipment
- 16 . Failure of data signals from ILS and radio altimeter are displayed on each EADI and EHSI in form
- . Green flag . Yellow flags
 - . Blue flag . Red flag
- 16 . Each pilot has a panel of _____ to connect the respective display units to alternate sources of input data
- . Data source selector switch
 - . NAV / TRUE selector switch
 - . Both a. and b.
 - . None of the above
- 16 . Except one rotary type S/W, other switches of source selector S/W panel are
- . Illuminated push type
 - . Illuminated pull type
 - . All are rotary type
 - . None of the above
- 16 . In the normal operating configuration of system, switches of source selector S/W panel remain blank and when activated they illuminate
- . Green . Amber
 - . Yellow . White

CHAPTER - 33

ENGINE INSTRUMENTS

1. How many principal types of engines are in use at the present time
 - a. Two
 - b. Three *
 - c. Four
 - d. Five
2. At the present time there are three principal types of engine in use namely - piston, pure turbine and
 - a. Turbopropeller *
 - b. Turbopopular
 - c. Supper popular
 - d. None of the above
3. Pressure of engine system is measured by Instrument systems which in the majority of applications are of the
 - a. Pilot static type
 - b. Remote indicating type *
 - c. Direct heating type
 - d. None of the above
4. The sensor or transmitter units are connected to pressure source located at remote point and transmit
 - a. Pressure directly to instrument
 - b. Data through electronic device
 - c. Data through electric transmission circuit *
 - d. None of the above
5. Pressure sensor units contain elements, are in the form of
 - a. Matel capsules only
 - b. Diaphragms only
 - c. Bellows only
 - d. Either metal capsules, diaphragm or bellows, depending on perticular design and pressure ranges to be measured *
6. Pressure senser unit, other than metal capsules, diaphragm or bellows, have another form of element, called
 - a. Picture tube
 - b. Bourdon tube *
 - c. Cathode tube
 - d. All of the above
7. The elements of pressure sensor units are _____connected to electrical transmitters
 - a. Electrically
 - b. Physically
 - c. Mechanically *
 - d. None of the above
8. The elements are mechanically connected to electrical transmitter which are of
 - a. Fixed core type of induction device
 - b. Moving core or gyro type of inductive device
 - c. Flexibility core or synchro type of induction device
 - d. Moving core or synchro type of induction device*
9. In Tx synchro transmission system the rotar of Tx is connected via a mechanical quadrant and penion to
 - a. One bellow
 - b. Two bellows *
 - c. Three below
 - d. Four bellows
10. In synchronous transmission type pressure indicating system one bellow is sensitive to oil pressure and other is sensitive to
 - a. Pilot pressure
 - b. Temperature of engine
 - c. Prevailing pressure of ambient air in cowled area of engine *
 - d. None of the above
11. In synchronous transmission type pressure indicating system rotar is positioned so as to produce output signals proportional to
 - a. Sum of two pressure
 - b. The multiple of two pressures
 - c. The difference of two pressures *
 - d. None of the above
12. Gauge pressure is the
 - a. Oil pressure
 - b. Ambient cowl pressure
 - c. Sum of oil pressure and ambient cowl pressure
 - d. Difference of oil pressure and ambient cowl pressure *
13. In the event of failure of electrical power to system the indicator pointer will
 - a. Come to zero
 - b. Remain at the pressure value that was being measured at the time of failure *
 - c. Show the greater reading
 - d. None of the above
14. For oil pressure measurement in servo-operated pressure indicating system, the indicator contains
 - a. Single servo mechanism connected to individual transmitters
 - b. Dual servo mechanism connected to individual transmitters *
 - c. No servo mechanism
 - d. Three servo mechanism
15. Operating pressure range of oil pressure in servo operated pressure indicated system is
 - a. 0 to 50 PSI
 - b. 0 to 75 PSI
 - c. 0 to 200 PSI
 - d. 0 to 100 PSI *
16. Operating pressure range of oil filter inlet pressure in servo operated pressure indicated system is
 - a. 0 - 100 PSI
 - b. 0 - 200 PSI *
 - c. 0 - 300 PSI
 - d. 0 - 400 PSI

17. In servo operated pressure indicating system, mechanism connected to oil pressure transmitter drives a
- Single pointer
 - Double pointer *
 - Triple pointer
 - No pointer
18. Fixed outer scale (0 - 200 PSI) gives the readings of
- Oil filter inlet pressure *
 - Oil system pressure
 - Oil temperature
 - None of the above
19. In servo operated pressure indicating system pressures are applied to
- Bourden tube
 - Pilot tube
 - Capsules *
 - None of the above
20. Inner scale of indicator which is marked (0 - 100) in servo operated pressure indicated system indicate the pressure of
- Oil system pressure *
 - Oil filter inlet pressure
 - Oil temperature
 - None of the above
21. In servo operated pressure indicating system, the indicator is provided with
- Coil operated flag
 - Solenoid operated flag *
 - Pressure operated flag
 - None of the above
22. A solenoid operated flag comes into operation whenever there is a failure of
- 115 V ac power supply is system
 - 28 V DC power supply to system
 - 26 V DC power supply to system
 - 26 v ac power supply to the system *
23. Most substances expand as their
- Temperature rises *
 - Temperature decreases
 - temperature remain constant
 - None of the above
24. When subjected to a temperature rise many liquid experience such motion of their molecules that there is a change of state from
- Liquid to solid
 - Liquid to vapour *
 - Both a. and b.
 - None of the above
25. Dissimilar metals when joined at their ends produce an
- Electromotive force *
 - Megneto motive force
 - Contrifugal force
 - Centripital force
26. The radiation emitted by any body at any wave length is function of the temperature of the body is termed its
- Sensitivity
 - Permeability
 - Emissivity *
 - Elasticity
27. If the radiation is measured and the emissivity is known, the temperature of body can be determined, such a measuring technique is known as
- Convention pyrometry
 - Radiation pyrometry *
 - Radiation Geometry
 - Conduction Pyrometry
28. Thermo emf system depends for their operation on
- Electrical energy *
 - Mechanical energy
 - Chemical energy
 - None of the above
29. Thermo emf system depends for their operation on electrical energy which produced by the direct conversion of
- Mechanical energy
 - Chemical energy
 - Kinetic energy
 - Heat energy *
30. Thermo emf system are
- Dependent of external electrical supply
 - Independent of external electrical supply *
 - Like variable resistance system in terms of electrical supply
 - None of the above
31. The form of energy conversion (Heat energy to electrical energy) is known as
- Look back effect
 - See back effect *
 - Thermal effect
 - None of the above
32. In thermocouple, the junction at the higher temperature is termed as
- Hot junction *
 - Cold junction
 - Warm junction
 - None of the above
33. In thermocouple, the junction at lower temperature is termed as
- Warm junction
 - Hot junction
 - Cold junction *
 - None of the above
34. The hot junction is also called as
- Reference junction
 - Cold junction
 - Thermal junction
 - Measuring junction *
35. The cold junction is also known as
- Reference junction *
 - Measuring junction
 - Hot junction
 - None of the above
36. The materials selected for use as thermocouple sensors fall into
- Two main groups *
 - Three main groups
 - Four main groups
 - Five main groups
37. The two main groups of thermocouple material are
- Earth metal and rare metal
 - Rare metal and hot metal
 - Base metal and rare metal *
 - Base metal and earth metal
38. In the basic form of thermocouple system, measurement is accomplished by connecting a moving coil

- millivoltmeter calibrated in
- Degree ferenheight
 - Degree Celsius *
 - Degree kelvin
 - None of the above
- The surface contact type of thermocouple sensor is designed to measure the temperature of a
 - Liquid component
 - Gas component
 - Solid component *
 - All of the above
 - The immersion type thermocouple sensor is designed to measure
 - Solid component temperature
 - Gas temperature *
 - Liquid temperature
 - All of the above
 - The surface contact type thermocouple is used in
 - Air cool engine cylinder head temperature indicating system *
 - Turbine engine exhaust gas temperature indicating system
 - Both a. and b.
 - None of the above
 - The immersion or probe type of thermocouple is used in
 - Air cooled cylinder head temperature indication system
 - Turbine engine exhaust gas temperature indicating system *
 - Both a. and b.
 - None of the above
 - What does EGT stands for in Engine Instruments
 - Exhaust gas temperature *
 - Excessive gas temperature
 - Extra gas temperature
 - Exhaust gas thermometer
 - CHT stands for in engine instruments
 - Cylinder Head Thrust
 - Carbon Head Temperature
 - Cylinder Head Temperature *
 - Cylinder High Temperature
 - In surface type thermo couple, used for CHT measurement, the material combination used are
 - Aluminium / chomel
 - Copper / constantan *
 - Platinum / Rhodium - Platinum
 - None of the above
 - Material combination of immersion type thermocouple which is used in EGT is
 - Copper / constantan
 - Iron / constantan
 - Chomel / Alumel *
 - Platinum / Rhodium - Platinum
 - Which material combination of the thermocouple is not utilized in aircraft temperature indicating system
 - Copper / constantan
 - Iron / constantan
 - Chomel / Alumil
 - Platinum / Rhodium - Platinum *
 - In constantan what is the percentage of NI and CU
 - Ni 30% cu 70%
 - Ni 40% cu 60% *
 - Ni 60% cu 40%
 - Ni 70% cu 30%
 - Metal chomel used in thermocouple what is the percentage of Ni and cr
 - cr 20% Ni 80%
 - Ni 90% cu 10%
 - Ni 90% cr 10% *
 - Ni 10% cr 90%
 - In base metal thermocouple (surface contact), which wire is positive and which wire is negative
 - Copper (cu) positive, constantan negative *
 - Copper negative, constantan positive
 - Both copper and constantan are positive
 - Both copper and constantan are negative

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CHAPTER - 34

FUEL QUANTITY INDICATING SYSTEMS

1. Which of the following units - fuel quantity indicating system does not consists of
 - a. Fuel tank
 - b. Amplifier
 - c. Indicator
 - d. Thermocouple *
2. Fuel quantity indicating system consist of a _____ located in a fuel tank
 - a. Fixed capacitance
 - b. Variable capacitance *
 - c. Fixed resistance
 - d. None of the above
3. Whenever a potential difference is applied across two conducting surfaces separated by a non conducting medium, they have the property of string an electric charge. This property is known as
 - a. Resistance
 - b. Inductance
 - c. Capacitance *
 - d. None of the above
4. A potential difference is applied across two conductors, separated by a non conducting medium. This medium is called
 - a. Dielectric *
 - b. Electric
 - c. Trielectric
 - d. None of the above
5. The device comprising the surfaces, or plates and a dielectric is called a
 - a. Resister
 - b. Capacitor *
 - c. Regulator
 - d. None of the above
6. The dielectric contains
 - a. Free electrons
 - b. No free electrons *
 - c. Many electrons
 - d. None of the above
7. The capacitance is expressed in
 - a. Newtons
 - b. Ampere
 - c. Farads *
 - d. Joule
8. One farad representing the ability of a capacitor to hold a charge of one coulomb, which raises the PD between its plates by
 - a. 1 ohm
 - b. 1 volt *
 - c. 2 ohms
 - d. 2 volts
9. 1 coulomb means
 - a. 6.24×10^{28} electrons
 - b. 4.26×10^{18} electrons
 - c. 4.26×10^{28} electrons
 - d. 6.24×10^{18} electrons *
10. 1 microfarad
 - a. 10^6 F
 - b. 10^5 F
 - c. 10^{-6} f *
 - d. 10^{-5} F
11. In the application of the capacitor principle to a fuel quantity indicating system _____ is the standard unit of measurement
 - a. Farad
 - b. Microfarad
 - c. Picofarad *
 - d. None of the above
12. 1 pu (1 picofarad. =
 - a. 10^{-6} F
 - b. 10^{-8} F
 - c. 10^{-10} F
 - d. 10^{-12} F *
13. Capacitance depends upon the following factors
 - a. Area a. of the plates
 - b. Distance (d. between the plates
 - c. Capacitance (or absolute permittivity) E of an unit cube of the dielectrical material
 - d. All of the above are correct *
14. Permittivity E is usually quoted as being relative to that of a _____
 - a. Pressure
 - b. Volume
 - c. Vacuum *
 - d. None of the above
15. Relative permittivity, is also called
 - a. Dielectric constant *
 - b. Dielectric resistance
 - c. Diamagnetic constant
 - d. None of the above
16. Relative permittivity which is also called dielectric constant is denoted by a letter
 - a. L
 - b. M
 - c. R
 - d. K *
17. The relative permittivity of air is
 - a. 1.000 *
 - b. 10.00
 - c. .001
 - d. .0001
18. Which substance have the highest permittivity in following
 - a. Air
 - b. Water *
 - c. Water vapour
 - d. Aviation kerosene
19. The relative permittivity of water is
 - a. 100
 - b. 1.000
 - c. 18.07
 - d. 81.07 *
20. 1.95 is the relative permittivity of
 - a. Aviation kerosene
 - b. Aviation gasoline *
 - c. Water
 - d. Water vapour
21. The relative permittivity of Aviation kerosene is
 - a. 81.07
 - b. 1.95
 - c. 2.10 *
 - d. 1.12
22. The relative permittivity of water vapour is
 - a. 1.000
 - b. 1.007 *
 - c. 2.10
 - d. 1.95

23. When DC is applied to a capacitor there is, apart from the initial charging current, _____
 a. Current flow through the capacitor
 b. No current flow through the capacitor *
 c. Both a. and b. are correct
 d. None of the above
24. With change in temperature
 a. The volume of fuel is affected
 b. The density of the fuel is affected
 c. The relative permittivity of fuel is affected
 d. All the above are correct *
25. Capacitance depends upon the
 a. Type of material of the dielectric
 b. Area of the plates
 c. Both a. and b. are correct *
 d. Both a. and b. are not correct
26. Amplifier of fuel system has two stages
 a. For amplifying the signal
 b. For discriminating the phase of signal
 c. Both a. and b. are correct *
 d. None of the above
27. In a fuel tank, initially at constant Full Tank level, the bridge is
 a. Unbalance and signal is produced
 b. Balance and no signal is produced *
 c. Balance and high value of signals are produced
 d. Unbalance and no signal is produced
28. As the fuel level drops in fuel tank, the capacitance of probe
 a. Decreases * b. Increases
 c. Remain unaffected d. None of the above
29. As the fuel level drops in fuel tank, the capacity of probe decreases and bridge gets
 a. Balanced
 b. Unbalanced *
 c. No effect on bridge conditions
 d. None of the above
30. Densitometer, installed in each fuel tank is comprised two principal units, one is emitter and other is
 a. Electric unit b. Electronic unit *
 c. Mechanical unit d. None of the above
31. Emitter of densitometer in fuel quantity indicating system contains
 a. Collimator
 b. A radio activate capsule
 c. a microswitch
 d. All of the above *
32. An electronic unit of densitometer in fuel quantity indicating system contains
 a. One detector tube b. Two detector tubes *
 c. Three detector tubes d. Four detector tubes
33. The detector tubes of an emitter of densitometer is filled with
 a. Carbondioxide gas b. Oxygen gas
 c. Nitrogen gas d. Xenon gas *
34. An emitter of densitometer contains
 a. Two detector tubes
 b. Signal processor
 c. Power supply circuit card modules
 d. All of the above *
35. Complete unit of densitometer is installed on rear spar of an integral tank such that the emitter is on the
 a. inside of the tank *
 b. outside of the tank
 c. centre of the tank
 d. none of the above
36. In densitometer, _____ radiation from the emitter passes through the collimator and the fuel.
 a. Alpha b. Beta
 c. Gama * d. Delta
37. Each tube of electronics unit in fuel quantity indicating system is supplied with
 a. 420 VDC b. 1420 VDC *
 c. 2420 VDC d. 1420 V AC
38. Probe utilize tube made of aluminium suitable protected against the
 a. Corrosion b. Short circuiting
 c. Grounding d. All of the above *
39. Outer tube of tank probes in fuel system are generally made of
 a. Aluminium * b. Iron
 c. Platinum d. None of the above
40. The inner tube of tank probe is a
 a. Non - conducting wood
 b. Non - conducting aluminium
 c. Non - conducting plastic material *
 d. Non - conducting iron material
41. The inner tube is a non-conductive plastic material that is coated with a metalised film on its outer surface to serve as a
 a. Resistance plate b. Capacitor plate
 c. Inductor plate * d. None of the above
42. Compensator probe has
 a. One tube b. Two tubes *
 c. Three tubes d. Four tubes
43. For calibration of probe
 a. Turning plate is provided
 b. 'Tuning' plate is provided *
 c. Tilting plate is provided
 d. None of the above

44. A turning is provided for calibration of the probe and also for controlling
- Capacitance firing
 - Resistance fringing
 - Capacitance fringing *
 - None of the above
45. In compensator type probe, which statement is correct
- Outer and inner tubes are of high impedance and middle of low impedance
 - Outer and inner tubes are of low impedance and middle of high impedance *
 - Outer and centre tubes are of high impedance
 - Inner and centre tubes are of low impedance
46. Tank probes are positioned within the fuel tanks and are connected in
- Parallel *
 - Series
 - Both a. and b.
 - None of the above
47. If a failure of signal flow occurs, indicator pointer slowly downwards to the
- Full position
 - Zero position
 - Empty position *
 - None of the above
48. When the S/W is held in 'TEST' position pointer is driven towards
- Full position
 - Zero *
 - Empty
 - None of the above
49. When the TEST S/W is held in TEST position, the pointer is driven towards zero,
- If the circuit is functioning correctly *
 - If the circuit is not functioning correctly
 - In both the case a. and b.
 - None of the above
50. When the test S/W is released, the pointer
- Should remain at zero
 - Should return to its original indication *
 - Should indicate full reading
 - None of the above
51. Totaliser indicators are provided in some aircraft in addition to normal
- Flight director systems
 - Flight management system
 - Fuel quantity indicating system *
 - None of the above
52. Totaliser indicator shows
- Total quantity of fuel remaining
 - Aircraft's gross weight
 - Only a is correct
 - Both a. and b. are correct *
53. When fuel is consumed, the gross weight counter of totaliser indicator continuously indicate
- An increasing gross weight
 - A decreasing gross weight *
 - An increasing fuel quantity
 - None of the above
54. Which fuel system automatically terminates refueling at a pre set fuel level
- VTO *
 - VOR
 - VBU
 - VGU
55. What does VTO stands for in fuel system
- Volumetric take - off
 - Volumetric top - off *
 - Vertical take - off
 - Vertical top - off
56. The indicator lights on refueling panels are normally
- Green
 - Red
 - Amber
 - Blue *
57. The indicator light on refueling panel, normally illuminates when the valves are in
- Close position
 - Open position *
 - Both a. and b.
 - None of the above
58. If only partial load of fuel is required, the indicators are monitored and when desired quantity has been uplifted, the refueling valves are closed
- By selecting this position of the appropriate S/W*
 - Automatically by VTD
 - Both a. and b. are correct
 - None of the above
59. When a full load of fuel is required and filled, the refueling valves are
- Automatically closed by VTO system *
 - To be closed by selecting this position of a appropriate switch
 - Automatically closed by VOR system
 - None of the above
60. The primary indication of weight is given by LCD indicators in
- Electrical signal format
 - Mechanical signal format
 - Digital signal format *
 - None of the above

CHAPTER - 35

ENGINE POWER AND CONTROL INSTRUMENTS

1. The power of engine refers to the amount of
 - a. Weight available for production
 - b. Drag available for propulsion
 - c. Thrust available for propulsion *
 - d. None of the above
2. Engine speed is measured in terms of
 - a. ~ km / hr
 - b. - Knots
 - c. -RVM
 - d. RPM *
3. RPM of engine means, engine speed in terms of
 - a. Regulation per minute
 - b. Revolution per minute *
 - c. Rating per minute
 - d. All of the above
4. In RPM indicating system, Tachometer Generator is of
 - a. AC type *
 - b. DC type
 - c. Pulsating DC type
 - d. None of the above
5. Rotar of Techno Generator may be of
 - a. Two Pole construction
 - b. Four Pole construction
 - c. Either two pole or four pole construction *
 - d. None of the above
6. In order to limit the mechanical loads on Techno Generator, the operating speed of rotar is reduced by means of
 - a. 3:1 ratio gear in the engine drive system
 - b. 4:1 or 2:1 ratio gears in the engine drive system *
 - c. 3:1 or 1:1 ratio gears in the engine drive system
 - d. None of the above
7. Two or four pole type techo generators are utilized in conjunction with a
 - a. Single phase synchronous motor
 - b. Two phase synchronous motor
 - c. Three phase synchronous motor *
 - d. None of the above
8. EGT stands for _____ (with reference to engine system)
 - a. Engine Gear Train
 - b. Exhaust Gas Temperature
 - c. Exhaust Gas Thermometer *
 - d. Excess Gas Temperature
9. A RPM indicator has following inter connected elements
 - a. Driving elements
 - b. Speed indicating element
 - c. Driving element and speed indicating element *
 - d. None of the above
10. The driving element of RPM indicator is a
 - a. Synchronous motor having delta connected single phase stator winding
 - b. Synchronous motor having star connected three phase stator winding *
 - c. Induction motor having star connected single phase stator winding
 - d. Induction motor having star connected two phase stator winding
11. Speed indicating element of indicator consists of
 - a. Temporary magnet device
 - b. An electronic device
 - c. Permanent magnet device *
 - d. None of the above
12. Speed indicating element of indicator consist of a permanent magnet device which operates on
 - a. Eddy current drag principle *
 - b. Eddy voltage drag principle
 - c. Thermocouple principle
 - d. None of the above
13. Permanent magnet device of an indicator may utilize
 - a. A drag cup only
 - b. A drag disc only
 - c. A drug cup or drag disc *
 - d. None of the above
14. The drag cup is mounted on a shaft and is supported such a way that it fits over the magnet rotar
 - a. To increase the airgap to maximum
 - b. To reduce the airgap to minimum *
 - c. Either a. or b.
 - d. None of the above
15. As the technogenerator rotar is driven around inside the stator , three waves or phases of emf are generated, the waves being
 - a. 90° apart
 - b. 180° apart
 - c. 60° apart
 - d. 120° apart *
16. The magnitudes of the emf induced depends on the
 - a. Strength of the magnet
 - b. Number of turns comprising the phase coil
 - c. Both a. and b.*
 - d. None of the above
17. There is always a tendency to oppose the creation of induced current, refers to
 - a. Ohm's law
 - b. Lenz's law *
 - c. Kirchoff's law
 - d. Newton's law

18. Techo probes are made of
 a. Iron b. Copper
 c. Stainless steel * d. None of the above
19. The stainless steel, hermetically sealed probe comprise
 a. A permanent magnet b. A pole piece
 c. No. of coils d. All of the above *
20. The coils of techo probe are of
 a. Cupro - nickel
 b. Nickel - chromium
 c. Cupro - nickel or nickel chromium *
 d. Nickel - Iron
21. Manifold pressure indicators are colloquially termed
 a. Best gauges b. Boost gauges *
 c. Broad gauges d. None of the above
22. Manifold pressure indicators are calibrated to measure absolute pressure in
 a. Inches H₂ O
 b. Milibars
 c. Milimeters Hg
 d. Inches of Hg (mercury) *
23. Manifold pressure gauge, measure absolute pressure. Such pressure being representative of that produced at the induction manifold of a
 a. Unsuper charged piston engine
 b. Super charged piston engine *
 c. Turbine engine
 d. Turbo prop Engine
24. The power output of an internal combustion engine depends on the density of the combustible mixture of
 a. Fuel and oil b. Fuel and water
 c. Water and air d. Fuel and air *
25. Standard sea level pressure is
 a. 12.7 lbf/in² b. 14.7 lbf/in² *
 c. 2 lbf/in² d. 24.7 lbf/in²
26. The process of increasing pressure and charge density is known as
 a. Under charging b. Over charging
 c. Super charging * d. None of the above
27. The measurement of exhaust gas temperature is based on the
 a. Thermo emf principle *
 b. Burden tube principle
 c. Limit switch
 d. None of the above
28. The measurement of EGT is based on the thermo emf principle and requires the use of
 a. Copper / Constantan thermocouple probes
 b. Platinum / Rhodium thermocouple probes
 c. Iron / Constantan thermocouple probes
 d. Chromel / Alumel thermocouple probes *
29. Probes are generally classified as
 a. Stagnation and state response
 b. Stagnation and rapid response *
 c. Stantaneous and rapid response
 d. Instrument and rapid response
30. In pure jet engines
 a. The gas velocities are high
 b. The gas velocities are low *
 c. Gas velocity are moderate
 d. None of the above
31. The application of thermocouple probes depends upon
 a. Volume of the gases b. Velocity of the gases *
 c. Both a. and b. d. None of the above
32. In pure Jet engine, _____ type of probes are employed
 a. Rapid b. Regular
 c. Stagnation * d. None of the above
33. The gas entry and exit holes are usually called
 a. Static holes b. Sampling holes *
 c. Stapling holes d. Pitot holes
34. The entry and exit holes are
 a. Staggered and of unequal size *
 b. Blocked
 c. Staggered and of equal size
 d. None of the above
35. The gas entry and exit holes are uneven, this slow up the gases and causing them to stagnate at
 a. Cold junction b. Hot junction *
 c. Both a. and b. d. None of the above
36. Rapid response thermocouple probes are normally adopted in the EGT system
 a. Unsupercharged piston engine
 b. Supercharged piston engine
 c. Turbopop engine *
 d. None of the above
37. Which type of thermocouple probes are generally adopted in EGT system
 a. Stagnate type b. Rapid response type *
 c. Both a. and b. d. None of the above
38. Rapid response thermocouple probes are normally adopted in EGT system since their
 a. Exhaust gas velocities are lower *
 b. Exhaust gas velocities are higher
 c. Both a. and b.
 d. None of the above
39. Thermocouple probes may also be designed to contain
 a. Double hot junctions
 b. Triple hot junctions
 c. In some cases upto eight hot junctions
 d. All the above are correct *

40. When the hot junctions of immersion type probes are in contact with gas stream, the stream
- Velocity will be reduced *
 - Velocity will be increased
 - Velocity will be unchanged
 - Velocity will be zero
41. When the hot junctions of immersion type probes are in contact with gas stream, the gas will be compress by the expenditure of
- mechanical energy
 - Chemical energy
 - Kinetic energy *
 - Potential energy
42. A measuring system always consists of a group of thermocouple probes connected in
- Series
 - Parallel *
 - Both a. and b.
 - None of the above
43. Terminal studs of junction boxes (for EGT measurement) are made of
- Copper / Constantan
 - Iron / Constantan
 - Platinum / Rhodium Platinum
 - Chromel / Alumel *
44. The diameter of
- Alumel studs and chromel studs is same
 - Chromel studs are larger than those of Alumel studs
 - Alumel studs are larger than those of chromel studs*
 - None of the above
45. The output from the thermocouple probe is supplied first to
- Hot junction reference bridge circuit
 - Cold junction reference bridge circuit *
 - Engine
 - None of the above
46. The output from thermocouple probes is supplied first to cold junction reference bridge circuit, the purpose of which is to compensate for changes in
- Ambient pressure of indicator
 - Ambient temperature of indicator *
 - Absolute pressure of indicator
 - None of the above
47. Bridge circuit is supplied with
- 7VDC *
 - 7 V AC
 - 17VDC
 - 17 V A/C
48. The bridge circuit of EGT gauge is supplied 7 VDC from
- Battery
 - Technogenerator
 - A stabilised reference supply module within the indicator *
 - None of the above
49. The bridge circuit output is supplied to
- Thermocouple
 - A servo amplifier *
- c. Gyro unit
- d. None of the above
50. Exhaust gas temperature indicator is supplied with
- 24 V AC
 - 24 VDC
 - 115 V AC *
 - 115 VDC
51. A solenoid controlled warning flag which appears across the digital counter will appear in event of 115 V AC supply to the indicator falling below
- 50V
 - 100 V *
 - 110V
 - 115V
52. An over power warning light incorporated in the EGT indicator and is controlled by
- A relay
 - A comparator
 - A solid switching circuit
 - All of the above *
53. EGT indicator has a
- Under - temperature warning light
 - Over - pressure warning light
 - Over - temperature warning light *
 - All of the above
54. EPR (Engine pressure ratio) is an operating variable which provides an indication of
- Thrust out put of turboprop engine
 - Thrust out put of unsuper charged piston engine
 - Thrust output of super charged piston engine
 - Thrust output of turbine engine *
55. Thrust output of turbine engine is indicated by
- Torquemeter
 - Fuel flow meter
 - Engine pressure ratio *
 - Manifold pressure
56. EPR (Engine pressure ratio) involves the measurement of Ratio between the pressures at
- Compressor intake and turbine outlet or exhaust *
 - Compressor intake and indicator
 - Both a. and b.
 - None of the above
57. Engine pressure ratio measuring system consist of
- An engine inlet pressure probe
 - A number of pressure sensity probe
 - A pressure ratio transmitter and indicator
 - All of the above *
58. The inlet pressure sensing probe of EPR is mounted
- In cockpit
 - So that it does not face into the airstream in the engine
 - So that it faces into the airstream in engine intake or in the vicinity of air intake *
 - None of the above
59. The inlet pressure sensing probe is protected against icing by

- a. An electrical supply
b. Chemical reaction
c. A supply of warm air from engine anti ice system *
d. None of the above
60. Transmitters of fuel flow measuring systems are connected
a. With indicator in cockpit
b. In engine and immersed in the gas stream of energy
c. In parallel with RPM gauge
d. In delivery lines of an engine fuel system *
61. Transmitters of fuel flow measuring systems are essential
a. Electrical devices
b. Electronic devices
c. Electro-mechanical devices *
d. Electro-chemical devices
62. In fuel flow measuring system, the transmitters provide output signals proportional to flow rate which is basic system in indicated in
a. Volumetric unit b. Mass units
c. Either a. or b.* d. None of the above
63. LVDT stands for
a. Low voltage dual transformer
b. Linear voltage differential (also displacement) transformer *
c. Low value differential transformer
d. Linear value digital transformer
64. Integrated flow meter system is in which a fuel consumed measuring element is combined with that of
a. A/C weight b. Fuel temperature
c. Fuel flow * d. Remaining fuel
65. The transmitter of integrated flow meter system, comprises an impeller driven by a
a. Single phase ac motor
b. Two phase ac motor *
c. Three phase ac motor
d. Single phase DC motor
66. The fuel consumed indicator of integrated flowmeter system is a
a. Optical counter b. Mechanical counter
c. Digital counter * d. None of the above
67. Integrated flow meter system is supplied with
a. 24 VDC
b. 115 V three phase 200 Hz ac
c. 24 V AC
d. 115 V single phase 400 Hz ac *
68. Power supply unit of integrated flowmeter system contains a temperature stable oscillator connected to a voltage frequency converter which converts the main supply into a
a. Two phase 40 V 8 Hz output
b. Three phase 60 V Hz output
c. Single phase 115 V 10 Hz output
d. Two phase 60V 8 Hz output *
69. The transmitter of electronic integrated flow meter system has
a. One electromagnetic pick off element
b. Two electromagnetic pick off element *
c. Three electromagnetic pick off element
d. Four electromagnetic pick off element
70. Transmitter of electronic integrated flowmeter system consist of
a. Cast iron body b. Heavy alloy body
c. Light alloy body * d. Brass body
71. The transmitter of electronic integrated flowmeter system consists of
a. A light alloy body
b. A motor driven impeller assembly
c. externally mounted coils of pick off elements
d. All of the above *
72. The power supply section of electronic unit consists of
a. A transformer
b. A crystal oscillator
c. Power amplifier units
d. All of the above *
73. The purpose of inhibitor of electronic unit (integrated flow meter system) is
a. To suppress the all transmitter signals below a certain flow rate *
b. To control or gate the pulse signals from oscillator
c. To produce output signals proportion true flow rate
d. None of the above
74. The purpose of gate of electric unit in electronic flow meter system is
a. To produce output signals proportional to true flow rate
b. To suppress the all transmitter signals below a ceratin flow rate
c. To control or gate the pulse signals from power supply oscillator *
d. None of the above
75. Which stage of the electronic unit suppress the all transmitter signals below a certain flow rate
a. Gate b. Inhibitor *
c. Divider d. Magnetic
76. Which stage of the electronic unit of intergrated flowmeter system control the pulse signals from power supply oscillator
a. Gate * b. Divider
c. Inhibitor d. None of the above
77. Which stage of the electronic unit of flow meter system provide the time dividing factor

- a. Gate b. Inhibitor
c. Divider * d. None of the above
86. An amber flow meter indicator light is supplied with
a. AC b. DC *
c. Both AC and DC d. None of the above
78. Power supply unit of electronic unit flow meter consists of the following
a. Transformer
b. generator
c. Crystal oscillator
d. Only a. and c. are correct *
87. Which of the following is the unit of power of the engine
a. Brake or shaft horse power *
b. Knots
c. Newton
d. Kelvin
79. Signal comparator of electronic unit (electronic integrated flow meter system) is
a. To provide an operating signal to indicator
b. To compare transmitter output signals with time base signals *
c. To combine the comparators output
d. None of the above
88. Bhp is the unit of power of engine which means
a. Big horse power
b. Brake hertz power
c. Brake horse power *
d. Before hundred percent
80. The function of modulator of electronic unit of flow meter system is
a. To combine the comparator output with 400 Hz ac and produce a new output *
b. To provide an operative signal to indicator servo motor control winding
c. To compare transmitter output signals with time base signal
d. None of the above
89. What does TGT stands for in relative to engine instrument
a. True gas temperature
b. Turbine gas temperature *
c. Turbine great thermometer
d. Turbine gyro temperature
81. The function of servo amplifier of electronic unit of flow meter system
a. To combine the comparator output with 400 Hz ac and produce a new output
b. To provide an operative signal to indicator servo motor control winding *
c. To compare transmitter output signals with time base signal
d. None of the above
90. In turbine engine, if turbine blade cracks
a. Engine vibration will be lowest
b. No effect on engine vibration
c. Engine vibrations will be higher *
d. None of the above
82. The indicator of electronic intergrated flow meter system consists of
a. An ac servo meter which drives a pointer
b. A digital center display
c. A potentiometer wiper through a reduction gear train
d. All of the above *
83. The potentiometer of electronic integrated flow meter indicator is supplied with
a. AC b. DC *
c. Either AC or DC d. None of the above
84. With turbine engines, engine vibration
a. Can be eliminated entirely
b. Are eliminated entirely
c. Can not be eliminated entirely *
d. None of the above
85. _____ indicator light comes 'on' when a maximum amplitude of engine vibration exceeds the pre set value
a. Green b. White
c. Yellow d. Amber *

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CHAPTER - 36

ELECTRONIC INSTRUMENTS FOR ENGINE & A/F SYSTEM CONTROL

1. EICAS stands for
 - a. Engine instruments and centralised airframe system
 - b. Engine indicating and crew alerting system *
 - c. Engine indicating and civil aircraft system
 - d. Electronic instrument and crew alerting service
2. ECAM stands for
 - a. Engine control and maintenance
 - b. Engine centralised monitoring
 - c. Electronic centralised aircraft monitoring *
 - d. None of the above
3. Basic system of EICAS has a control panel and
 - a. One computer
 - b. Two computers *
 - c. Three computers
 - d. Four computers
4. Only one computer of EICAS is in control at a time other is stand by and in the event of failure it may be switched in
 - a. Manually only
 - b. Automatically only
 - c. Either manually or automatically *
 - d. None of the above
5. EFIS stands for
 - a. Engine failure indication system
 - b. Electronic flight instrument system *
 - c. Electrically false indicating system
 - d. None of the above
6. Primary engine Parameters are / is ____
 - a. N_1 speed
 - b. EGT
 - c. Warning and caution messages
 - d. All of the above *
7. Secondary engine Parameters are / is ____
 - a. N_2 speed
 - b. Fuel flow and oil quantity
 - c. Pressure and temperature
 - d. All of the above *
8. Upper display unit of EICAS, displays
 - a. Primary engine Parameters *
 - b. Secondary engine Parameters
 - c. Either a. or b.
 - d. Both a. and b.
9. The lower display unit of EICAS, displays
 - a. Primary engine Parameters
 - b. Secondary engine Parameters *
 - c. Either a. or b.
 - d. Both a. and b.
10. How many colours are produced by CRT
 - a. Six
 - b. Seven *
 - c. Eight
 - d. Nine
11. White colour produced by CRT is used for
 - a. All scales
 - b. Normal operating range of pointers
 - c. Digital read outs
 - d. All of the above *
12. Which colour is used for maximum operating limit marks on scales in EICAS
 - a. Green
 - b. Blue
 - c. Red *
 - d. Yellow
13. Which colour is used for warning messages in EICAS
 - a. Yellow
 - b. Red *
 - c. Yellow
 - d. White
14. For thrust mode read out and selected EPR / N_1 speed marks or target curves which colour is used in EICAS
 - a. Green *
 - b. Blue
 - c. Red
 - d. White
15. Blue colour is used in EICAS for ____
 - a. Caution and advisory messages
 - b. Testing of systems only *
 - c. For a. and b. both
 - d. None of the above
16. Which colour is used for caution and advisory messages on EICAS
 - a. Blue
 - b. White
 - c. Yellow *
 - d. Red
17. In EICAS Magenta colour is used as
 - a. Caution and advisory messages
 - b. Normal operating range of pointers
 - c. Warning messages
 - d. During in flight engine starting and for cross bleed message *
18. In EICAS which of the following colour is used . Names of all parameters being measured (e.g. N_1 , oil, TAT etc. and status marks ____
 - a. Green
 - b. Blue
 - c. Cyan *
 - d. Yellow
19. EICAS is designed to categorise displays and alerts according to function and usage. For this purpose there are
 - a. Two modes
 - b. Three modes *
 - c. Four modes
 - d. Five modes

20. There are three modes of displaying information by EICAS, i.e. operational mode, status mode and
 a. Display mode b. Gyro mode
 c. Maintenance mode * d. Repair mode
21. Which of the following modes of displaying information is not there in EICAS
 a. Maintenance mode b. Repair mode *
 c. Operational mode d. Status mode
22. Which of the following mode of EICAS displays the engine operating information and any alert required to be actioned by the crew in flight
 a. Maintenance modes b. Status mode
 c. Repair mode d. Operational mode *
23. When status mode is selected in EICAS, it displays ___
 a. Data to determine the dispatch readiness of an aircraft *
 b. The engine operating information
 c. Information for trouble shooting
 d. None of the above
24. Which mode of EICAS provides maintenance engineers with information in five different display format to aid them in trouble shooting
 a. Operational mode b. Status mode
 c. Repair mode d. Maintenance mode *
25. What does TAT stands for
 a. True air temperature
 b. Total air temperature *
 c. Technical air temperature
 d. Top air temperature
26. Display select panel permits control of EICAS functions and display and can be used
 a. In flight only b. On ground only
 c. Both a. and b.* d. None of the above
27. Display select panel permits control EICAS function and is normally located on the ___
 a. Left pedestal of an aircraft's flight deck
 b. Right pedestal of an aircraft's flight deck
 c. Centre pedestal of an aircraft's flight deck *
 d. None of the above
28. Engine display switch of EICAS display select panel is of
 a. Momentary pull type b. Momentary push type*
 c. Rotating type d. None of the above
29. Engine display switch of EICAS display select panel is for removing or presenting the display of
 a. Primary information
 b. Secondary information *
 c. Both a. and b.
 d. None of the above
30. Engine display switch of EICAS display select panel is for removing or presenting the display of secondary information on the
 a. Central display unit b. Upper display unit
 c. Lower display unit * d. None of the above
31. Status display switch of EICAS display select panel is of
 a. Momentary push type *
 b. Momentary pulling type
 c. Rotating type
 d. None of the above
32. EICAS status display switch is used to display the status mode information referred to earlier, on the ___
 a. Lower display unit *
 b. Upper display unit
 c. Central display unit
 d. None of the above
33. EICAS status display switch is used to display the status mode information referred to earlier. The display is known as a
 a. 'Front page' b. 'Back page'
 c. 'Status page' * d. 'Standard page'
34. EICAS event record switch is of the
 a. Rotating type b. Momentary push type*
 c. Momentary pull type d. None of the above
35. EICAS event record s/w is used
 a. In air only b. On ground only
 c. In air or on ground * d. None of the above
36. Which switch on display control panel is used to activate the recording of fault data relevant to environmental control system, electrical power, hydraulic system
 a. Engine display switch
 b. Event record switch *
 c. Status display switch
 d. Computer select switch
37. If any malfunction occurs in EICAS, it is recorded (by event record s/w) automatically called ___
 a. A manual event b. An auto event *
 c. A physical event d. A primary event
38. EICAS event record switch enables the flight crew to record a suspect malfunction for storage and this is called a
 a. One time event b. An auto event
 c. Manual event * d. Secondary event
39. When computer select switch on EICAS display select panel is in the 'AUTO' position it selects the ___ and automatically switches to other computer in event of failure
 a. Left or primary computer *
 b. Right or secondary computer
 c. Left or secondary computer
 d. Right or primary computer

40. Display brightness control inner knob of EICAS display select panel controls the
- Brightness balance between displays
 - Intensity of the displays *
 - Oil pressure
 - Oil temperature
41. The outer knob of display brightness control of EICAS display select panel controls _____
- Intensity of displays
 - Brightness balance between displays *
 - Oil pressure
 - Oil temperature
42. The reference cursor is positioned on thrust indicator display by _____
- Pushing the inner knob of EICAS thrust reference set switch
 - Pulling the outer knob of EICAS thrust reference set switch
 - Pulling and rotating the outer knob of EICAS thrust reference switch
 - Pulling and rotating the inner knob of EICAS thrust reference set switch *
43. Which of the following switch on EICAS display select panel clear the alerts from the display when the excess limit no longer exits
- Maximum indicator reset switch *
 - Computer select switch
 - Engine display switch
 - Status display switch
44. If any malfunction occurs in engine and air frame system, appropriate messages are generated and displayed on
- Lower display unit of EICAS
 - Upper display unit of EICAS *
 - Both a. and b.
 - None of the above
45. Maximum how many alert messages can be displayed on EICAS upper display unit _____
- 10
 - 11 *
 - 12
 - 13
46. Level A alert messages on upper display unit means
- Cautions requiring immediate crew awareness and possible action
 - Warning requiring immediate corrective action *
 - Advisories requiring crew awareness
 - None of the above
47. Level B alert messages on upper display unit means
- Advisories requiring immediate crew awareness
 - Warning requiring immediate corrective action
 - cautions requiring immediate crew awareness and possible action *
 - None of the above
48. Level C alert message on upon display unit means
- Advisories requiring crew awareness *
 - Caution requiring corrective action
 - Warning requiring immediate corrective action
 - None of the above
49. Warning (on upper display unit of EICAS) requiring immediate corrective action shows which level of urgency
- Level C alert messages
 - Level B alert messages
 - Level A alert messages *
 - Level D alert messages
50. Advisories (on upper display unit of EICAS) requiring crew awareness shows which level of urgency
- Level D alert messages
 - Level C alert messages *
 - Level B alert messages
 - Level A alert messages
51. Level A alert messages are displayed in
- Green
 - Amber
 - Blue
 - Red *
52. Level B alert messages are displayed in
- Green
 - Amber *
 - Red
 - Blue
53. An aural warnings (e.g. fire bell) from a central warning system are given in case of
- Level A alert messages *
 - Level B alert messages
 - Level C alert messages
 - Level D alert messages
54. No caution lights or aural tones are associated with this level of alert messages
- Level A
 - Level B
 - Level C *
 - Level D
55. An aural tone is repeated twice in this level of alert messages
- Level A
 - Level B *
 - Level C
 - Level D
56. In order to differentiate between a caution and an advisory
- The caution is always indented one space to the right
 - The advisory is always indented one space to the left *
 - The advisory is always indented one space to the right
 - The caution is always indented two spaces to left
57. Master warning and caution lights are located adjacent to the EICAS display units together with a
- 'Cancel' switch and 'Display' switch
 - 'Recall' switch and 'Display' switch
 - 'Cancel' switch and 'Recall' switch *
 - None of the above

58. Pushing the cancel switch removes
- Only the caution messages from the display
 - Only the advisory messages from the display
 - Only the caution and warning messages from display
 - Only the caution and advisory messages from display *
59. By pushing the cancel switch
- Advisory messages can not be cancelled
 - Caution messages can not be cancelled
 - Warning messages can not be cancelled
 - Warning messages can not be cancelled *
60. 'Recall' switch is used to bring back the
- Caution and warning messages into the display
 - Caution and advising messages into the display *
 - Advisory and warning messages into the display
 - Only caution message in to the display
61. If the lower display unit should fail when secondary information is being displayed on it an amber alert message appear
- At the top right of upper display unit
 - At the bottom right of upper display unit
 - At the bottom left of the upper display unit
 - At the top left of the upper display unit *
62. If the lower display unit of EICAS fail, when secondary information is being displayed on it _____ alert message appear at top left of the upper display unit
- A green
 - A yellow
 - An amber *
 - A blue
63. If the display select panel fails the advisory message 'EICAS CONTROL PANEL' appears at the
- Top left of the upper display unit *
 - Top left of the bottom display unit
 - Top right of the upper display unit
 - Top right of the bottom display unit
64. In the event that a total loss of EICAS display occurs
- Stand by engine indicator provides secondary engine information
 - Stand by engine indicator provides primary engine information *
 - Horizon indicator provides primary engine information
 - No information can be provided
65. Maintenance control panel is for use by
- Pilot only
 - Car pilot only
 - Maintenance Engineers *
 - None of the above
66. Maintenance control panel is used for the purpose of displaying maintenance data stored in system computer memories _____
- During flight
 - On ground operation
 - During flight or ground operation *
 - None of the above
67. The left hand display unit of E CAM is dedicated to information on status of systems, warnings and corrective action in
- Pictorial format
 - Synoptic format
 - A sequenced check list format *
 - None of the above
68. The right hand display unit of ECAM is dedicated to associate information is
- A sequenced check list format
 - Pictorial format
 - Synoptic format
 - Pictorial or synoptic format *
69. There are 4 display modes of ECAM, out of which
- One is automatically selected and three are manual
 - Three are automatically selected and one is manual*
 - Two are automatically selected and two are manual
 - None of the above
70. Control panel unit of ECAM has SGU selector s/w, SGU refers
- Speed generating unit
 - Standby gyro unit
 - Symbol generator unit *
 - Speed gain unit
71. If a failure is detected by an ECAM SGU's internal self test circuit, the 'FAULT' caption is illuminated
- White
 - Yellow
 - Green *
 - Amber
72. When FAULT caption is extinguished ECAM SGU 'OFF' caption illuminate
- Red
 - Yellow
 - White *
 - Green
73. When synoptic display switches on ECAM control panel are pressed, they illuminate
- Red
 - White *
 - Green
 - Amber
74. CLR switch on control panel of ECAM illuminates _____ whenever a warning or status message is displayed on left hand display unit
- Red
 - Green
 - White *
 - Amber
75. Which ECAM control panel switch, enables previously cleared warning message to be recalled, provided the failure conditions which initiate them still exist
- CLR switches
 - RCL switches *
 - STS switches
 - SGU switches
76. Which switch on ECAM control panel permits manual selection of an aircraft status message

- a. CLR switch *
 - b. STS switch
 - c. RCL switch
 - d. RCL switch
77. STS switch on ECAM control panel means
- a. Standard message switch
 - b. Selective switch
 - c. Status message switch *
 - d. None of the above
78. IN ECAM maintenance panel, when 'INPUTS' switch is pressed
- a. A 'TEST' caption is illuminated yellow
 - b. A 'TEST' caption is illuminated white *
 - c. A 'DISPLAY' caption is illuminated yellow
 - d. A 'DISPLAY' caption is illuminated white
79. ECAM maintenance panel has
- a. Display switch
 - b. Inhibited warning over ride switch
 - c. In put test switch
 - d. All of the above *
80. ECAM maintenance panel does not have the following switch
- a. Input test switch
 - b. RECALL s/w and SELF TEST s/w *
 - c. Display switch
 - d. IN HIB OVRD switch

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CHAPTER - 37

FLIGHT MANAGEMENT SYSTEM

1. CDU in flight management system refers to
 - a. Centralised digital unit
 - b. Command digital unit
 - c. Control and display unit *
 - d. Controls display unit
2. FMS stands for
 - a. Flight management system *
 - b. Fuel mode selection
 - c. Full maintenance system
 - d. Flight moving system
3. A flight management computer incorporates
 - a. a bubble memory
 - b. a C-MOS RAM
 - c. a UV-PROM
 - d. all of the above *
4. A bubble memory of flight management computer is for
 - a. Operation program which may be reprogrammed at card level
 - b. Holding the bulk navigation and aircraft performance characteristics data bank *
 - c. Holding specific navigation and performance data and active and secondary flight plan
 - d. None of the above
5. A C - MOS RAM of flight management computer is for
 - a. Holding specific navigation and performance data downloaded from bubble memory *
 - b. For operation program which may be reprogrammed at card level
 - c. Both a. and b.
 - d. None of the above
6. UV-PROM of flight management computer is for ____
 - a. Holding the bulk navigation and aircraft performance characteristics data bank
 - b. The operation program which may be reprogrammed at card level *
 - c. Either a. or b.
 - d. None of the above
7. What does the TMS stands for in flight management system
 - a. TOP management system
 - b. True management system
 - c. Thrust management system *
 - d. None of the above
8. FMC stands for
 - a. Flight management computer *
 - b. Flight maintenance command
 - c. Flight control unit
 - d. Flash memory computer
9. CRT of CDU has a
 - a. 1 in × 2 in screen
 - b. 2 in × 3 in screen *
 - c. 3 in × 4 in screen
 - d. 3 in × 4 in
10. The CRT has a 2 in × 3 in screen and enables data to be displayed over a
 - a. 12 (row) × 6 (column) matrix
 - b. 6 (column) × 12 (row) matrix
 - c. 6 (column) × 13 (row) matrix
 - d. 13 (column) × 6 (row) matrix *
11. What is PDCS in flight management system
 - a. Programming and digital computer system
 - b. Performance data computer system *
 - c. Performance detecting computer system
 - d. Permanent data computer system
12. The 'CLER' key of the CDU is used to remove
 - a. Any of the data displays
 - b. All records from computer data base
 - c. Only incorrect entries from the scratch pad *
 - d. None of the above
13. What is the purpose of EXEC key
 - a. To select performance pages
 - b. To delete incorrect scratch pad entries
 - c. To promote a temporary plan to active status *
 - d. None of the above
14. What is the purpose of PERPF ____
 - a. Selection of performance pages *
 - b. Selection of fuel pages
 - c. Selects secondary flight plan facility
 - d. To delete incorrect scratch pad entries
15. To check or update aircraft's position which key of keyboard function keys is to be used
 - a. Fuel key
 - b. HDL SEL key
 - c. FIX key *
 - d. START key
16. Purpose of start key is
 - a. To select fuel pages
 - b. To select 'START DATA REQUIRED' pages for flight crew to initiate and construct flight plans *
 - c. To delete incorrect scratch pad entries
 - d. None of the above
17. ENG OUT Function key presents
 - a. Performance data pages relating to engine out operation.*
 - b. To delete incorrect scratch pad entries.
 - c. Both a. and b..
 - d. None of the above.

18. For the selection of heading to be flown automatically via the FMS following key is used
 - a. PERF key
 - b. DATA key
 - c. HDG SEL key *
 - d. CLEAR key

19. P - POS function key
 - a. Changes a navigation leg display to the beginning of next phase of the flight plan.
 - b. Selects the fuel pages.
 - c. Returns display to show the active navigation leg page i.e the aircraft's present position.*
 - d. None of the above.

20. FUEL key is for
 - a. Selection of full pages
 - b. Selection of fuel pages *
 - c. Selection of blank pages
 - d. Selection of performance pages

n n n

CHAPTER - 38

PRINCIPLES OF FLIGHT

1. All material objects are attracted towards earth by a force called
 - a. Centrifugal force
 - b. Centripetal force
 - c. Gravity *
 - d. None of the above
2. In order, for an object, to rise from earth's surface and to maintain itself in a continual ascent, the attraction which gravity has for an object must be opposed by the development of a force called
 - a. Drag
 - b. Lift *
 - c. Thrust
 - d. None of the above
3. When the angle of attack is increased, the velocity of airflow over the upper surface of wing _____ than over the lower surface
 - a. Increase *
 - b. Decrease
 - c. Remain constant
 - d. Becomes zero
4. Apart from angle of attack, what other factor can affect pressure distribution
 - a. Velocity of air flow.
 - b. The shape and thickness of the airfoil section adopted for a wing.
 - c. Wing plan form and its area.
 - d. All of the above *
5. The centre of pressure is the point
 - a. About which the pitching moment is constant regardless of angle of attack.
 - b. From which total lift force act *
 - c. At which the boundary layer airflow tends to break away from the wing surface.
 - d. None of the above.
6. When the wing is at zero angle of attack, the aircraft remains attached to both surfaces of wing and
 - a. Very high lift is generated
 - b. Low lift is generated
 - c. No lift is generated *
 - d. None of the above
7. The movement of the body through a fluid (liquid or air) always produces a force that tends to oppose the movement. Such a force is known as
 - a. Lift
 - b. Drag *
 - c. Thrust
 - d. Weight
8. Which of the following is not a type of drag
 - a. Form drag
 - b. Interference drag
 - c. Induced drag
 - d. International drag *
9. _____ refers to the immediate reaction of the aircraft and its tendency to return to equilibrium while displacement
 - a. Standard stability
 - b. Static stability *
 - c. Dynamic stability
 - d. None of the above
10. _____ stability refers to the subsequent long term reaction which is of an oscillatory nature about a neutral or equilibrium position
 - a. Dynamic *
 - b. Static
 - c. Standard
 - d. None of the above
11. The property of a system where by it returns to a state of equilibrium after it has been displaced from a state of rest or state of uniformities is called
 - a. Durability
 - b. Resistivity
 - c. Stability *
 - d. None of the above
12. Stability is _____ when, subsequent to the displacement, the forces and moments acting on aircraft return it to its original study flight path
 - a. Negative
 - b. Positive *
 - c. Neutral
 - d. None of the above
13. The stability is _____ if the forces and moment cause the aircraft to take up a new flight path of constant relationship to the original
 - a. Neutral *
 - b. Negative
 - c. Positive
 - d. None of the above
14. The stability is _____ if the aircraft is caused to diverge from the original study flight path
 - a. Neutral
 - b. Negative *
 - c. Positive
 - d. None of the above
15. When an aircraft has a tendency to return to a trimmed angle of attack position following a displacement, it is said to have a
 - a. Negative static longitudinal stability
 - b. Positive static longitudinal stability *
 - c. Positive dynamic lateral stability
 - d. None of the above
16. The centre of gravity location which produces zero stop and neutral static stability is referred to as the
 - a. Natural point
 - b. Neutral point *
 - c. Negative point
 - d. Nil point
17. The distance of the centre of gravity at any time from the neutral point is known as
 - a. Dynamic margin
 - b. Standard margin *
 - c. Static margin
 - d. None of the above
18. The distance of the centre of gravity at any time from the neutral point is known as static margin and is an indication of the degree of
 - a. Dynamic margin
 - b. Standard margin *
 - c. Static margin
 - d. None of the above

- a. Longitudinal stability *
 b. Lateral stability
 c. Both a. and b.
 d. None of the above
19. Longitudinal dynamic stability consists of 3 basic modes of oscillation which mode is refers to as phugoid
 a. First mode * b. Second mode
 c. Third mode d. Forth mode
20. First mode of oscillation of longitudinal dynamic stability is of
 a. Very short period b. Very long period *
 c. Short period d. None of the above
21. Longitudinal dynamic stability, first mode referred to as phugoid involves noticeable variations in
 a. Pitch attitude b. Altitude
 c. Airspeed d. All of the above *
22. The second mode of longitudinal dynamic stability is a short period motion which can be assumed to take place with negligible change in
 a. Pitch up b. Roll
 c. Velocity * d. None of the above
23. The third mode of oscillation longitudinal dynamic stability is usually a _____
 a. Very long period oscillation and occurs in stick fixed case
 b. Very short period oscillation and occurs in stick fixed case
 c. Very long period oscillation and occurs in stick free case
 d. Very short period oscillation and occurs in stick free case *
24. Directional stability is also known as
 a. Weather hen stability
 b. Weather clock stability
 c. Weather cock stability *
 d. Weather lock stability
25. The static margin is
 a. The distance between the CG of an aircraft and the centre of pressure.
 b. The CG location which produces neutral static stability.*
 c. An indication of the degree of longitudinal stability.
 d. None of the above
26. The relative effect of the combined rolling, yawing and side slip motions produced by aerodynamic coupling, determine the
 a. Longitudinal static stability of an ac
 b. Longitudinal dynamic stability of an ac
 c. Lateral static stability of an ac
 d. Lateral dynamic stability of an ac *
27. If the stability characteristics are not satisfactory the complex interaction of the motions will produce the following forms of dynamic instability
 a. Directional divergence
 b. Spiral divergence
 c. An oscillatory mode termed dutch roll
 d. All of the above *
28. This form of instability exist when the directional static stability is very large compared with lateral stability
 a. Directional divergence
 b. Spiral divergence *
 c. Dutch roll
 d. None of the above
29. This form of instability is a simple divergence in way which may occur if the aircraft is statically unstable about vertical axis
 a. Directional divergence *
 b. Dutch roll
 c. Spiral divergence
 d. None of the above
30. This is an oscillatory mode of instability, which may occur if the aircraft has positive directional static stability
 a. Directional divergence
 b. Spiral divergence
 c. Dutch roll *
 d. None of the above
31. Ailerons provide
 a. Longitudinal or pitch control
 b. Lateral control or roll displacements *
 c. Yawing movements or directional movement
 d. None of the above
32. Elevators provide
 a. Yawing movements or directional movement
 b. Lateral control or roll displacements
 c. Longitudinal or pitch control *
 d. None of the above
33. Rudder provides
 a. Yawing movements or directional movement *
 b. Lateral control or roll displacements
 c. Longitudinal or pitch control
 d. None of the above
34. Ailerons provide lateral control or roll displacement about the
 a. Lateral axis b. Longitudinal axis *
 c. Normal axis d. None of the above
35. Elevators provide longitudinal or pitch control about the
 a. Normal axis b. Longitudinal axis
 c. Lateral axis * d. None of the above
36. Rudder provides yawing moments or directional control about the
 a. Lateral axis b. Longitudinal axis
 c. Normal axis * d. None of the above

37. Ailerons are always connected so that in response to instinctive movements of the control wheel by the pilot
- They move in same direction
 - They move in opposite direction *
 - Either in same direction or in opposite direction
 - None of the above
38. When the control wheel is turned to left
- The left wing aileron is lowered and right aileron raised.
 - The left wing and right wing, both ailerons are raised.
 - The left wing aileron is raised and right wing aileron is lowered *
 - None of the above.
39. Elevators provide pitch control about vertical axis and also assist the horizontal stabilizer to maintain
- Longitudinal stability *
 - Lateral stability
 - Normal stability
 - None of the above
40. Elevators are connected to the control column which can be moved
- Left or right
 - Back ward and forward *
 - Left or right and backward and forward
 - None of the above
41. Whenever control column is moved backwards,
- Elevators are lowered
 - Ailerons are lowered
 - Ailerons are raised
 - Elevators are raised *
42. When ever control column is moved forward
- Ailerons are lowered
 - Elevators are lowered *
 - Elevators are raised
 - aileron are raised
43. When the control column is moved backwards, aircraft is displayed by a
- Rolling moment about lateral axis
 - Yawing moment about longitudinal axis
 - Pitching moment about lateral axis *
 - Rolling movement about longitudinal axis
44. When the control column is moved backward, aircraft will be displaced into
- Nose - up attitude *
 - Nose - down attitude
 - Roll to left
 - Roll to right
45. When the control column is moved forward, aircraft will be displaced
- nose-up attitude
 - nose-down attitude *
 - roll to lift
 - roll to right
46. When the control column is moved backward, aircraft will be placed into nose up attitude, which is called
- Rolling
 - diving
 - Climbing *
 - none of the above
47. Forward movement of control column
- raises the elevator
 - lowers the elevator *
 - both a. and b. are correct
 - none of the above
48. Forward movement of control column, lowers the elevators to
- increase the lift of horizontal stabilizer *
 - decrease the lift of horizontal stabilizer
 - both a. and b. are correct
 - none of the above
49. Rudder is operated in response to instinctive movements by the pilot of a
- control column
 - pair of rudder padels *
 - particular electrical switch
 - none of the above
50. If the left rudder padel is pushed forward the rudder is turned to
- right
 - up
 - left *
 - down
51. If the left rudder pedal is pushed forward, the rudder will turn to left and the force produced as the vertical stabilizer sets up a
- pitch moment
 - rolling moment
 - yawing moment *
 - none of the above
52. If the left rudder padal is pushed forward, the force produced will displace the aircraft nose to
- right
 - left
 - up *
 - down
53. If the right rudder padal is pushed forward, the force produced will displace the aircraft nose to
- left
 - up
 - down
 - right *
54. In many types of large aircraft, where control surfaces are arranged in pairs, at low speed _____ produce lateral control.
- in board ailerons only
 - only out board ailerons *
 - both inboard and outboard ailerons
 - none of the above
55. In large a/c. when control surfaces are aroused in pairs, at high speeds, lateral control is taken over by:
- in board ailarous *
 - outboard aileraus
 - both inboard and outboard ailerons
 - none of these

56. The travel of each forward section of rudder is approx
 a. 20° left or right from neutral position
 b. 22° left or right from neutral position
 c. 23° left or right from neutral position *
 d. none of the above
57. The travel of each after section of rudder is approx
 a. 21° left or right relation to the forward section
 b. 22° left or right relative to the forward section *
 c. 23° left or right relative to the forward section
 d. 24° left or right relation of the forward section
58. If an aircraft has directional static instability, displacement in yaw will cause
 a. spiral divergence
 b. directional divergence *
 c. dutchroll
 d. none of the above
59. The purpose of primary stopper in a flight control system is to
 a. prevent damage to the system when the aircraft is parallel in high wind condition
 b. restrict the movement of the controls to their correct range *
 c. act as a stop in the event of control flutter
 d. none of the above
60. On a delta wing aircraft such as concord, a control surface at each trailing edge can perform the function of both ailerons and elevators, such a control surface is called
 a. stabilator
 b. ruddervators
 c. elevon *
 d. eleron
61. In the case of some light aircraft having 'V' or butterfly tail, the control surfaces operate as either a rudder or as elevators, such control surfaces are known as
 a. elevon
 b. ruddervators *
 c. stabilator
 d. none of the above
62. In some aircraft, elevators are dispensed with and are substituted with a movable horizontal stabiliser, such a stabiliser is known as
 a. elevon
 b. ruddervators
 c. stabilator *
 d. none of the above
63. What does FBW stands in reference with powered flight control
 a. fixed both wings
 b. fly before wire
 c. fly between wire
 d. fly by wire *
64. A system in which wires carrying electrical signals from the Pilots Controls replace mechanical linkages entirely is called :
 a. RBW system
 b. WBF system
 c. FBW system *
 d. None of the above
65. An FBW system is one in which wires carrying electrical signals from Pilot's Control replaces
 a. electrical linkages
 b. chemical linkages
 c. mechanical linkages entirely *
 d. none of the above
66. With reference to flight controls, what does RVDT, stands for
 a. resistance variable differential transformer
 b. rotary variable differential transformers *
 c. rotary value differential transducers
 d. none of the above
67. With reference to flight controls, what does LVDT stands
 a. local value differential transformer
 b. low value differential transformer
 c. linear variable differential transformer *
 d. linear valuable differential transducer
68. _____ acts at right angles to the direction of airflow from centre of pressure
 a. lift *
 b. weight
 c. drag
 d. thrust
69. Weight act
 a. vertically upwards
 b. vertically downwards *
 c. horizontally upwards
 d. horizontally downwards
70. The forward propulsive force produced by either a turbine engine or a propeller to overcome the opposing total drag force is called
 a. lift
 b. drag
 c. weight
 d. thrust *
71. To be in equilibrium is a straight and level flight attitude at constant speed
 a. lift must equal weight
 b. thrust must equal drag
 c. lift must equal weight and thrust must equal drag *
 d. either lift must equal weight or thrust must equal drag
72. Climbing and descending are
 a. roll attitude manouvers
 b. pitch attitude manouvers *
 c. yaw attitude manouvers
 d. none of the above
73. Climbing and descending are pitch attitude manouvres which are set up by upward and downward movements respecting of the
 a. elevators *
 b. rudders
 c. ailerons
 d. none of the above
74. The horizontal stabilizer is deflected to produce a _____ angle of attack for the setting up of the climbing attitudes
 a. positive
 b. negative *
 c. zero
 d. none of the above

75. The horizontal stabilizer is deflected to produce a _____ angle of attack for the setting up of the descending attitude
 a. zero b. negative
 c. positive * d. none of the above
76. The horizontal stabiliser is deflected to produce a negative angle of attack for the setting up of _____
 a. descending attitude b. rolling attitude
 c. climbing attitude * d. yawing attitude
77. The horizontal stabilizer is deflected to produce a positive angle of attack for the setting up of _____
 a. descending attitude * b. rolling attitude
 c. yawing attitude d. climbing attitude
78. Rolling of an aircraft takes place about
 a. latitudinal axis b. longitudinal axis *
 c. normal axis d. none of the above
79. Rolling of an aircraft is initiated by deflecting the
 a. rudder in required direction
 b. elevator in required direction
 c. ailerons in required direction *
 d. none of the above
80. Elevators are displaced by
 a. manually and by movement of control column
 b. stabiliser movement through a neutral shift rod mechanism
 c. inputs from a Mach trim system
 d. all of the above are correct *
81. The stabilizer is connected directly to the pilot's control column via
 a. cables b. linkages
 c. hydraulic actuator d. all of the above *
82. The ratio of aircraft speed to the local speed of sound is called
 a. matching number b. Mach number *
 c. new number d. none of the above
83. Mach number is defined as the ratio of aircraft speed to the
 a. speed of light
 b. local speed of air
 c. local speed of sound *
 d. none of the above
84. Flaps are devices that form part of the _____ sections of the wings of an aircraft
 a. leading edge
 b. trailing edge *
 c. leading and trailing edge
 d. none of the above
85. When flaps are lowered, the angle of attack under the prevailing conditions
 a. is reduced * b. is increased
 c. remain unchanged d. none of the above
86. Lift is _____ by lowering flaps
 a. decreased b. increased *
 c. not affected d. decreased by two times
87. At the approach position, the increase of lift enables a _____ approach speed to be made
 a. higher b. lower *
 c. zero d. none of the above
88. During landing, flaps are lowered by pilot so that he can touch down at a _____
 a. higher speed b. zero speed
 c. lower speed * d. none of the above
89. For landing flaps are _____ and a higher drag permits a steeper approach without speed becoming excessive
 a. not lowered b. half raised
 c. fully raised d. fully lowered *
90. The increased lift co-efficient, when flaps are lowered, _____ the take off run of an aircraft
 a. can not shorten b. can also increase
 c. can also shorten * d. none of the above
91. Slats are cambered surfaces which, in the retracted position, lie flush with the
 a. lower surface of trailing edge section of a wing
 b. upper surface of trailing edge section of a wing
 c. lower surface of leading edge section of a wing
 d. upper surface of leading edge section of a wing *
92. Spoilers are _____ located in the upper surface of a wing in such a way that they can be raised to selected angular position
 a. flap type control surfaces *
 b. flop type control surfaces
 c. slat type control surfaces
 d. slot type control surfaces
93. Spoilers are flap type surfaces located in the _____ surfaces of a wing in such a way that they can be raised to selected angular position
 a. lower b. upper *
 c. middle d. none of the above
94. Reduction of the landing run of the aircraft after it has touched down is achieved by fully extending the spoilers on each wing this is generally known as
 a. 'air spoiler' b. 'sea' spoiler
 c. 'ground spoiler' * d. none of the above
95. A helicopter is able to
 a. descend and ascend vertically
 b. fly with no airspeed
 c. maintain a ground position with winds from any direction
 d. all of the above are correct *
96. Type / Types of rotor system of helicopters is /are

- a. semirigid or teetering b. articulated
c. hingeless d. all of the above *
97. The semi rigid or teetering type of rotor system is found
a. only on single bladed helicopter
b. only on two bladed helicopter *
c. only on three bladed helicopter
d. none of the above
98. Articulated rotor system incorporates _____
a. two hinges close to the hub
b. three hinges close to the hub *
c. four hinges close to the hub
d. five hinges close to the hub
99. The hinges of articulated rotor system are known as _____
a. flapping hinges, lifting hinges and rolling hinges
b. flapping hinges, thrust hinges and roll hinges
c. flapping hinges, dragging hinges and pitch change hinges *
d. flapping hinges, dragging hinges and yaw change hinges
100. Hingless rotor is _____
a. a rigid rotor
b. not a rigid rotor *
c. known as rigid rotor only
d. none of the above
101. The axis about which the blades rotate is _____
a. hub axis b. rotor axis
c. shaft axis * d. none of the above
102. _____ that is, perpendicular to plane of the tips of the blades as they go around the hub.
a. hub axis b. rotor axis *
c. shaft axis d. none of the above
103. _____ axis that is, perpendicular to the hub, which itself is free to tilt with respect to the shaft
a. hub axis * b. shaft axis
c. rotor axis d. none of the above
104. When the blades are rotating, they are producing
a. drag b. weight
c. lift * d. none of the above
105. When the blades are rotating, they are producing lift, which makes them move upward and _____ is also attempting to make them fly outwards
a. contripital force b. centrifugal force *
c. gravitational force d. none of the above
106. The main source of controlling moments on the helicopter is _____
a. fin b. tail rotor
c. main rotor * d. none of the above
107. The helicopter will lift off and climb to a height, when the total lift is
a. equal to weight b. greater than weight *
c. lesser than weight d. none of the above
108. The main rotor torque moment attempts to rotate the fuselage in the opposite direction to the mainrotor by the virtue of
a. Newton's first law b. Newton's second law
c. Newton's third law * d. none of the above
109. The forces which give rise to the coning angle are
a. thrust and centrifugal
b. lift and centripetal
c. lift and centrifugal *
d. none of the above
110. When the collective pitch lever is operated, the pitch of each blade of the main rotor is
a. either increased or decreased by the same amount*
b. either increased or decreased so that each blade is at a different angle
c. increased by the same amount to provide lift only
d. none of the above



CHAPTER - 39

SERVOMECHANISM AND AUTOMATIC CONTROL FUNDAMENTALS

1. If pilot moves the control column forward to apply downward movement of elevators. It will cause ____
 - a. nose up movement of aircraft
 - b. nose down movement of aircraft *
 - c. straight and forward movement of aircraft
 - d. none of the above
2. In order to level out at the new altitude, from dive the control column will be
 - a. pulled back *
 - b. pushed forward
 - c. put in neutral
 - d. will not be disturbed
3. When aircraft is flying in level flight attitude, the elevators should remain in
 - a. down ward position
 - b. up ward position
 - c. neutral position *
 - d. none of the above
4. In case of the helicopter, the pilot establishes the discount by:
 - a. lowering the collective pitch lever
 - b. adjusting the throttle to maintain engine speed
 - c. operating the yaw padals to maintain balance
 - d. all of the above are correct *
5. AFCS stands for
 - a. automatic flight control science
 - b. automatic flight control system *
 - c. armed force control system
 - d. automatic flying club system
6. The role of AFCS is generally to
 - a. overcome a stability and control deficiency
 - b. improve handling ride qualities in general or in some specific mode
 - c. carry out manoeuvre that the pilot is unable to perform due to accuracy required
 - d. all of the above *
7. Which component of AFCS, measure the relevant parameters and transmit the information in the computation group :
 - a. computers
 - b. output devices
 - c. input devices
 - d. sensors *
8. Which component of AFCS convert the information from the sensors into the signals which are fed to the system output devices
 - a. input devices
 - b. computers *
 - c. generators
 - d. sensors
9. Which component of AFCS, convert the compared signals into a form which will result in nursery aircraft control surface movements
 - a. sensors
 - b. computer
 - c. output devices *
 - d. input devices
10. Which sensor is used to measure the parameters roll, pitch and yaw (Rate) in AFCS
 - a. space gyroscope
 - b. rate gyroscope *
 - c. Earth gyroscope
 - d. tied gyroscope
11. Which is the alternate sensor for rate sensor is used to measure roll pitch and yaw (rate) in AFCS _____
 - a. Vertical speed gyroscope
 - b. attitude gyroscope *
 - c. altitude gyroscope
 - d. none of the above
12. Which sensor is used to measure acceleration in AFCS
 - a. accelerameter *
 - b. barometer
 - c. both accelerameter and barometer
 - d. none of the above
13. Which sensor is used to measure airspeed parameter in AFCS
 - a. Barometric altitude
 - b. ROCI / Bank Indicator
 - c. ROCI / Mach
 - d. ASI / mach *
14. Altitude parameter in AFCS is sensed by
 - a. doppler
 - b. radio altitude sensor
 - c. barometric altitude sensor *
 - d. none of the above
15. Doppler in AFCS is used to measure _____
 - a. air speed
 - b. ground speed (along / across) *
 - c. altitude
 - d. none of the above
16. Differential pressure system is a alternate sensor in AFCS to measure the parameters _____
 - a. sideslip
 - b. angle of attack
 - c. both side slip and angle of attack *
 - d. none of the above
17. For measuring flight path aid navigation data, AFCS, which sensor is used _____
 - a. ILS
 - b. MLS
 - c. Inertial navigation system
 - d. All of the above *
18. The main sensor to measure the angle of attack parameter in AFCS is
 - a. Vane *
 - b. Yaw vane
 - c. doppler
 - d. accelerameter
19. Radar altimeter sensor is used in AFCS to measure
 - a. height (above ground) *

- b. angle of attack
c. heading
d. side slip
20. In AFCS, ILS stand for
a. initial landing system
b. instrument loading system
c. instrument landing system *
d. none of the above
21. With the autopilot engaged, the pilot
a. directly controls the aircraft
b. is not required in aircraft
c. no longer directly controls the aircraft, but select the conditions that he wants the auto-pilot to maintain *
d. none of the above
22. Which alternate sensor is there in AFCS to measure heading parameter
a. attitude and heading reference system *
b. altitude and heading reference system
c. air data system
d. differential rate
23. Which main sensor is used in AFCS for pitch and roll attitudes :
a. rate gyroscope only
b. vertical reference gyroscope *
c. accelerometer
d. doppler
24. _____ increases the signal level from the sensor to a high enough level to be effective as an output
a. amplification * b. integration
c. limiting d. none of the above
25. Signal shapers may be considered
a. linear amplifiers
b. non - linear amplifiers *
c. both a. and b. are correct
d. none of the above
26. Programs in computer of AFCS are used to produce outputs that will allow an aircraft to fly _____
a. post determined maneuvers
b. in level flight only
c. predetermined maneuvers *
d. none of the above
27. Which function of computer of AFCS is used to restrict the effect of parameter change to certain limits
a. amplification b. integration
c. limiting * d. none of the above
28. _____ are used to derive pseudo - information i.e. rate information can be integrated to produce attitude data.
a. differentiation b. integration *
c. limiting d. shaping
29. In duplex system of autopilot
a. two 'lanes' are used * b. three 'lanes' are used
c. four 'lanes' are used d. none of the above
30. In duplex system not only two sensors and computers but also two _____
a. actuators
b. hydraulics
c. electrical system and switches
d. all of the above *
31. In triplex system each channel of system has _____
a. two lanes b. three lanes *
c. four lanes d. five lanes
32. _____ is an extension of triplex system to include four lanes per channel
a. duplex system b. triplex system
c. quadruplex system * d. none of the above
33. A servo mechanism may be broadly defined as a _____ control system in which a small power input controls a much larger power output in a strictly appropriate manner
a. open loop b. close loop
c. free loop * d. none of the above
34. The servo mechanism has following class /classes
a. position control b. speed control
c. both a. and b.* d. none of the above
35. Using only inherent friction which damping in achievement
a. light damping * b. heavy damping
c. either light or heavy d. none of the above
36. If there is too much extra viscous friction, the system is
a. lightly damped b. heavily damped *
c. slightly damped d. none of the above
37. The degree of damping which just prevents any overshoot is known as
a. heavy damping b. optimum damping
c. critical damping * d. none of the above
38. Damping which allows one small overshoot and gives the smallest settling time in known as
a. optimum damping * b. critical damping
c. light damping d. heavy damping
39. Optimum damping allows one small overshoot and gives
a. biggest settling time b. smallest settling time *
c. no settling time d. none of the above
-

CHAPTER - 40

SENSING OF ATTITUDE CHANGES

1. A gyroscope is basically a _____.
 - a. electrical devies
 - b. electronics device
 - c. mechanical device *
 - d. chemical device
2. A gyroscope is basically a mechanical device, the essential element of which is a _____.
 - a. light metal wheel
 - b. heavy metal wheel *
 - c. light non - metal wheel
 - d. heavy non - metal wheel
3. The essential element of a gyroscope is a heavy metal wheel which is known as _____.
 - a. rotor *
 - b. motor
 - c. stator
 - d. resistor
4. In order to provide spinning freedom, the rotor shaft is pivoted in a ring called _____.
 - a. small ring
 - b. single ring
 - c. gimbal ring *
 - d. none of the above
5. The gyroscope posses the following property/properties _____.
 - a. rigidity
 - b. procession
 - c. precession
 - d. rigidity and procession both *
6. Gyroscopic inertia is also called _____.
 - a. precession
 - b. resistivity
 - c. rigidity *
 - d. none of the above
7. Rigidity of gyroscope depend on the principle of _____.
 - a. conversation of angular velocity
 - b. conservation of angular speed
 - c. conservation of angular momentum *
 - d. none of the above
8. The property which resist any force which tends to change the plane of rotation of the rotor of a gyroscope is _____.
 - a. conductivity
 - b. rigidity *
 - c. precession
 - d. none of the above
9. Rigidity of a gyroscope depends upon _____.
 - a. the mass of the rotor
 - b. the angular momentum of the rotor
 - c. the radius of gyration
 - d. all of the above *
10. The distance at which the mass acts from the axis of rotation i.e. _____.
 - a. the diameter of the gyration
 - b. the radius of the gyration *
 - c. speed of the gyration
 - d. none of the above
11. The angular rate of change in the direction of the plane of rotation under the influence of an applied force is called _____.
 - a. rigidity
 - b. precession *
 - c. both a. and b.
 - d. none of the above
12. The rate of change in direction of the plane of rotation is proportional to the strength of the applied force and _____.
 - a. directly proportional to moment of inertia of the rotor
 - b. inversely proportional to the moment of inertia of rotor *
 - c. both a. and b. are correct
 - d. none of the above
13. The direction in which precession of a gyroscope takes place is dependent on the _____.
 - a. direction of rotation of its rotor
 - b. direction of applied force
 - c. the direction of rotation of its rotor and direction of applied force *
 - d. none of the above
14. As soon as the force and torque are with drawn _____.
 - a. precession continues
 - b. precession ceases *
 - c. both a. and b. are correct
 - d. none of these
15. Which of the following gyroscope would serve no useful purpose as an aircraft attitude sensing device _____.
 - a. earth gyroscope or rate gyroscope
 - b. rate or tied gyroscope
 - c. free or space gyroscope *
 - d. none of the above
16. The earth rotates about its axis _____.
 - a. 90° every day
 - b. 180° every day
 - c. 270° every day
 - d. 360° every day *
17. The rate of rotation of earth is _____.
 - a. 15° per second
 - b. 15° per minute
 - c. 15° per hour *
 - d. 15° per day
18. Gyroscope which has two degrees of freedom and can be used for detecting angular displacements about fixed datum established by the properties of rigidity is _____.
 - a. displacement gyroscope *
 - b. rate gyroscope

- c. both displacement and rate gyroscope
d. none of the above
19. Rate gyroscope has _____
a. two degree of freedom
b. three degree of freedom
c. one degree of freedom *
d. no freedom
20. A rate gyroscope has following advantages / advantages over displacement gyroscope _____
a. more rapid detection of small attitude changes
b. smoother corrective action without overshoot tendencies
c. both a. and b.*
d. none of the above
21. In rate gyroscope, control signals are provided at a rate proportional to that at which attitude change occur this is called :
a. signal /signal control
b. rate / rate control *
c. change / change control
d. none of the above
22. The rate of precession depends upon _____
a. the strength and direction of applied force
b. the moment of inertia of rotor
c. the angular velocity of the rotor
d. all of the above *
23. The axis about which a force is applied is termed
a. output axis b. input axis *
c. horizontal axis d. none of the above
24. The axis about which precession takes place is termed the
a. output axis * b. input axis
c. horizontal axis d. none of the above
25. _____ are used for the purpose of maintaining gyroscope axes at their respected reference datums
a. magnetic switches b. levelling switches
c. electrolytic switches *d. none of the above
26. Electrolytic switches are at a disadvantages when exposed to the forces developed under
a. accelerating conditions
b. decelerating conditions
c. turning conditions
d. accelerating, decelerating and turning conditions*
27. Erection system is consist of
a. roll erection switch
b. pitch erection switch
c. yaw and roll erection switch *
d. roll and pitch erection switch
28. The roll erection s/w and pitch erection switches, both are of
a. fixed resistance type b. variable resistance type *
c. variable capacitance type
d. fixed capacitance type
29. The roll erection switch is connected to torque motor mounted parallel to the
a. roll axis b. yaw axis
c. pitch axis * d. none of the above
30. The pitch erection switch is connected to torque motor mounted parallel to the
a. roll axis * b. pitch axis
c. yaw axis d. none of the above
31. The roll erection s / w connected to a torque motor such that _____
a. stator and rotor both are fixed to outer gimbal ring
b. stator is fixed to inner gimbal ring and rotor is fixed to outer gimbal ring
c. stator is fixed to outer gimbal ring and rotor is fixed to inner gimbal ring *
d. stator and rotor both are fixed to inner gimbal ring
32. The pitch erection s/w which is mounted parallel to roll axis is connected to torque motor, having its _____
a. stator and rotor fixed to inner gimbal ring
b. rotor connected to outer gimbal ring and stator fixed to frame of unit *
c. stator and rotor fixed to outer gimbal ring
d. none of the above
33. Locations of attitude sensing elements, must be in areas where flexural frequency sensing is at a
a. maximum b. minimum *
c. fighter rate d. none of the above
34. In a force balancing rate gyroscope, balancing is achieved _____
a. mechanically by utilising a hair spring
b. electrically by a torque motor acting on gimbal ring*
c. balancing is not required
d. none of the above
35. On which of the following factors, rigidity of a gyroscope does not depend _____
a. the angular movement of the rotor
b. the radius of the gyration
c. the mass of the rotor
d. the mass of the stator *
-

CHAPTER - 41

COMMAND SIGNAL DETECTION

1. The fundamental operating principle of inductive element is based on that the
 - a. induction transformer
 - b. conventional transformers *
 - c. conduction transformer
 - d. none of the above
2. In E & I bar sensors, the centre limb of the fixed E - shaped core is wound with a
 - a. primary coil *
 - b. secondary coil
 - c. both primary and secondary coil
 - d. none of the above
3. In E & I bar sensors _____ of the fixed E shaped core is wound with primary coil
 - a. the centre limb *
 - b. top outer limb
 - c. bottom outer limb
 - d. none of the above
4. The centre limb of the Fixed E - shaped core is wound with primary coil is supplied with
 - a. direct current
 - b. no current
 - c. alternating current *
 - d. none of the above
5. Outer limbs of E - shaped core in E & I bar sensor is wound with a _____
 - a. primary coil
 - b. secondary coil *
 - c. Both primary and secondary coil
 - d. none of the above
6. Where the I bar of E & I sensor is in neutral position, the air gaps are
 - a. not equal
 - b. maximum
 - c. equal *
 - d. none of the above
7. When the I bar of E & I sensor is in neutral position, the output from the coils is
 - a. maximum
 - b. minimum
 - c. zero *
 - d. none of the above
8. When the attitude sensing element detects a change in attitude _____
 - a. I bar remain is the centre
 - b. I bar is deflected through a small angle
 - c. I bar will deflect but air gap be equal *
 - d. none of the above
9. When the attitude sensing element detects a change in attitude
 - a. the flux in both outer limbs of E core will increase
 - b. the flux in both outer limbs of E - core will decrease
 - c. the flux in one outer limb of E core will increase,
 - d. while the flux in other decrease *
10. A torque synchro system is comprised of
 - a. transmitter unit
 - b. receiver unit
 - c. a transmitter and a receiver unit *
 - d. none of the above
11. Transmitter and receiver of a torque synchro system consists of a rotor carrying a winding and concentrically mounted in a stator carrying three windings the axes of which are _____
 - a. 30° apart
 - b. 60° depart
 - c. 90° apart
 - d. 120° apart *
12. Which of the following statement is correct
 - a. the rotor of transmitter (Tx) and receiver (Rx) of a torque synchro system are free to rotate
 - b. the rotor of transmitter and receiver of a torque synchro system are mechanically coupled to an input shaft
 - c. the rotor of the transmitter of a torque synchro system is mechanically coupled to an input shaft, while the receiver rotor is free to rotate *
 - d. none of the above
13. The rotor windings of a torque synchro system are connected to a source of _____
 - a. three phase alternating supply
 - b. direct supply
 - c. two phase alternating supply
 - d. single phase alternating supply *
14. The synchros, used for transmission of angular position information by means of induced signal are _____
 - a. control synchros
 - b. torque synchros *
 - c. deferential synchros
 - d. resolver synchros
15. The function of which synchros is to produce an error voltage signal in the receiving element, as opposed to the production of a rotor torque
 - a. control synchros *
 - b. torque synchros
 - c. deferential synchros
 - d. resolver synchros
16. The function of _____ synchros is to convert alternating voltages, which represent the cartesian co - ordinates of a point into a shaft position and a voltage,

which together represent the polar co - ordinates of that point

- a. control synchros
- b. torque synchros
- c. deferential synchros
- d. resolver synchros *

17. Lift compensations circuit in a command signal section of AFCS is to correct the _____

- a. nose up tendency of an aircraft during turn
- b. nose down tendency of an aircraft during turn *
- c. nose level tendency of an aircraft
- d. none of the above



CHAPTER - 42

COMMAND SIGNAL PROCESSING

1. In connection with the command signal processing, the function of adapting control system response to an aircraft's handling qualities is known as
 - a. limiting
 - b. integrating
 - c. gain programming *
 - d. none of the above
2. In order to derive a DC control signal having the same phase relationship an a.c. error signal, it is necessary for signals to be
 - a. differentiated
 - b. demodulated *
 - c. modulated
 - d. synchronised
3. The process of converting those signals having an alternative wave form into signals of unidirectional wave form is called
 - a. gain programming
 - b. synchronizing
 - c. limiting
 - d. demodulation *
4. The process of preventing an automatic control system from applying excessive attitude change or harsh manoeuvring of any aircraft is called
 - a. limiting *
 - b. synchronising
 - c. modulating
 - d. demodulating
5. Scheduling is also called _____ in AFCS, command system processing
 - a. Scheduling
 - b. limiting
 - c. gain programming *
 - d. loss programming
6. Signals of analogue nature means
 - a. they are changing their value
 - b. they are continuously changing in value *
 - c. they are of fixed and predetermined value
 - d. none of the above
7. Binary notation means a system in which numbers are represented by the _____
 - a. digits from 0 - 9
 - b. digits from 1 to 9
 - c. two digits 0 and 1 *
 - d. none of the above
8. Binary digits 0 and 1 represent respectively
 - a. 'logic height' and 'logic low' values
 - b. 'logic low' and 'logic high' values *
 - c. 'logic low' and 'logic intermediate' values
 - d. none of the above
9. The devices used for signal conversion are of the solid state integrated logic circuit type, and are referred to as
 - a. analogue to - digital converters (A/D).*
 - b. digital to analog converters (A/D).
 - c. analogue to analogue convectors
 - d. digital to digital converters
10. DME in automatic flight control system refers to
 - a. Direction measuring equipment
 - b. drift measuring equipment
 - c. distance measuring equipment *
 - d. none of the above
11. 'LOC' and 'GS' modes in AF system refers to
 - a. lock and glide scope mode
 - b. local and gliding scope mode
 - c. localiser and glide slope mode *
 - d. localiser and ground speed mode
12. A demodulator is to be supplied with
 - a. an a.c. reference signal *
 - b. a d.c. reference signal
 - c. both a.c. and d.c. references signals
 - d. none of the above
13. a reference a.c. signal is supplied to the demodulator so that
 - a. The phase sense of the feed back signal can not be detected
 - b. The phase sense of the feed back signal may be detected *
 - c. The phase sense of the feed back signal becomes zero
 - d. none of the above.
14. With reference to computers, RAM stands for
 - a. Read all memory
 - b. Ready and march
 - c. Read Access memory
 - d. Random Access memory *
15. EP ROM stands for
 - a. Erasable portion Random of Memory
 - b. Erasible problem Read only Memory
 - c. Erasible programme Read only Memory *
 - d. none of the above.
16. DMA stand for (with reference to Computer)
 - a. Double Memory Access
 - b. Direct Memory Access *
 - c. Distance Memory Access
 - d. Down Memory Access.



CHAPTER - 43

OUTER LOOP CONTROL

1. The provision of raw data inputs relevant to a particular flight path is referred to as
 - a. capturing
 - b. coupling *
 - c. captaining
 - d. none of the above
2. The provision of raw data inputs relevant to a particular flight path is referred to as coupling or as a
 - a. 'hold' mode
 - b. 'mode of operation' *
 - c. 'lock' mode
 - d. none of the above
3. An aircraft flying automatically at a selected altitude is said to be in the
 - a. 'attitude mode' and height mode
 - b. 'altitude' or height capture mode
 - c. 'altitude hold' or 'height lock' mode *
 - d. none of the above
4. Manometric or air data are associated with
 - a. altitude
 - b. airspeed
 - c. vertical speed
 - d. all of the above *
5. Any changing of aircraft attitude about its pitch axis, while in straight and level flight, will be detected by _____
 - a. pitch attitude sensing elements of the AFCS *
 - b. roll attitude sensing element of AFCS
 - c. yaw attitude sensing element of AFCS
 - d. none of the above
6. To maintain a required altitude and to provide the automatic 'levelling off' at any desired altitude _____
 - a. an attitude hold or lock sensor is employed
 - b. an altitude hold or lock sensor is employed *
 - c. an air speed hold sensor is employed
 - d. none of the above
7. The altitude hold sensor consists of a pressure transducer comprising
 - a. an evacuated capsule assembly
 - b. E and I type of inductive pick off element, an amplifier
 - c. two phase induction type of chager motor
 - d. all of the above *
8. The capsule assembly of altitude hold sensor pressure transducer is subjected to changes of _____
 - a. Pitot pressure supplied to case of sensor unit
 - b. static pressure supplied to case of sensor unit *
 - c. pitot pressure supplied to diaphragm of sensor unit
 - d. none of the above
9. Capsule assembly of pressure transducer of altitude hold sensor is
 - a. mechanically linked to E bar coil of pick off element
 - b. electrically linked to I bar of pick off element
 - c. mechanically linked to I bar of pick off element *
 - d. electrically linked to E bar coil of pick off element
10. A change of altitude cause the capsule assembly to expand or close up, this displaces the _____
 - a. E bar and signal is induced in I bar
 - b. I bar and signal is induced in the outer coil of E bar
 - c. I bar and signal is induced in the coil of centre limb of E bar *
 - d. None of the above
11. An air speed sensor measures the
 - a. static pressure
 - b. pitot pressure
 - c. sum of static and pitot pressure
 - d. difference between static and dynamic pressure *
12. The capsule assembly of air speed sensor is
 - a. scaled
 - b. open to the source of static pressure
 - c. open to the source of dynamic pressure *
 - d. none of the above
13. In air speed sensor
 - a. dynamic pressure is given to capsule assembly and static to sealed chamber in which assembly is contained *
 - b. static pressure is given to capsule assy and dynamic pressure to sealed chamber in which assembly is contained
 - c. both pitot and static pressures are given to capsule
 - d. capsule is evacuated and sealed
14. An altitude sensor capsule assembly is
 - a. supplied with pitot pressure
 - b. evacuated *
 - c. supplied with static pressure
 - d. none of the above
15. Mach number varies with
 - a. altitude
 - b. air speed
 - c. altitude and airspeed *
 - d. none of the above
16. What source of air pressure are required for the operation of air speed and mach hold sensor units

- a. static pressure
b. dynamic pressure
c. static and dynamic pressure both *
d. none of the above
17. What does ADC means
a. air data controller
b. air data computer *
c. altitude data computer
d. attitude data computer
18. In ADC, sensing of pitot and static pressures is done by means of
a. flexible metal capsule elements
b. fixed metal pipes
c. flexible rubber tubes
d. piezoelectric crystal type sensors *
19. Inputs from an outside air temperature probe are supplied to the air data computers for the purpose of computing
a. SAT
b. TAT
c. TAS
d. SAT, TAT and TAS *
20. Inputs from outside air temperature probe are supplied to computer for computing SAT. Here SAT means
a. small air temperature
b. static air temperature *
c. straight air temperature
d. standard air temperature
21. Inputs from out side air temperature probe one supplied to computer for computing TAT. Here TAT means
a. true air temperature
b. total area temperature
c. total air temperature *
d. none of the above
22. In term of pressure ratio, mach no. is equivalent to :
a. P - S/P
b. S/P-S
c. P - S/S *
d. none of the above
23. Heading hold signals for an automatic flight control systems are supplied to the
a. yaw channel
b. roll channel *
c. pitch and roll channel
d. none of the above
24. Which mode is incorporated in AFCS system to enable the flight crew to select a perticular rate of climb as vertical speed, which on engagement, will be automatically maintained :
a. mach hold
b. air speed hold
c. altitude hold
d. vertical speed selection and hold *
25. In heading hold mode of operation the AFCS holds the aircraft on a
a. pre - selected west heading
b. desired and changing heading
c. pre selected magnetic heading *
d. none of the above
26. Turning of an aircraft is carried out by displacement of _____, so heading hold mode relates to control about _____ axis.
a. elevators, roll axis
b. flaps, pitch axis
c. ailerons, roll axis *
d. none of the above
27. In automatic flight control system, what does ILS stands for
a. Initial landing system
b. instrument landing system *
c. instrument looking system
d. instrument like system
28. An instrument landing system is a short range navigational aid which provides azimuth and vertical guidance during
a. take off
b. straight and level flight
c. the approach to an airport runway *
d. none of the above
29. The ground based elements of instrument landing system are / is _____
a. a localizer
b. a glide path transmitter
c. a marker beacons
d. all of the above *
30. The air borne element of instrument landing system are / is
a. a localisor signal receiving antenna
b. a glide path signal receiving antenna
c. an ILS receiver unit
d. all of the above *
31. The airborne element of instrument landing system are / is
a. marker beacon antenna and receiver
b. marker lights on the instrument panel
c. an indicator which shows whether the aircraft is on the correct approach
d. all of the above *
32. A glide path signal receiving antenna of ILS system is an
a. ground - based element
b. air borne element *
c. both a. and b. are correct
d. none of the above
33. An ILS receiver unit is
a. an air borne element of ILS *
b. a ground - based element of ILS
c. both a. and b. are correct
d. none of the above

34. In instrument landing system, the element which transmits runway azimuth approach information is ____
- glide path transmitter
 - marker beacons
 - a localiser *
 - none of the above
35. A glide path or glide slope, transmitter provides ____
- arimuth approach information
 - vertical approach information *
 - both vertical and asimolth approach information
 - none of the above
36. Marker beacons are ground based elements of ILS, which transmit _____
- runway asimuth approach information
 - vertical approach information
 - information on the distance to the runway thershold*
 - none of the above
37. The localiser element transmitter ILS is located
- at main instrument panel
 - at the far end of the runway *
 - at the sub instrument panel
 - none of the above
38. Localiser element transmitter is located at the far end of runway and transmits on a given frequency in the band
- 180.0 and 212 MHz
 - 80.0 and 120 MHz
 - 801.0 and 112 MHz
 - 108.0 and 112.0 MHz *
39. The signals transmitted by localiser transmitter to left of centre line has a
- 90 Hz signal superimposed on it *
 - 60 Hz signal suprimposed on it
 - 115 Hz signal suprimposed on it
 - 1150 Hz signal suprimposed on it
40. _____ signal is suprimposed on the signal transmitted by localiser transmitter to the right of centre line
- 90Hz
 - 60Hz
 - 1115Hz
 - 150 Hz *
41. In ILS while approaching, if the aircraft deviated to the left of the centre line, the strength of the
- 150 Hz signal will be greater than that of the 90 Hz signal
 - 115 Hz signal will be greater than that of the 90 Hz signal
 - 90 Hz signal will be greater than that of the 150 Hz signal *
 - 90 Hz signal will be lesser than that of the 150 Hz signal
42. In ILS, during approach, if aircraft deviates to a right of centre line ____
- 90 Hz signal is stronger than 90 Hz signal
 - 150 Hz signal is stronger than the 90 Hz signal *
 - 90 Hz signal is stronger than the 115 Hz signal
 - 60 Hz signal is stronger than the 150 Hz signal
43. Glide path element transmitter of ILS is located ____
- at for end of the runway
 - at the main instrument panel
 - at the sub instrument panel
 - near the threshold of the runway *
44. The transmitter (Glide Path element) is located near the treshold of the runway and transmits on a given frequency in the band
- 239.3 to 335.0 MHz
 - 329.3 to 335.0 MHz *
 - 329.3 to 535.0 MHz
 - 392.3 to 535.0 MHz
45. Glide path transmission of ILS provide vertical guidance above and below a descent path established at an angle of between
- 25° and 3°
 - 2.5° and 3° *
 - 12.5° and 12°
 - 13.5° and 14°
46. Marker beacon markers of ILS are located at
- for end of the runway
 - near threshold of runway
 - points along the runway approach path *
 - none of the above
47. Marker beacon transmitters are located at points along the runway approach path and their signals are beacons vertically with the descent path on a frequency of ____
- 60 MHz
 - 90 MHz
 - 1150 MHz
 - 75 MHz *
48. The _____ marker in ILS is situated approximately four nautical miles from the runway threshold
- inner
 - outer *
 - centre
 - none of the above
49. The outer marker of ILS is situated approximately from the runway threshold
- two nautical miles
 - four nautical miles *
 - six nautical miles
 - eight nautical miles
50. The _____ marker of ILS is sited approximately 3,500 ft from the threshold
- inner *
 - outer
 - centre
 - none of the above
51. Inner marker of ILS is sited approximately _____ from the threshold
- 5,300 feet
 - 5,300 meter
 - 3,500 meter
 - 3500 feet *
52. This system provides en-route information on the bearing of an aircraft from the points at which the stations are geographically located

- a. localiser system b. FDS system
c. VOR system * d. VHF system
53. The stations are spaced at interval of _____ with in what termed as the, airways system
a. 2 - 4 nautical miles b. 50 - 80 nautical miles *
c. 5 - 8 nautical miles d. 20 - 40 nautical miles
54. A VOR station stransmits a very high frequency (VHF) carrier wave operating in the _____
a. 108 - 118 MHz band * b. 18 - 118 MHz band
c. 8 - 18 MHz band d. 18 - 108 MHz band
55. Azimuth information during an ILS approach is provided by signals from
a. the golide slope transmitter
b. marker beacons
c. the localiser
d. none of the above *
56. The inertial theory is based on
a. Newton's first law b. Newton's second law *
c. Newton's third law d. none of the above
57. The force is equal to time rate of change of movemntum, without approximation or correction for any effect. This is called
a. Joule's law b. Charl's law
c. Newton's first law d. Newton's second law *
58. The rate of change of distance with time is called
a. acceleration b. distance
c. velocity * d. power
59. Acceleration is the rate of change of _____ with time.
a. velocity * b. distance
c. force d. acceleration
60. In INS, _____ accelerometers are mounted on inertial platform (for horizontal direction)
a. one b. two *
c. five d. four
61. During flight and approximately two minutes before a way point is reached, a light on the control panel comes on and then
a. remains on throughout flight
b. begins to flash on and off 30 minutes before the way point is erased
c. begins to flash on and off thirty second before the way point is reached *
d. none of the above
62. The ring laser gyro has
a. one rotor b. two rotors
c. no rotor * d. none of the above
63. The basis of a ring laser gyro is _____
a. rectangular black b. triangular block *
c. circular block d. conical block
64. The basis of a ring laser gyro is a triangular block of specially fabricated glass known as
a. concave glass b. hermit glass
c. convex glass d. cervit glass *
65. The basis of ring laser gyro is a triangular block of specially fabricated glass that it is extremely
a. soft and does not expand or contract with heating or cooling
b. hard and can expand and contract with heating
c. hard and does not expand or contract with heating or cooling *
d. none of the above
66. Purpose of control wheel steering mode in AFS system is to enable the pilot to manoeure his aircraft in
a. pitch and roll * b. roll and yaw
c. pitch and yaw d. none of the above
67. In AFC system, CWS mode means :
a. central wheel selection mode
b. control wheel steering mode *
c. control wheel selection mode
d. crucial wheel steering mode
68. VOR stands for
a. vertical omni directional range
b. variable outer frequency range
c. variable over frequency range
d. very high frequency omni directional range *
69. Touch control steering (TCS) permits a pilot to manoeuvre his aircraft in
a. roll and yaw b. pitch and roll
c. pitch and yaw * d. none of the above
-

CHAPTER - 44

CONVERSION OF COMMAND SIGNALS TO POWERED CONTROL

1. A series connected servo actuator is one which moves the
 - a. pilot's control
 - b. flight control surfaces and pilot's controls
 - c. flight control surfaces without moving the Pilot's controls *
 - d. none of the above
2. A parallel connected servo actuator moves the
 - a. control surfaces only
 - b. pilot's controls only
 - c. flight control surfaces without moving pilot's controls
 - d. both the appropriate flight control surfaces and the pilot's controls *
3. The Servo actuators operate on _
 - a. electropneumatic principle only
 - b. electromechanical principle only
 - c. either electropneumatic, electromechanical, or electrohydraulic principles *
 - d. none of the above
4. A DC operated servo actuator consist of a motor which is coupled to the flight control system via
 - a. an electromagnetic clutch
 - b. a gear train
 - c. a sprocket and chain
 - d. all of the above *
5. A two phase induction motor type of servo actuator has its reference phase constantly supplied with _____
 - a. 24 VDC
 - b. 24 V AC
 - c. 115 Volt 400 Hz *
 - d. 240 Volt 400 Hz
6. In primary flight control systems of the hydraulic power operated type, following are / is the component / components of control unit
 - a. select valve
 - b. spool valve
 - c. transfer valve
 - d. all of the above *
7. Which of the following is not a principle component of the control unit directly associated with automatic control
 - a. solenoid actuator
 - b. engage mechanism
 - c. LVDT position transducer
 - d. LOC *
8. LVDT stand for
 - a. Low voltage digital transformer
 - b. Linear voltage differential transformer *
 - c. Linear voltage digital transmitter
 - d. none of the above
9. EHSV stand for
 - a. electro hydraulic servo valve *
 - b. electro hydraulic standard value
 - c. Electro hydraulic service value
 - d. none of these
10. When the flaps of an aircraft are operated there is a inevitably a change in
 - a. roll attitude
 - b. pitch attitude *
 - c. Yaw attitude
 - d. none of these
11. All aircraft, particularly those having a swept wing configuration, are subject to a yawing rolling oscillation popularly known as _____
 - a. "Duck Roll"
 - b. "Duck Pitch"
 - c. "Dutch Roll" *
 - d. "Dutch Pitch"
12. In aircraft that are subject to the effect known as _____ the pitch attitude change arising is compensated as a function of mech no. by mech trim system
 - a. truck -over
 - b. truck - under
 - c. tuck - under *
 - d. tuck - over



CHAPTER - 45

AUTOMATIC CONTROL OF HELICOPTERS

1. Those helicopters which have complex AFCS and auto pilots, the force trim button and beeper trim switch are fitted on
 - a. collective pitch lever
 - b. cyclic pitch lever *
 - c. pedals
 - d. instrument panel
2. In combined system operation of series and parallel actuators, when the series actuator approaches the limits of its authority, then cockpit controls are moved to re - centre the series actuator by
 - a. captain of the aircraft
 - b. parallel actuator *
 - c. either parallel actuator or captain of aircraft
 - d. re - centering takes place automatically
3. The ability of an stability augmentation system to provide a long term attitude hold will largely be determined by
 - a. the sensitivity of rate gyro
 - b. the time constant of the leaky integrator
 - c. both a. and b. *
 - d. none of the above
4. To remove forces in the cyclic (and pedals) while these are moved to a new position is performed by pressing a single button on the cyclic stick is
 - a. 4 - way trim switch
 - b. beeper trim switch
 - c. force trim button *
 - d. PTT switch
5. When force trim button is pressed and cyclic is moved to new position and again force trim button is released then the force gradients of cyclic are re - established with the
 - a. old location as the zero force point
 - b. new location as the zero force point *
 - c. means of angles cyclic move from old to new location
 - d. remain at new location and return to old location after predetermined time period
6. Artificial feel system used in helicopter is based on
 - a. a pitot - static capsule type sensing element
 - b. a below type sensing element
 - c. springs, clutches and trim motors *
 - d. any one of the above can be used
7. Series actuators used in AFCS of helicopter, the actuator moves the
 - a. control surfaces, but not the cockpit control
 - b. control surfaces and cockpit control
 - c. cockpit control and not the control surfaces, if artificial feel system is turned off
 - d. both a. and c.*
8. When helicopter cockpit control is moved, using series actuator
 - a. the cylinder of the actuator will move while the output shaft remains stationary *
 - b. output shaft moves while cylinder of the actuator remains stationary
 - c. cylinder and output shaft both moves in same direction
 - d. cylinder and output shaft moves opposite to each other
9. The characteristics of a parallel actuator system is that the actuator moves
 - a. the cockpit controls and not the control surfaces
 - b. the cockpit controls as well as the control surfaces*
 - c. the control surfaces and not the cockpit controls
 - d. if the clutch is disconnected the actuator does not move the control surface
10. AFCS in helicopter using stability augmentation system (SAS), when the control stick is moved to command a new flight condition
 - a. the stick position pick off disconnect the signal from the rate gyro to the leaky integrator
 - b. a rate sensing switch in series with the stick position pick off opens
 - c. opened rate sensing switch prevents the rate signal from going to leaky integrator
 - d. all the above are correct *
11. Stability augmentation system which provide corrective control inputs proportional to the rate of change of attitude is sensed by the rate gyroscope, but the signal from it are integrated to simulate a datum signal, using
 - a. linear variable displacement transducer
 - b. leaky integrator *
 - c. symbol generator
 - d. tachnogenerator
12. In SAS rate gyro sends a signal to the computer
 - a. directly
 - b. through leaky integrator
 - c. directly as well as through leaky integrator *
 - d. as a negative feed back
13. If pilot want to establish new datum attitude, he should reposition the stick by pressing

- a. force trim button b. beeper trim switch
c. PTT switch d. either a. or b.*
14. Under which system pilot senses a crisp response
a. stability augmentation system
b. attitude - based stabilisation system
c. stability and control augmentation system *
d. all the above
15. In attitude - based stabilisation systems any change in a/c datum attitude is sensed by
a. rate gyro
b. directional gyro
c. vertical gyro *
d. tied gyro
16. In SAS any change in a/c datum attitude is sensed by
a. tied gyro b. earth gyro
c. rate gyro * d. vertical gyro
17. In helicopter autopilot system, altitude holds use signals derived from
a. radar altimeter
b. radio altimeter
c. barometric capsule *
d. vertical accelerometer
18. To smooth and shape the vertical response of the height hold channel can use
a. vertical accelerometer *
b. radar altimeter
c. barometric capsule
d. any one of the above
19. In Helicopter air speed hold is provided through the
a. collective pitch
b. longitudinal cyclic in forward flight *
c. lateral cyclic control
d. air speed indicator
20. In advance type of AFCS in the A/S. mode, the pilot is able to adjust the commanded airspeed by use of the
a. force trim button on cyclic
b. beeper trim switch on collection pitch
c. beeper trim switch on the cyclic *
d. force trim button on collective pitch
21. The airspeed hold (A/S) mode is controlled by the longitudinal cyclic channel, so it is not possible to also engage at the same time
a. altitude hold (ALT)
b. vertical speed hold (V/S)
c. heading hold (HDG)
d. altitude hold (ALT) or vertical speed (V/S) mode *
22. If it is desired to change altitude, then ALT mode must be disabled, either by selecting
a. A/S mode
b. V/S mode
c. de - selecting hold ALT mode
d. any of the a., b. and c.*
23. If helicopter is driven below the commanded altitude by a gust AFCS will attempt to correct the altitude by
a. raising the nose *
b. lowering the nose
c. accelerating vertically upward
d. increasing the speed
24. If helicopter is operating above minimum power speed, raising the nose will
a. decrease the airspeed
b. climb the helicopter
c. descent the helicopter
d. both a. and b.*
25. At a critical time while hovering and during transition to the hover and back to the forward flight airspeed of helicopter goes below 40 knots, at the time lack of information from pitot static system is replaced by
a. doppler sensor to provide groundspeed
b. barometric capsule to provide height above the surface
c. radar altimeter to provide height above the surface
d. both a. and c.*
26. At an appropriate location prior to the desired hover point, the pilot select on AFCS control panel
a. transition up mode (T. UP)
b. hover mode (HOV)
c. transition down mode (T. DWN) *
d. Groundspeed mode (GSP)
27. Helicopter using AFCS, as the T. DWN mode is selected and the airspeed falls below a certain pre - set value the
a. yaw channel converts from balanced flight to heading hold mode
b. roll and pitch channels change from bank angle hold and airspeed hold to lateral and longitudinal groundspeed programs
c. pilot is forced to land
d. both a. and b.*
28. Helicopter flying with AFCS, height hold use the signal derived from
a. radar altimeter *
b. barometric capsule
c. vertical accelerometer
d. all the above



CHAPTER - 46

FLIGHT DIRECTOR SYSTEM

1. In ADI horizon bar is carried on a flexible tape which is driven by pitch and roll servomotors having freedom of tape movement
 - a. $\pm 90^\circ$ in pitch and 360° in roll *
 - b. 360° in pitch $\pm 90^\circ$ in roll
 - c. $+ 90^\circ$ in pitch and -90° in roll
 - d. ± 90 in pitch and $\pm 60^\circ$ in roll
2. In attitude direction indicator (ADI), the upper and lower sections of the tape are coloured to represent the
 - a. upper and lower pitch angle from zero reference
 - b. sky and ground respectively *
 - c. it is only a background display of indicator
 - d. none of the above
3. Pitch and roll servomotors of ADI are supplied with signals from remotely located
 - a. vertical gyro *
 - b. directional gyro
 - c. VG and DG both
 - d. either VG or DG
4. Deviation from ILS glide slope beam are shown by
 - a. horizontal displacements of a pointer over a scale at the lower part of indicator
 - b. vertical displacements of a pointer over a scale at the left hand side of the indicator *
 - c. movement of sky tape over a fixed scale at the top of indicator
 - d. a digital display of pitch angle at the right hand side of the indicator
5. Indication of slip and skid are provided by an inclinometer fitted at the
 - a. lower side of HSI
 - b. upper side of ADI
 - c. lower side of ADI *
 - d. upper side of HSI
6. The pilot selects the go - around mode by pressing a button switch on the control wheel, the selection being indicated by the
 - a. illumination of an annunciator light marked 'GA'
 - b. displacement of the command bars
 - c. both a. and b. are correct *
 - d. none of the above
7. When operating in localiser mode initial movement of the lateral deviation bar in HSI begins when the a/c. is approximately
 - a. 4° from glide slope beam centre
 - b. $2\frac{1}{2}^\circ$ from localiser beam centre
 - c. 16° from radial centre
 - d. 4° from localiser beam centre *
8. When operating in VOR mode initial movement of deviation bar in HSI begins when the a/c. is approximately
 - a. 5° from radial centre
 - b. 16° from radial centre *
 - c. 10° from radial centre
 - d. 4° from radial centre
9. Deviation scale dots of HSI during localiser mode represent
 - a. 5° and 10° from radial centre
 - b. $1\frac{1}{2}^\circ$ and $2\frac{1}{4}^\circ$ from radial centre
 - c. $1\frac{1}{4}^\circ$ and $2\frac{1}{2}^\circ$ from radial centre *
 - d. 4° and 16° from radial centre
10. Pitch and roll information in EADI of EFIS is referenced against a shaded back ground represent the sky and ground in the colour respectively
 - a. red and black
 - b. cyan and yellow *
 - c. black and white
 - d. blue and white
11. A generator comprised of microprocessors, memories and the circuits necessary for generating the display of vital information in EFIS is called
 - a. synchronous generator
 - b. display generator
 - c. symbol generator *
 - d. both b. and c. are correct
12. EFIS display units utilise
 - a. colour cathode ray tubes *
 - b. black and white cathode ray tubes
 - c. either a. or b.
 - d. eastman colour cathode ray tubes
13. Third symbol generator is a 'standby' so that in the event that either of the two S. G. fail, its drive signals may be switched to the appropriate display units. This switching is done
 - a. by electromechanical relays
 - b. by selector switches
 - c. via electromechanical relays under the control of selector switches *
 - d. none of the above
14. During the approach the aircraft deviates beyond the normal ILSGS / LOC limits the flight crew are alerted by the respective deviation pointers
 - a. deflecting on deviation scale
 - b. changing colour from white to amber

- c. disappear from scale
d. changing colour from white to amber and also start flashing *
15. In EFIS, attitude direction indicator, radio altitude is digitally displayed during an approach, and when the a/c. is
a. below 1000 feet above ground level
b. 2500 and 1000 feet above ground level *
c. 2500 and 1000 feet above mean sea level
d. either a. or b.
16. In EFIS attitude director indicator, during approach the digitally displayed radio altitude goes below 1000 feet the display automatically changes to a
a. magenta circular scale calibrated in 100 foot increments
b. white circular scale calibrated in 100 foot increment*
c. umber colour circular scale calibrated in 10 ft increment
d. white circular scale calibrated in 10 ft increment
17. During approach when aircraft reaches below 1000 feet, digital display of selected decision height changes from a digital read out to a
a. white - coloured marker on the scale
b. amber - coloured marker on the scale
c. magenta - coloured marker on the scale *
d. red - coloured marker on the scale
18. As the a/c descends below 1000 feet, the circular scale indicating radio altitude, the segments of the circular scale are simultaneously "erased" so that the scale length is continuously decreased in
a. clockwise direction
b. anti - clockwise direction *
c. clockwise and anticlockwise direction simultaneously
d. none of the above
19. During approach when aircraft descends to preselected decision height (plus 50 feet) the colour of the circular height scale in EADI changes from white to
a. magenta b. red
c. amber * d. yellow
20. In EFIS horizontal situation indicator the symbol representing the aircraft is at the
a. upper part of the display
b. lower part of the display *
c. centre of the display
d. as pilot desires
21. If the flight crew wish to make any changes to the route, they first select them on the key board of the FMC display unit and check them in the screen of
a. EADI
b. EHSI *
c. either on EADI or EHSI
d. need not to check
22. When the temperature of EADI or EHSI varies from pre set value, the temperature is sensed by a temperature sensing unit and it transmits a signal to
a. instrument amplifier
b. flight management computer
c. symbol generator *
d. aural warning system
23. The temperature of EADI and EHSI are sensed by temperature sensing units which are set at low or high values. If the lower value is exceeded a signal is transmitted to symbol generator which causes the
a. restored data to be turned off *
b. stroked data to be turned off
c. whole display to be switched off
d. complete system to shut down
24. In order to ensure that the light intensity of the displays (EADI / EHSI) is compatible with ambient light conditions in the flight deck, the light sensors are used, which are of
a. light emitting diode type
b. photo sensing transistor type
c. photo diode type *
d. light triggering thyristors type
25. The pointers of glide slope and localiser meters of FDS indicators are driven by a
a. a.c. meter movement
b. d.c. meter movement *
c. mechanical movement
d. servo movement
26. The significance of the reference dots on the scales of glide slope and localiser meters is
a. centre of the runway
b. aircraft heading
c. beam centre line *
d. VOR radial
27. When the aircraft has descended to the pre - set radio altitude at which the decision whether to land or go around must be made is indicated by illuminating an annunciator light marked
a. MDA * b. GA
c. Either MDA or GA d. none o the above
28. When GA mode is selected and FDS is supplying guidance commands to an AFCS during an approach and pilot having automatic landing capability then the MDA system is
a. automatically disengaged
b. pilot simply ignore it
c. caused to disengage
d. if automatically not disengaged caused to disengage *
29. The go - around scale has several graduations ranging from the computed speed at the centre to
a. fast at bottom and slow at top
b. fast toward right and slow towards left

- c. fast toward left and slow towards right
 - d. fast at top and slow at bottom *
30. In order to achieve the correct go - around speed, engine power is adjusted so as to maintain the pointer at the
- a. centre of the scale *
 - b. top of the scale
 - b. bottom of the scale
 - d. out of the scale
31. The centre line of the selected localiser course of VOR radial is represented by
- a. course arrow
 - b. reciprocal course arrow
 - c. lateral deviation bar *
 - d. a/c. reference symbol
32. Selection of desired localiser course or VOR radial, is carried out by rotating the
- a. course selecting knob *
 - b. heading selecting knob
 - c. twining knob LOC / VOR frequency
 - d. all of the above
33. To which AFCS channels are FDS signals supplied
- a. roll channel
 - b. pitch channel
 - c. yaw channel
 - d. pitch and roll channel *
34. In some types of FDS arrangement is provided to permit the pilot to pre - select a fixed climb or descent command by
- a. pitch command facility *
 - b. height lock facility
 - c. GS/LOC facility
 - d. none of the above



CHAPTER - 47

AUTOMATIC LANDING AND AUTO THROTTLE SYSTEMS

1. An instrumentally derived value that represents the range at which high intensity lights can be seen in the direction of landing along the runway is called
 - a. decision height
 - b. runway visual ranges *
 - c. blind landing
 - d. weather minima
2. Wheel height above the runway threshold by which a go - around must be initiated by the pilot unless visual reference has been established is called
 - a. weather minima
 - b. RVR
 - c. decision height *
 - d. landing height
3. Minimum value of RVR and D. H. is
 - a. weather minima
 - b. LOW visibility landing *
 - c. landing height
 - d. none of the above
4. Operation down to minima of 200 ft DH and 800 meter RVR with a high probability of approach success is
 - a. cat - 3 c
 - b. cat - 1 *
 - c. cat - 2
 - d. cat - 3 A
5. Operation to and along the surface of the runway and taxiways without external visual reference is
 - a. cat - 1
 - b. cat - 2
 - c. cat - 3 c *
 - d. cat - 3 A
6. There are no weather conditions that can prevent an aircraft from landing and taking off successfully by means of automatic landing system under low weather minima is termed as
 - a. all weather operation *
 - b. minimum visibility operation
 - c. automatic landing operation
 - d. successful operation
7. Purpose and operation of devices designed to limit the authority of automatic control systems, in such system during approach the heights at which a control system is disengaged is
 - a. touch down height
 - b. break off height *
 - c. auto control height
 - d. necision height
8. Ability of a system to withstand a failure without endangering passenger safety, and without producing excessive deviations from the flight path is termed
 - a. fail soft
 - b. fail passive
 - c. fail active
 - d. both a. or b. *
9. A system in which one or more failure can occur, but leaves the overall system still functioning and without causing degradation of performance beyond the limits required for automatic landing is termed as
 - a. fail operational
 - b. fail active
 - c. fail survival
 - d. all of the above *
10. During landing decision height between 200 ft to 100 ft and runway visual range 800 meter to 400 meter with high probability of approach success is categorised as
 - a. cat - 3 A
 - b. cat - 2 *
 - c. cat - 3 C
 - d. cant - 1
11. During landing visibility is only sufficient for visual taxing comparable to RVR value in the order of 50 meter is categorised as
 - a. cat - 3 B *
 - b. cat - 3C
 - c. cat - 3 A
 - d. cat - 2
12. Automatic control system comprising of two or more sensible independent simplex systems and sub - channels used collectively is termed as
 - a. multiplex *
 - b. non - redundant
 - c. dual - dual
 - d. none of the above
13. A system of two complete systems or channels which are interconnected, and which together provide continuous control. If comparison monitoring is provided, a duplex system can provide fail operational capability is termed as
 - a. dual active with passive monitoring
 - b. duplex system
 - c. both a. and b. are correct *
 - d. none of the above
14. A system comprising two systems in parallel and with separate power supplies. The components of both are designed to be either self monitoring or to have their outputs checked by parallel comparator circuits is termed as
 - a. dual - dual
 - b. duplicate - monitored *
 - c. comparator monioitor
 - d. simplex monitor
15. The device which adjusts the amplitude of response of sub - system in multiplex systems to remove differences between sub - system outputs is known as
 - a. datum equaliser
 - b. gain equaliser *
 - c. comparator
 - d. monitor
16. The status of an automatic approach flare and landing sequence is displayed on indicator is of
 - a. digital display type
 - b. dual prismatic display type *
 - c. analog type
 - d. all the above are correct
17. The indicator used to display the automatic landing

- sequence status is of dual prismatic display type, the triangular shaped - prism of the indicator is actuated by
- electromagnetic coils *
 - permanent magnet
 - light sensing elements
 - none of the above
18. On autoland status annunciator one re - set and two test switches are provided to
- clear the lower display
 - rotate faces 'A' in to view
 - rotate faces 'B' into view
 - all the above are correct *
19. In multiplex automatic landing system during initial stage of approach, the control system operates as a
- double redundand system
 - single channel system *
 - triplex system
 - none of the above
20. In triplex automatic landing system at certain stage of approach remaining two channels are armed by
- pressing an 'APPR' switch on flight control panel*
 - pressing an 'ARM' switch on flight control panel
 - pressing re - set switch on autolan status annunciator
 - pressing 'GA' switch on control column
21. Pressing of "APPR" switch on flight control panel will arm the
- localiser mode
 - glide - slope mode
 - NOR mode
 - both a. and b. are correct *
22. Altitude information is essential for vertical guidance to touchdown is provided by a signal from
- barometric altimeter
 - radio altimeter *
 - vertical speed indicator
 - glide slope transmitter
23. Prior to touchdown the radio altimeter signal is effective within the operating range of
- 2000 feet
 - 2500 feet *
 - 1500 feet
 - at any one of the above
24. When an aircraft has descended to 1500 feet radio altitude
- only glide slope beams are captured
 - only localiser beams are captured
 - LOC / G stope beams are captured *
 - only radio altimeter signals are captured
25. When aircraft has descended below 1500 feet radio altimeter the control of aircraft about pitch and roll axes are done by
- V. G. and D. G.
 - inertial navigation unit
 - inertial reference unit
 - glide slope and localiser beam *
26. Under the automatic landing sequence when a/c reaches to 330 feet radio altitude the aircraft's horizontal stabilizer is automatically repositioned to begin retriming the aircraft to
- nose - down attitude
 - nose - up attitude
 - nose - up attitude and elevators are also deflected to counter the trime *
 - all the above are correct
27. The gear altitude calculation, which is preprogrammed in to the computer, is based upon
- radio altitude
 - pitch attitude
 - known distance between the landing gear, the fuselage and radio altimeter antenna
 - all the above *
28. The flase mode takes over pitch attitude control from the glide slope and generates a command to bring the aircraft on to a 2 feet / sec. descent path, the generated command is
- roll command
 - pitch command *
 - yaw command
 - autoland command
29. A command signal is supplied to the autothrottle system to reduce engine thrust is
- pitch command
 - roll command
 - throttle retard command *
 - touch down command
30. In autothrottle system the throttle position of each engine is controlled to maintain a specific value of thrust, in terms of
- rotational speed
 - engine pressure
 - target airspeed
 - any one of the above *
31. Go - around mode can be engaged when the autothrottle system is engaged and the radio altitude is less than
- 2500 feet
 - 1500 feet
 - 2000 feet *
 - 45 feet



CHAPTER - 48

FLY BY WIRE

1. Each pilot has a side stick type of controller apart from the control column due to a significant system provided is
 - a. EFIS
 - b. AFCS
 - c. FBW control system*
 - d. all of the above
2. Fly - by - wire control systems has a number of advantages over conventional control system such as
 - a. weight saving and fuel saving
 - b. reduce maintenance times
 - c. gust load alleviation
 - d. all the above are correct *
3. In FBW control system it is ensure that flight manoeuvre envelope limits of bank, pitch, yaw, speed, AOA and 'G' forces are not exceeded is termed as
 - a. improved handling
 - b. gust load alleviation
 - c. automatic manoeuvre envelope protection *
 - d. control laws
4. In advanced FBW control system the general layout of the components of an active control system (the number of computers, their functions, the manner of cross - voting) can be called its
 - a. control laws
 - b. architecture *
 - c. alternate
 - d. none of the above
5. In FBW control system the manner in which the computers are expected to create control surface and thus aircraft movement can be called
 - a. control law *
 - b. architecture
 - c. improved handling
 - d. gust load alleviation
6. Once pilot has demanded a steady flight - path, he should not need to make further inputs in order to retain that flight path, such control law comes under
 - a. 'g' demand / flight path hold *
 - b. pitch rate demand
 - c. c control law
 - d. none of the above
7. Under C control law in FBW system protection is provided against
 - a. over speeding
 - b. excessive angle of attack
 - c. excessive pitch angles
 - d. all the above are correct *
8. The A - 320 employs roll rate command with bank angle stability up to
 - a. 33° of bank *
 - b. 33° of pitch
 - c. 30° of bank
 - d. 15° of bank
9. Airbus A - 320 uses a form of
 - a. 'g' demand control law
 - b. pitch rate demand control law
 - c. the C control law *
 - d. none of the above
10. The control laws required for control in roll are
 - a. less complex than pitching plane
 - b. more complex than pitching plane
 - c. less complex than pitching plane at denote in concept
 - d. both a. and c. are correct *
11. In airbus the conventional control columns and yokes have been replaced by
 - a. control wheel
 - b. side sticks *
 - c. cyclic control
 - d. collective pitch
12. On airbus A - 320 a maximum force applied to side - mounted stick in roll
 - a. 3 daN *
 - b. 10 da N
 - c. 2 da N
 - d. none of the above
13. In A . 320 a maximum force of 10 da N is applied to sidestick in
 - a. pitch *
 - b. roll
 - c. yaw
 - d. all the above
14. On the sidestick pilots are able to apply a
 - a. greater force outwards than inwards
 - b. greater force inwards than outwards *
 - c. smaller force inwards than forwards
 - d. smaller force outwards than backwards
15. Fore / aft. axes of the centre sticks are angled
 - a. outboard
 - b. inboard *
 - c. sideways
 - d. none of the above
16. In ceptors in A - 320, including the thrust levers are not
 - a. back - driven by autopilot *
 - b. forward driven by autopilot
 - c. side driven by autopilot
 - d. both a. and b. are correct
17. Side sticks of both pilots are
 - a. interconnected
 - b. not interconnected *
 - c. interconnected by electromagnetic ditches
 - d. mechanically inter connected
18. In FBW pitch control system the rate of change of flight path is effectively normal acceleration and so it can be described as a

- a. 'g' demand system
 - b. flight path hold system
 - c. the 'c' control law
 - d. both a. and b. are correct *
19. In fly - by, wire control system THS stand for
- a. tailplane horizontal stabiliser
 - b. threshold supply
 - c. trimable horizontal stabiliser *
 - d. none of the above
20. In FBW system SEC stand for
- a. Spoiler / Elevator computers *
 - b. single alleviated computer
 - c. sinewave electrical comparator
 - d. none of the above
21. Lateral movement of the control wheels operated the position transducers, which is in the form of
- a. RVDT type * b. LVDT Type
 - c. ELAC Type d. SEC Type



CHAPTER - 49

A/C OXYGEN

1. With increase in altitude the pressure of the atmosphere and partial pressure of oxygen content
 - a. increases
 - b. decreases *
 - c. remain same
 - d. none of the above
2. Deficiency of oxygen in blood is known as
 - a. Amoxia
 - b. Aloxia
 - c. Anoxia *
 - d. all of above are correct
3. Maximum altitude without oxygen at which flying efficiency is not seriously impaired
 - a. 4000 ft
 - b. 6000 ft
 - c. 8000 ft *
 - d. 12000 ft
4. Maximum altitude at which sea level conditions can be maintained by breathing 100 percent oxygen
 - a. 8,000 ft
 - b. 25,000 ft
 - c. 33,000 ft *
 - d. 40,000 ft
5. For a 120 ltr capacity portable oxygen cylinder set, if flow rate selection is at height then which of following is correct
 - a. rate of flow is 2 ltr per minute.
 - b. rate of flow 4 ltr per minute.*
 - c. rate of flow 8 ltr per minute.
 - d. rate of flow 10 ltr per minute.
6. If rate selection is at "Emergency" in a 120 ltr cylinder set then rate of flow of oxygen is
 - a. 8 ltr per minute *
 - b. 10 ltr per minute
 - c. 8 ltr per hour.
 - d. 10 ltr per hour
7. If rate selection in a 120 ltr cylinder set is at normal, then rate of flow of oxygen is
 - a. 2 ltr per minute
 - b. 4 ltr per minute
 - c. 6 per per minute
 - d. 10 ltr per minute *
8. If selection is at "Normal" in 120 ltr oxygen portable set then cylinder will end for
 - a. 12 minutes
 - b. 30 minutes
 - c. 45 minutes *
 - d. 60 minutes
9. If selection is at "Heigh" in 120 ltr oxygen portable set then cylinder will go for
 - a. 12 minute *
 - b. 24 minute
 - c. 30 minute
 - d. 36 minute
10. Ifselection is at "Emergency" in 120 ltr oxygen portable set then cylinder will last for
 - a. 12 minutes
 - b. 30 minutes *
 - c. 60 minutes
 - d. 120 minutes
11. Oxygen cylinder are colour coaded for indentification purpose as
 - a. Black for main body and white for top hemispherical portion *
 - b. white for main body and black for top hemispherical portion
 - c. Green for main body and black for top hemispherical portion
 - d. None of the above
12. "Use No Oil" is written on oxygen cylinder
 - a. In white letter on a black background
 - b. In black letter on a white background
 - c. In white letters on red background
 - d. In red letter on white background *
13. Which statement is correct
 - a. Oxygen pipe line size are $\frac{3}{4}$ to $\frac{1}{16}$ inches out side diameter for high pressure pipes
 - b. Oxygen pipe line size is $\frac{5}{16}$ inch outside diameter for high pr pipe line
 - c. Oxygen pipe line size is $\frac{3}{16}$ and $\frac{1}{4}$ inch outside diameter for high pr. pipes *
 - d. oxygen pipe line size is $\frac{3}{16}$ and $\frac{1}{4}$ inch outside diameter for low pr. pipe.
14. Outside diameter for low pressure oxygen pipes
 - a. $\frac{1}{16}$ inch
 - b. $\frac{3}{16}$ inch
 - c. $\frac{1}{4}$ inch
 - d. $\frac{5}{16}$ inch *
15. Type of coupling normally used for oxygen pipe joints are of standard
 - a. MIS
 - b. AIS
 - c. AGS *
 - d. MGS
16. Which statement is not correct
 - a. Oxygen it self does not burn
 - b. An oxygen fire depends on combination of oxygen, combustibile meterial and heat
 - c. Heat can be generated in an oxygen system by sudden compression
 - d. Ozone is not a variety of oxygen *
17. Presence of oxygen in atmosphere is

CHAPTER - 50

SATELLITE COMMUNICATION

1. Rocket launching station Thumba is in the state of
 - a. Andhra Pradesh
 - b. Orissa
 - c. Kerala *
 - d. Karanataka
2. India's first domestic geostationary satellite INSAT-1A was launched from
 - a. USSR
 - b. FRANCE
 - c. USA *
 - d. UK
3. Which was India's first three-axis stabilized geostationary communication satellite ?
 - a. Rohini
 - b. Aryabhata
 - c. Apple *
 - d. Bhaskara
4. Which satellite communication system does not have Doppler frequency shift
 - a. DOMSAT
 - b. MARISAT
 - c. COMSAT
 - d. Geostationary Satellite*
5. In a communication satellite if the beamwidth required for national coverage is 1° , then the beam width required for full global coverage may be around
 - a. 360°
 - b. 180°
 - c. 72°
 - d. 18° *
6. The first Indian satellite Aryabhata was launched in the year
 - a. 1972
 - b. 1975 *
 - c. 1978
 - d. 1980
7. The second Indian satellite-Bhaskara was launched in the year
 - a. 1975
 - b. 1976
 - c. 1979 *
 - d. 1982
8. India's first experiment geostationary communication satellite, APPLE was launched in the year
 - a. 1981 *
 - b. 1983
 - c. 1985
 - d. 1986
9. INSAT-1 B was launched in the year
 - a. 1981
 - b. 1982
 - c. 1983 *
 - d. 1984
10. Satellites BHASKARA and ARYABHARTTA launched by India were mainly meant for
 - a. TV transmission
 - b. Radio transmission
 - c. Telephone systems
 - d. Meterological purposes *
11. Typical band of frequencies allotted for communication is
 - a. 500 KHz
 - b. 50 MHz
 - c. 500 MHz *
 - d. 500 GHz
12. For North India, satellite earth station is located at
 - a. Delhi
 - b. Kanpur
 - c. Srinagar
 - d. Dehradun *
13. Main satellite tracking station of India is located at
 - a. Delhi
 - b. Bhopal
 - c. Ahmedabad *
 - d. Kanpur
14. Satellite earth station that handles the traffic of southern and western regions is located at
 - a. Pune *
 - b. Bhopal
 - c. Nagpur
 - d. Vijaywada
15. In India rocket launching facilities exist at
 - a. Bangalore
 - b. Hyderabad
 - c. Avadi
 - d. Thumba *
16. With reference to satellite communication, the anti-jamming technique preferred is
 - a. Key leverage
 - b. Frequency hopping *
 - c. Once-only key
 - d. Frequency-spectrum modulation
17. MODEM is
 - a. a circuit which carries out modulation and demodulation of a carrier frequency *
 - b. an automatic repeat request a device for correcting errors
 - c. a system for transmitting high speed bursts
 - d. antijamming technique invariably installed on all communication satellites.
18. DAMA stands for
 - a. Data Accessibility Master Aerial
 - b. Digital Attenuators Microwave Antenna
 - c. Dual accessibility Mode Antenna
 - d. Demand Assigned Multiple Access *
19. PCM system is used in satellite communications for transmission of
 - a. TV signal
 - b. Telegraph signals
 - c. Speech signals *
 - d. All of the above
20. TDMA stands for
 - a. Target Domain Modulation Antenna
 - b. Time Division Multiple Access *
 - c. Transistorized Detector Muting Antenna
 - d. Transit Delay Manipulation Aerial
21. An antenna can be made more directional by
 - a. increasing its diameter

- b. increasing frequency of transmission
c. either of (a) or (b) above *
d. none of the above
22. In satellite communication
a. amplitude modulation is used
b. frequency modulation is used *
c. pulse width modulation is used
d. pulse amplitude modulation is used
23. FM is preferred for satellite communication because
a. satellite channel has large band width and severe noise *
b. it gives high modulation index
c. low bandwidth is essentially required
d. other methods of modulation will result in fading and distortion
24. FDMA stands for
a. Fading Deemphasis Microwave Amplifier
b. Flap Diffraction Magnetic Altimeter
c. Frequency Division Multiple Access *
d. Ferrite Digital Modulation Applegate.
25. To permit the selection of 1 out of 16 equiprobable events, the number of bits required is
a. 2
b. 4 *
c. $\log_e 16$
d. $\log_{10} 16$
26. As on-line, real time data transmission system is most likely to require a connection that is
a. time-shared
b. frequency shared
c. simplex
d. duplex *
27. ARQ stands for
a. Accelerated Redirection Facility
b. Amplitude Ratio detector Quantizing noise
c. Automatic Repeat Request *
d. Aerial Range Quartz crystal
28. For global communication, the minimum number of satellites needed is
a. one
b. three *
c. seven
d. eleven
29. the frequency band used by most satellites is
a. UHF
b. VHF
c. SHF *
d. EHF
30. The total noise of a satellite earth station receiving system consists of
a. Sky noise
b. Antenna and feeder noise
c. Parametric amplifier noise
d. All of the above *
31. The optimum working frequency for satellite systems lies between
a. 20 MHz and 100 MHz
b. 2 GHz and 12 GHz *
c. 20 GHz and 100 GHz
d. 100 GHz and 200 GHz
32. Compander
a. gives a poor ratio of signal strength to quantizing error, for weaker signals
b. gives preferential treatment to stronger parts of the signal
c. compresses the higher amplitude parts of a signal before modulation and expands them back to normal again after demodulation *
d. none of the above
33. In TV broadcast via satellite the TV signal from the main broadcast station is routed to the earth station via
a. low power transmitters
b. microwave links
c. TV relay stations
d. microwave repeater stations *
34. A telephone communication link between two countries is established through a composite system using submarine cables and satellite when
a. two countries are far apart
b. political links between two countries have been served
c. two countries are not facing common satellite *
d. two countries are not different continents.
35. A synchronous satellite orbits the earth once in
a. 24 hours *
b. 12 hours
c. 6 hours
d. 1 hour
36. The velocity of a geostationary satellite is nearly
a. 1255 km/hr
b. 6757 km/hr
c. 9422 km/hr *
d. 12644 km/hr
37. A polar satellite
a. has lower band width
b. requires higher launcher capability
c. has considerable Doppler shift *
d. has higher transmission delay
38. In a satellite system
a. upward link frequency is half of the downward link frequency
b. upward link frequency is greater than that of downward link frequency *
c. upward link frequency is lesser than that of downward link frequency
d. upward link frequency is equal to downward link frequency.
39. DC power required for satellite is derived from
a. solar cells and nickel-cadmium cells *
b. power supplies
c. fuel cells
d. none of the above
40. A geostationary satellite
a. remains stationary in space
b. remains at a height of 1000 km above the surface of earth

- c. orbits the earth with 24 hour period *
 d. remains always in a direction opposite to that of sun, with respect of earth.
41. Geostationary satellites are located at a height of
 a. 3600 km from earth's surface
 b. 36000 km from earth's surface *
 c. 360,000 km from earth's surface
 d. 3600,000 km from earth's surface
42. Geostationary satellites follow
 a. circular path b. elliptical path *
 c. inclined path d. cycloidal path
43. Geostationary satellites are generally put in orbit and domestic satellites in orbit
 a. polar, inclined orbit b. polar, equatorial
 c. equatorial, polar * d. inclined orbit, polar
44. Which area is least effectively covered by geostationary satellites ?
 a. Equatorial region
 b. Polar region *
 c. both (a) and (b) above
 d. none of the above
45. Satellites used for intercontinental communications are known as
 a. COMSAT b. DOMSAT
 c. INTELSAT * d. EARSAT
46. Satellite used for ship to shore and shore to ship communications for voice, data and telegraphy are known as
 a. COMSAT b. DOMSAT
 c. INTELSAT d. MARISAT *
47. A satellite earth station has
 a. receiving facilities only
 b. transmitting facilities only
 c. both transmitting as well as receiving facilities *
 d. transmitting, receiving and attenuating facilities
48. In satellite communication system, satellite receives signals from
 a. microwave repeater stations
 b. TV relay station
 c. appropriate earth station *
 d. all of the above
49. The main advantage of satellite communication system is
 a. low cost b. low distortion
 c. high reliability * d. high band width
50. A communication satellite is a repeater between
 a. a transmitting station and a receiving station
 b. a transmitting station and many receiving stations
 c. many transmitting stations and one receiving stations.
- d. many transmitting stations and many receiving stations.*
51. The angle subtended by earth at a geostationary communication satellite is nearly
 a. 66.5° b. 47.34°
 c. 17.34° * d. 7.34°
52. In analog technique of modulation in satellite systems, the most commonly employed system is
 a. AM b. FM *
 c. PAM d. PWM
53. Which is the most commonly employed modulation technique in commercial communication satellite systems ?
 a. FM technique
 b. Digital modulation technique
 c. Analog modulation technique *
 d. All of the above
54. Master control facility for INSAT-IB is located at
 a. Bangalore b. Dehradun
 c. Hasan * d. Nagpur
55. The transmission bandwidth for satellite system least depends on
 a. modulation method
 b. overall costs
 c. available technology
 d. ionospheric characteristics *
56. In satellite communication Farady rotation
 a. takes into account the difference in spin speeds of earth and satellite
 b. takes into account the difference arising due to presence of gravity on earth and absence of the same on the satellite
 c. occurs due to refraction that occurs in the ionosphere due to presence of magnetic field of earth *
 d. takes care of the rotation of earth and satellite on their respective axes.
57. A certain sound has 1000 times more energy than another sound. The number of times it would sound stronger to a listener will be
 a. 1000 b. 100
 c. 30 * d. 3
58. First Indian operational satellite was
 a. APPLE b. INSAT *
 c. ATS-6 d. ROHINI
59. Which satellite was used for SITE ?
 a. INSAT b. APPLE
 c. BHASKARA d. ATS-6 *
60. Satellite used for international communication are
 a. MARISAT b. COMSAT
 c. DOMSAT d. INTELSAT *

61. A satellite earth station has
 a. receiving equipment only
 b. transmitting equipment only
 c. both receiving and transmitting equipment *
 d. none of the above
62. Shanon's law relates
 a. antenna gain to bandwidth
 b. frequency to antenna only
 c. antenna gain to transmission losses
 d. information carrying capacity to S/N ratio.*
63. The orbital period of a satellite is proportional to (r is radius of circular orbit)
 a. r
 b. \sqrt{r}
 c. $r^{3/2}$ *
 d. r^2
64. Primary source of power for satellite is
 a. lead acid battery
 b. nickel-cadmium battery
 c. solar cells *
 d. regulated power supplies
65. The INSAT-1 B operates in
 a. S-band
 b. C-band *
 c. Q-band
 d. X-band
66. INSAT-1 B is being used for all of the following except
 a. Telecasting
 b. Meteorology
 c. Telecommunication
 d. Military Information System *
67. A 20 metre antenna gives a certain up-link gain at 5 GHz. For getting the same gain at 25 GHz, the antenna size required will be
 a. 100m
 b. 80m
 c. 20m
 d. 4 m *
68. Which antenna is used for sending back signals from satellite to earth ?
 a. Dipole antenna
 b. Horn antenna *
 c. Yagi antenna
 d. Chicken-mesh antenna
69. The signal to noise ratio for a satellite signal least depends on
 a. satellite surface area *
 b. bandwidth
 c. free-space path losses
 d. effective isotropically radiated power
70. In a communication satellite, the telephone channels are assembled in
 a. AM
 b. FM
 c. TDM
 d. FDM *



CHAPTER - 51

MIXED QUESTIONS ON AIRCRAFT INSTRUMENTS

1. Material used for making capsule and diaphragm of a/c instruments
 - a. phospher bronze
 - b. beryllium copper
 - c. either a. or b. *
 - d. a. and b. both
2. Material for strong and sensitive of diaphragms is
 - a. copper
 - b. bronze
 - c. copper and bronze
 - d. beryllium copper *
3. Bellows used to measure the pressure operated instruments ranges
 - a. up to 20 mm of water
 - b. as low as 20 mm of water
 - c. 200 PSI *
 - d. none of the above.
4. To increase the sensitivity some of ROCI consists of a capsule formed of two diaphragms:- which may have thickness of
 - a. 0.002 inch *
 - b. 0.005 inch
 - c. 0.004 inch
 - d. either b or c
5. Characteristics of capsules and diaphragms vary with
 - a. thickness of material
 - b. area of capsule or diaphragm
 - c. type of material
 - d. all of the above *
6. Main object of forming number of corrugations in diaphragm is
 - a. for the flexibility
 - b. to increase the surface area
 - c. for more linear pressure deflection *
 - d. all the above are correct
7. An altimeter capsule may be formed of two diaphragms and then evacuated to a pressure of about 0.05 mm of Hg and sealed off and prevented to collapse
 - a. by the spring tension of the capsule *
 - b. coiled spring inside
 - c. leaf spring inside
 - d. all of the above are correct
8. In sensitive ROCI capillary tube is used to give convey the static pressure main aim of this tube is
 - a. for damping the static pressure
 - b. it prevents pressure surges reaching the capsule *
 - c. used for temperature compensations
 - d. none of the above
9. A voltmeter for use on a d.c circuit employ coil element having low resistance itself for full scale deflection. For higher range deflection or indication resistance to be connected
 - a. high value limiting resistance in series *
 - b. low value resistance in parallel
 - c. one in series and other in parallel
 - d. all of the above are correct
10. In fuel low level pressure switches, lamp illuminates when,
 - a. fuel pressure drops below the predetermined value*
 - b. fuel pressure drops above the predetermined value
 - c. fuel pressure drops corresponding to height
 - d. all are wrong
11. Purpose of choke in the inlet of union is to safeguard the mechanism of bourdon tube in case of
 - a. pressure surges *
 - b. engine backfires
 - c. atmospheric pressure increases
 - d. none of the above
12. Manifold pressure gauge reads when engine is not running
 - a. day's prevailing pressure *
 - b. mean sea level pressure
 - c. days and mean sea level pressure
 - d. all are correct
13. Purpose of square law compensation mechanism in ASI is
 - a. to make the scale even *
 - b. to make the scale uneven
 - c. to read higher in low side of scale
 - d. all are wrong
14. Purpose of heating element in pitot head is to
 - a. prevent ice formation at higher altitudes *
 - b. avoid the ingress of dirt
 - c. prevent the entrance of insects
 - d. compensation of density error
15. Mach.meter indicates the mach.no which is the ratio of
 - a. true air speed to the speed of sound *
 - b. indicated airspeed to the speed of sound
 - c. indicated attitude to the speed of sound
 - d. all are correct
16. Critical mach no. is that position where
 - a. dangerous aerodynamics condition arises *
 - b. safe position of the aircraft
 - c. stall position of the aircraft
 - d. a. and c. both are correct

17. The type of instrument used to measure the temperature of CHT
 a. iron
 b. Ammeter
 c. millivoltmeter *
 d. milliammeter
18. Cross section area of bourdon tube pressure gauge is
 a. round
 b. square
 c. rectangular
 d. oval *
19. Purpose of hair spring on the pinion of pressure gauge is to
 a. to bring the pointer to off scale
 b. to remove the backlash
 c. both a. and b.*
 d. none of the above
20. Overload stop fitted above the force end of tube of pressure gauge is
 a. for safeguarding incase of excessive pr.
 b. for safeguarding in case of negative pr.
 c. for safety of mechanism incase of excessive pr.*
 d. none of the above
21. Mechanical type transmitting pressure gauges capillary tube forms the convenient purpose of
 a. transmitter
 b. indicator
 c. damping device *
 d. all are wrong
22. Altimeter with sensitive mechanism works on the principle of
 a. Boyle's law
 b. Charel's law
 c. aneroid *
 d. all the above correct
23. Bi-metallic strip linked to rocking shaft in altimeter is for
 a. rocking movement
 b. linear movement
 c. temperature compensation *
 d. both b. and c.
24. A sensitive altimeter consists of
 a. single capsule
 b. two capsules
 c. two or more capsules *
 d. all three correct
25. Mercury type mechanical thermometer, temperature compensations in capillary tube is achieved by
 a. running a fine invar wire in the length of capillary tube *
 b. a bi-mettallic outside the capillary tube
 c. covering with felt: out-side the capillaru tube
 d. none of the method is used.
26. Mechanical type fuel contents gauges are normally effected with
 a. position error *
 b. temperature error
 c. friction error
 d. all the three are correct
27. Hydrostatic fuel gauge is type of a
 a. bourdon tube type
 b. capillary tube
 c. a. and b.
 d. a. and b. effectively & differential gauge *
28. Hydrostatic fuel gauge reading is effected with
 a. volumetric error
 b. position error *
 c. temperature error
 d. none of the above
29. In two stage fuel cut off switch, switch cut off the supply to:
 a. fuel pump when tank is 1/3
 b. 1st stage s/w controls the refuelling pump when tank is nearly full
 c. 11rd stage s/w operates when tank is full with its normal capacity
 d. b. and c. both are correct *
30. In chronometric type RPM indicator, Escape mechanism operates a series of cams at a time cycle which is constant:-
 a. nearly 1 second *
 b. nearly 2 second
 c. nearly 3 second
 d. no time cycle is used
31. In directional Gyro axis of the spin of the rotor is
 a. horizontal axis *
 b. vertical axis
 c. both a. and b. as per position
 d. all are wrong
32. Purpose of erection mechanism is to keep the rotor axis of DG
 a. horizontal *
 b. vertical
 c. inclined
 d. none of the above
33. Air driven Gyro rotor is driven at the speed by means of two equally spaced air jets which are fitted on the
 a. inner gimble ring
 b. outer gimbal ring *
 c. case of the rotor
 d. none of the above
34. Gyro rotor runs at the full speed of, when pressure of $3\frac{1}{2}$ to 4 in of Hg.
 a. 22,000 rpm *
 b. 12,000 rpm
 c. 14,000 rpm
 d. none of the above
35. In artificial horizon rotor spins at the speed in
 a. horizontal axis to inner ring
 b. vertical axis to 90° inner ring *
 c. inclined axis to outer ring
 d. all are correct
36. Horizon bar is pivoted at rear with balance wheight:
 a. inner ring rear side
 b. outer ring front side
 c. inner ring front side
 d. outer ring rear side *
37. Purpose of erection system is to keep the Gyro axis vertical this is done
 a. two pair of pendulous values
 b. one pair of pendulous values
 c. one pair in pitch axis and one pair roll axis *
 d. two pair in roll and two pair in pitchaxis

38. Miniature aircraft in the centre of glass represents the
 a. front view of aircraft b. rear view of the aircraft*
 c. side view of the craft d. all are correct
39. Artificial horizon indicates the attitude of aircraft with reference to
 a. earth position * b. global position of a/c
 c. artificial position d. directional position
40. Purpose of damping device is to give in turn & slip indicator
 a. to produce scillation
 b. to give dead beat-reading *
 c. to make the pointer even
 d. all the above are correct
41. Damping device in TSI is incorporated and connected to:-
 a. inner ring b. outer ring
 c. pointer shaft * d. restrained spring
42. Desyn system is a remote indication system for the position and works on *
 a. d.c. synchronous system
 b. a.c. synchronous system
 c. autosyn synchronous system
 d. none of the above
43. Desyn Indicators are calibrated with:
 a. desyn master potentiometer *
 b. dead weight tester
 c. anglo meter tester
 d. both b. and c.
44. Aysynn remote indicator transmission system is incorporated in
 a. radio magnetic indicator
 b. radial magnetic selector
 c. compass system
 d. all the above are correct *
45. In differential control synchros transmitter and receiver follows the
 a. same angular displacement as receiver and transmitter
 b. transmitter out of phase to receiver
 c. angular displacement between transmitter to indicator equal to the angle between the rotor and stator of differential control *
 d. none of the above
46. RMI (Radio Magnetic Indicator) is a
 a. engine instrument
 b. navigational instrument *
 c. flight instrument
 d. attitude indicator
47. VOR (very High Frequency Omni Range) and ADF (Automatic Direction Finding) are having difference and advantage VOR is
 a. less interference *
 b. medium frequency range
 c. mega hertz frequency
 d. no difference at all
48. In RMI (Radio Magnetic Indicator) type of synchro or synchros used in
 a. synchro-control transformer *
 b. differential torque system
 c. differential control system
 d. none of the above
49. Intergrating flow meter make use of electrical transmission system
 a. dysyn synchronous system
 b. aysynn synchronous system *
 c. control transformer synchronous system
 d. all the three are wrong
50. Range of temperature measurement of CHT gauge is
 a. 0 - 350°C * b. 40 - 350°C
 c. 0 - 800°C d. -70 to +50°C
51. While setting ambient temperature on the indicator of CHT
 a. to be connected to system
 b. to be disconnected to system *
 c. to be connected to extension leads only
 d. to be disconnected to extension lead
52. For temperature compensation of cold junction method used in indicator is a
 a. Bi-metalhelix
 b. Bi-metalspiral
 c. both a. and b.*
 d. none of the above
53. CHT gauge system operates on supply of
 a. 12 volt d.c. b. 24volt d.c.
 c. 36 volt d.c. d. none of the above *
54. Material used for making CHT thermocouple is combination of
 a. copper-constant * b. chromal-alumel
 c. a. and b. both d. none of the above
55. Range of JPT gauge is
 a. 400 - 800°C * b. 0 - 350°C
 c. 0 - 400°C d. 0 - 800°C
56. JPT gauge have the provision of ambient temperature compensator
 a. thermomagnet sheet
 b. Bi-Metallic spiral
 c. a. and b. both
 d. none of the above *
57. Material used for manufacturing JPT thermocouple is combination of
 a. copper & constantan b. chromel - alumel *
 c. a. and b. both d. none of the above

58. In JPT cold junction compensator circuit used is
 a. series circuit
 b. parallel circuit
 c. a. and b. both
 d. wheat stone bridge circuit *
59. Voltage compensator of cold junction in JPT system is fed with
 a. 12 volt d.c. b. 24 volt d.c.
 c. 12 or 24 volt d.c.* d. not given any supply
60. Indicator used in JPT gauge is a conventional
 a. milliamper b. millivolt *
 c. hot iron d. ratio type volt meter
61. In resistance type thermometer resistance of element for sensing the temperature consists of
 a. copper wire b. brass wire
 c. nickel wire * d. chromium wire
62. The indicator used resistance type thermometers is a
 a. moving coil ratio type *
 b. hot iron type
 c. edision type
 d. none of the above.
63. In ratio meter moving coil input supply is 24 to 28 volt d.c. Variation of the supply will
 a. effect the indicator b. will not effect *
 c. may effect slightly d. none of the above
64. Range of resistance type thermometer for measuring the temperature is
 a. upto 200°C b. more than 200°C
 c. below 200°C * d. upto 350°C
65. Transmissions method utilized in ratio type electrical pressure gauges is
 a. desyn type *
 b. aysynn type
 c. differential sychronous type
 d. none of the above
66. Input supply to inductor type pressure gauges is
 a. 26volt d.c. b. 26v 400 c/s *
 c. 36volt 400 c/ d. 28v d.c.
67. Principle employed in inductor type pressure gauge transmitter is
 a. pressure changes impedance decreases
 b. pressure increases and inductor coil impedance increases *
 c. pressure decreases and inductor coil impedance increases
 d. none of the above
68. Indicator is unaffected by supply voltage changes in the coil
 a. measures the ratio of current in the coil *
 b. measure the ratio of voltage in the coil
 c. measure the ratio of resistance in the coil
 d. none of the above
69. To consider the temperature changes in system of inductor of a.c. type ratio meter
 a. a nickel wire resistance across two coils *
 b. a damping capacitor accross two coil
 c. two copper shading rings
 d. none of the above
70. Reading of d.c. generator RPM indicator moving coil type is
 a. not reliable
 b. very accurate
 c. change in permanent magnet effect the reading *
 d. none is correct
71. A.c. operated RPM indicator is more reliable than d.c. generator operated because
 a. voltage fluctuation is not effect *
 b. a.c. generator is single phase
 c. a.c. generator is two phase
 d. all are correct
72. In d.c. fed RPM indicator generator runs corresponding to engine RPM and indicator operates on
 a. permanent magnet
 b. two pale magnet
 c. permanent magnet and drug cup
 d. permanent magnet produces eddy current inside drug cup assly *
73. The hair spring in RPM indicator series provides
 a. controlling force
 b. driving force
 c. controlling force and bringing the pointer to off scale *
 d. all are correct
74. Rotor of RPM indicator motor in d.c. operated indicator is
 a. squirrel cage type *
 b. permanent magnet type
 c. moving coil type
 d. none of above
75. During the bench cheak of a.c. operated RPM indicator with stroboscope tester sometime essential to connect indicators with one generators
 a. two indicators in parellel *
 b. three indicator in parallel
 c. one RPM indicator only
 d. all are wrong
76. During the bench check of the RPM indicator operated by a.c. generator, indicator over reads remedial actions is
 a. eddy currents are varied by moving the drag cup assly
 b. the magnet strength is varied in drag cup assembly
 c. either a. or b. are correct
 d. a. and b. both are correct *

- a. turn error * b. bank error c. on or off d. not used at all
c. slip error d. a.,b. and c. are correct
96. In artificial horizon turn error is effected in the axis of
a. roll b. pitch
c. roll & pitch, both * d. roll pitch and yaw
97. In electric artificial horizon erection mechanism is consists of
a. two torque motor b. two mercury s/ws
c. two micro s/w d. a. and b. both *
98. In erection system two torque motor and two mercury switches which are controlling fitted in the
a. roll motor in pitch axis controlled by roll s/w *
b. pitch motor in roll axis controlled by pitch s/w
c. roll motor in roll axis controlled by pitch s/w
d. pitch motor in pitch axis controlled by roll s/w
99. Rotor motor is 3 phase supply and type of winding is
a. star * b. delta
c. star and delta d. none of the above
100. Mercury s/ws outer limbs are connected to the winding of respective torque motors
a. control windings * b. constant winding
c. delta windings d. star windings
101. Actuating pin to operate the horizon bar is fitted on the in electrical type artificial horizon.
a. inner gimbal ring * b. outer gimbal ring
c. case of instrument d. backside assembly
102. Purpose of turn and slip indicator (TSI) is to indicate the pilot
a. ratio of turn of a/c
b. correct bank
c. correct turn with correct bank
d. all a., b. and c. correct *
103. Purpose of governor s/w in TSI is to control the
a. under speed of the rotor
b. over speed of rotor *
c. to operate the power failure indicator
d. not used in the system
104. Over speeding (gyro) rator of TSI is controlled by
a. adding a resistance in series *
b. adding two resistance in series
c. deducting a resistance in parallel
d. none of the above
105. Copper drag cup assembly is used to have
a. controlling force on rotor
b. damping force on rotor
c. dead beat reading of pointer *
d. none of the above
106. Power failure indicator "off" appears when supply to TSI rotor is
a. on b. off *
107. Power failure indicator in TSI operates with supply and disappears when input supply is
a. off b. on *
c. any time can appear d. doesnot used
108. In TSI, Power failure indicator on the basis of in case of permanent magnet type
a. electromagnetic inductions
b. electromagnetic torque *
c. eddy current
d. none of the above
109. Capacitance type fuel contents gauges are having advantage of because they are free from
a. measurement error
b. attitude error
c. acceleration and deacceleration errors
d. a. and b. are correct *
110. Capitance type fuel contents gauge operates on
a. a.c. supply b. d.c. supply
c. a.c. and d.c. both * d. none of the above
111. Capacitance of capacitor depends on
a. size electrodes
b. material of dielectric -constant
c. supply input
d. a. and b. are correct *
112. Another advantage of capacitance type of fuel gauge is that it can be calibrated
a. in terms of mass * b. in terms of gallons
c. in terms of liters d. all the three are correct
113. Capacitance of capacitor is directly proportional to
a. area of electrodes
b. distance between plates
c. size of plates
d. all the three are correct *
114. To minimise the attitude errors, it is adviseable to have tank units in a tank
a. one tank unit b. two tank unit
c. two or more * d. none of the above
115. For summation of tanks capitance the units must be connected
a. in parallel *
b. series
c. half in series and half in parallel
d. all are wrong
116. Increase in temperature increases the volume of fuel which will effect
a. quantity b. volume
c. reading d. no change on reading *
117. The indicator is calibrated in terms of gallons or pounds for measuring fuel quantity which basically

- a. hot iron type b. capacitance meter
c. milli amper * d. milli volt meter
118. In smith way mouth capacitance fuel gauge indicators L1, L2, & L3 forms the circuit and oscillates
a. frequency depending on the values of inductance
b. frequency depending on the value of capacitance
c. as in a. and b.*
d. none of the above
119. A feed back circuit incorporated in amplifier circuits if smith's way mouth fuel contents gauge is
a. to compensate for voltage variations *
b. for fuel quantity change
c. to compensate for temperature changes
d. none of the above
120. Purpose of variometer is to vary the inductance of
a. L2 * b. L4
c. L1 d. L5
121. The pointer of indicator (SWM) fuel contents gauge covers an arc of about 270 deg and maximum and minimum scale marks correspond to
a. 2MA and 7 MA * b. 5 MA and 7 MA
c. 3 volt to 6 volt d. none of the above
122. Main types of tank units used in capacitance type fuel contents gauges are
a. channel type b. tubular type
c. flexible type d. all are correct *
123. The type of tank unit used in simmonds pacitor fuel contents gauge is
a. drop in type b. flexible type
c. channel type d. all are correct *
124. To provide a more comprehensive fuel gauging system components include unit in simmonds fuel contents gauge
a. level warning unit
b. cross-over switch
c. water detector probe
d. all a., b. and c. are correct *
125. The cross-over switch is used in the event of simmonds fuel contents gauge is
a. in emergency
b. failure of any part of system
c. a. and b. are correct *
d. all are wrong
126. Water detector probe is operated by a push button operated and indicates this presence by
a. supressing the appropriate indicator pointer
b. pointer to a below zero reading
c. both a. and b. are correct *
d. a., b. c. are wrong.
127. The indicator of simmonds fuel contents gauge is basically conventional a
- a. milli ampher b. milli-valt
c. milliamp ratio meter * d. hot iron ratio type
128. Low pressure gauges are tested with the help of a tester
a. u'tube manometer * b. dead wt. tester
c. both a. and b. d. a., b. and c. are wrong
129. High pressure gauges are tested with
a. dead weight tester *
b. low pressure mamometer
c. leak tester
d. a., b. and c. are correct
130. The tester used for high pressure gauge dead wt tester has a dual range 10-500 PSI, 100 - 5000 PSI it is possible to use both the ranges wt either side, because
a. piston on wt rests are different area
b. the weight carrier forms part of total load
c. low pressure side, the wt alone is equal to 10 PSI and high pressure side it is equal to 100 PSI
d. a., b. and c. are correct *
131. While testing oxygen pressure gauge it can be connected directly dead wt tester
a. provided pressure transmitter is fitted *
b. not mandatory to connect the pr. transmitter
c. coil is highly inflameable, used in tester
d. all a., b. and c. are correct
132. Pitot -static (Bryans type) leak tester have the choke which comes into operation during
a. pressure release b. suction release *
c. pressure applied d. not used at all
133. Purpose of choke which comes in operation during pitot-static test is for the safety of
a. air speed indicator b. ROCI *
c. altimeter d. all the pitot-static units
134. Purpose of movement calibrator in ROCI tester is
a. to measure the high pressure applied to capsule of ROCI
b. to measure the low pressure applied to ROCI capsule *
c. high pressure applied to orifice leak assembly
d. none of the above
135. Twin-cistern barometer have the advantage over one offset cistern barometer is
a. to obviate errors arises due to imperfect levelling *
b. to reduce the parallex error
c. either a. or b.
d. none of the above
136. Strobo scope type techmometer tester provision is made to connect a tuning fork:-purpose of fork is:
a. to establish frequency of light *
b. to change the voltage in transformer
c. a. and b. are correct
d. none of the above

137. In gyro test table provision is made to tilt the table to fixed angle during the test
- $7\frac{1}{2}$ deg maxi.
 - 15° deg maxi *
 - 10 deg mini
 - 3 deg mini
138. Speed of table is maintained constant by
- motor
 - variable speed unit *
 - clock mechanism
 - none of the above
139. Table can be set to automatic reversal speed by means of for every minute
- clock
 - selection s/w
 - auto and stand s/w
 - a., b. and c. are correct*
140. Gyro tester MK4A is used to test the types of gyro instruments
- 28v d.c.
 - 115v.400c/s a.c
 - pneumatic inst.
 - all a., b. and c. instruments *
141. Three adjustable handles are mounted beneath the turn table. Their positions of a, b, & c are marked. For setting table for Azimuth motion.
- release control handle 'A'
 - lock control 'B'
 - lock table in horizontal place
 - none is wrong *
142. Setting table for roll, pitch and yaw
- release handle 'B'
 - lock hand 'A'
 - lock table in horizontal plane
 - all are correct *
143. For setting gyro test table for erection and cardinal check
- lock table in horizontal plane
 - release handle 'B'
 - lock handle 'A'
 - all a., b. and c. are correct *
144. Rate of rotation of the gyro tester turn table may be varied by means of a control located on the LHS knob a/c test table, between the limits of
- 72 deg to 80 deg
 - 86 deg to 90 deg
 - 72 deg to 2,880 deg per minute *
 - all a., b. and c. are correct
145. In electrical thermometer test set thermometer bulb immersed in a hot bath which contains a master mercury thermometer. This method is however is not really practicable for electrical instruments for main reasons
- heating bath takes considerable time *
 - transmitter & indicator are connected together
 - either a. or b. are correct
 - both a. and b. are correct
146. With the pyrometer test set for checking thermo couple type of thermometer
- set can test complete installation
 - thermocouple alone
 - extension leads alone and indicator alone
 - all a., b. and c. are correct *
147. Two knobs A. AND B. located bottom panel of pyrometer test-set, knob 'B' is used in conjunction with the master indicator
- knob increases the resistance in step of 2 ohms per step up to 15 steps *
 - knob decreases the resistance in step 1 ohm
 - to increase the knob in ohms in step of 2 ohms
 - none of the above
148. Range of value of pyro test set is
- 2 ohms to 32 ohms *
 - 1 to 15 ohms
 - 0 to 10 ohms
 - all are wrong
149. One inch of mercury is equal to _____ mm. of Hg
- 13.60
 - 25.40 *
 - 2.54
 - None of above
150. One inch of H₂O is equal to how many pascals
- 249.089 *
 - 0.036
 - 2.54×10^{-3}
 - 13.60
151. One inch of Hg is equal to how many inches H₂O ?
- 2.54
 - 25.4
 - 33.8
 - 13.60 *
152. One atmosphere is equal to
- 1013.25 mB
 - 760 mm of Hg
 - 406.9" of H₂O
 - All of above are correct *
153. One inch of Hg is equal to how many millibars
- 33.86 *
 - 254
 - 2.54
 - 25.4
154. One inch of H₂O is equal to how many millibars
- 33.86
 - 2.54
 - 249.089
 - 2.490 *
155. One inch of H₂O is equal to how many PSI
- 0.03613 *
 - 0.07355
 - 2.4×10^{-3}
 - None of above
156. One kg per s cm is equal to _____ inches Hg
- 1.019
 - 13.60
 - 28.96 *
 - 0.00099
157. One kg per s cm is equal to _____ mm of Hg
- 28.96
 - 735.54 *
 - 2.490
 - None of above
158. One kg per s cm is equal to how many PSI
- 28.9
 - 14.223 *
 - 1.201
 - None of the above

189. One quart is equal to _____ litres
 a. 1.136 * b. 1.925
 c. 1.443 d. 1.993.
190. One US Gallon is equal to _____ litres
 a. 7.62 b. 3.785 *
 c. 5.57 d. None of above
191. One US Gallon is equal to _____ cubic inches
 a. 231.00 * b. 321.00
 c. 121.5 d. 99.3
192. One radian is equal to _____ degree
 a. 39.5 b. 78.2
 c. 57.3 * d. None of above
193. One quadrant is equal to _____ degree
 a. 180° b. 90° *
 c. 270° d. 360°
194. One litre is equal to _____ cubic cm
 a. 10³ b. 10⁴ *
 c. 10² d. 10
195. One radian is equal to _____ minute
 a. 3437.75 * b. 34.37
 c. 343.7 d. None of above
196. One radian per second is equal to _____ degree per second
 a. 60 b. 22/7
 c. 57.3 * d. 180
197. One cubic inch is equal to _____ cubic cm.
 a. 16.39 * b. 39.6
 c. 44.5 d. 18.6
198. One knot is equal to _____
 a. 1.85 kmph
 b. 1.152 mph
 c. 1.69 feet per second
 d. All of above are correct *
199. Standard atmospheric pressure at mean sea level is
 a. 29.921 of Hg
 b. 14.7 PSI
 c. 1013.25 mB
 d. All of above are correct *
200. The lower most layer which extends to a height of 36,090 ft is known as
 a. Stratosphere b. Troposphere *
 c. Ionosphere d. Stratopause
201. The layer extending above tropopause is called
 a. Stratosphere * b. Troposphere
 c. Ionosphere d. Stratopause
202. The boundary layer between troposphere and stratosphere is called
 a. Stratopause * b. Tropopause
- c. Ozonsphere d. Exosphere.
203. As we go higher and higher atmospheric pressure will
 a. Increase
 b. Decrease *
 c. Remain constant
 d. Pressure has got no relation with height
204. As altitude increases the atmospheric pressure will
 a. Decrease *
 b. Decrease and remain constant above certain height
 c. Increase
 d. Not change with altitude
205. The rate at which the temperature falls with increase in altitude is known as
 a. Temperature rate
 b. Lapse rate *
 c. ICAO Temperature rate
 d. None of above
206. Which of the following statement is correct
 a. Temperature increase 1.98 °C per 1000' increase in altitude
 b. Temperature decrease at the rate of 1.98 °C per 1000' increase in altitude *
 c. Temperature decrease at the rate of 1.98 °C per 1000' decrease in altitude
 d. Temperature has no relation with altitude
207. Above 36,090 feet the temperature remains constant at
 a. +56.5 °C b. -56.5 °C *
 c. -65.5 °C d. None of above correct
208. An increase in static air pressure effects air density by
 a. Decreasing the density
 b. Does not effect the density
 c. Increasing the density *
 d. None of the above
209. A decrease in temperature affects the air density by
 a. Decreasing the density
 b. Does not affect the density
 c. Increasing the density *
 d. None of the above
210. Pressure ratio is
 a. Ambient pressure divided by sea level standard pressure measured *
 b. Ambient pressure is millibars control divided by 29.92
 c. Ambient pressure is PSI divided by 2116
 d. Sea level standard pressure is inches of Hg divided by 29.92
211. Density ratio (Sigma) is
 a. Equal to pressure ratio divided by temperature ratio
 b. Is measured in slugs per cubic feet
 c. Equal to the ambient density divided by sea level*
 d. None of the above

212. Dynamic pressure of an Airstream is
 a. Directly proportional to the square velocity
 b. Directly proportional to the air density
 c. Both a. and b. are correct *
 d. None of the above
213. Bernoulli's equation for subsonic flow states
 a. If the velocity of air stream with in the tube increases, the static pressure of the air increases
 b. If the area of the tube decreases static pressure of air increases *
 c. If the velocity of an air stream with in tube increases, the static pressure of the air decreases but sum of static pressure and velocity remains constant
 d. None of the above
214. The freedom about vertical axis which is perpendicular to other two axes is called
 a. Titting freedom b. veering freedom *
 c. Spinning freedom d. None of the above
215. Tilting freedom is about
 a. Vertical axis b. Centre axis
 c. Horizontal axis * d. None of the above
216. A Gyro can have maximum how many gimbal rings
 a. One b. Two *
 c. Three d. Four
217. A Gyro can have gyroscopic properties only when
 a. Rotor is stationary
 b. Rotor is running *
 c. Rotor is not required in the gyroscope
 d. None of the above
218. Rigidity of gyroscope depends on which of the following factor
 a. The mass of the rotor
 b. The speed of rotation
 c. Radius of gyration
 d. All of the above correct *
219. Precession is the angular change take place
 a. 90° away in the direction of rotation *
 b. 180° away in the direction of rotation
 c. 90° away in the opposite direction of rotation
 d. None of the above
220. The axis about which torque is applied is called
 a. Input axis * b. Output axis
 c. Gimbaraxis d. None of the above
221. Gyroscopes can be used as
 a. Attitude indicator * b. Altitude indicator
 c. Air speed indicator d. None of the above
222. Earth rate ω_e is equal to
 a. 15° per hour * b. 24° per hour
 c. 10° per hour d. None of the above
223. The apparent drift in case of free gyroscope depends on which of the following factor
 a. Earth rate
 b. Latitude at which it is position
 c. The orientation of spin axis and input axis
 d. All of the above *
224. Real drift in gyro is caused due to
 a. Bearing friction
 b. Gimbal imbalance
 c. Orientation of spin axis
 d. Both a. and b. are correct *
225. When input axis is align with local east the earth rate is equal to
 a. $\omega_e \cos \lambda$
 b. $\omega_e \sin \lambda$
 c. nil *
 d. Earth rate has no relation with input axis alignment
226. Transport wander when input axis is align to local east is equal to
 a. U/R b. V/R *
 c. $(U/R) \tan \lambda$ d. None of the above
227. Earth rate when input axis alignment to local north is
 a. Nil b. $\omega_e \sin \lambda$ *
 c. $\omega_e \cos \lambda$ d. Either b. or c.
228. Transport wander when input axis is align with local north is
 a. U/R * b. V/R
 c. $(U/R) \tan \lambda$ d. None of the above
229. Earth rate when input axis is align with local vertical
 a. $\omega_e \cos \lambda$ b. $\omega_e \cot \lambda$
 c. $\omega_e \tan \lambda$ d. $\omega_e \sin \lambda$ *
230. Transport wander when input axis alignment is local vertical
 a. U/R b. V/R
 c. $U/R \sin \lambda$ d. $U/R \tan \lambda$ *
231. When spin axis becomes coincident one or other axis of freedom, it is called
 a. Real drift b. Gimbal error
 c. Gimbal lock * d. None of the above
232. When gimbal rings in a gyroscope, not mutually at right angle to each other is called
 a. Gimbal error * b. Gimbal lock
 c. Gimbal unbalanced d. Gimbal gimbaling
233. Which of the following statement regarding precession is correct
 a. The rate of precession is proportional to the applied force *

254. Which of the following combination material is used for CHT measurement
- Copper and constantan *
 - Chromel and alumel
 - Iron and constant
 - Both a. and c.
255. Chromel and Alumel can measure the temperature up to
- 100°F
 - 1100°C *
 - 850°F
 - 850°C
256. In case of Pure Jet Engine exhaust - gas velocity is high so in this case thermocouple used is
- Rapid response type
 - Stagnation type *
 - Surface contact type
 - All the above
257. Thermo e.m.f. depends upon
- Hot junction temperature
 - Cold junction temperature
 - Temperature difference between hot and cold junction *
 - None of the above
258. Which of following is a measuring element ?
- Pitot head
 - Capsule *
 - Rocking shaft
 - None of the above
259. The element by which displacements are magnified and transmitted is called
- Coupling element *
 - Indicating element
 - Detecting element
 - None of the above
260. Which of the following is a detecting element
- Capsule
 - Rocking shaft
 - Pitot head *
 - All of the above
261. The dimensioning of gear teeth must allow for set amount of play to avoid jamming is called
- Tolerance
 - Backlash *
 - A learance
 - All of the above
262. Which of the following is the function hair spring
- It provides controlling force *
 - It provides restoring force
 - It balances the deflecting force to establish required calibration low
263. Material used for making hair spring is
- Phos phar - bronze
 - Beryllium - copper
 - Both a. and b. are correct *
 - None of the above
264. Inver is used for making bi-metallic strip because it has got
- Negative co-efficient of linear expansion *
 - Positive co-efficient of linear expansion
 - Negligible co-efficient of linear expansion
 - None of the above
265. Altimeter and ASI use which type of following temperature compensating devices
- Thermomagnetic shunt
 - Thermo resistance
 - Bimetallic strip *
 - Any one of the above
266. Take - off and precautionary ranges in a ASI dial indicated by
- Green arc
 - Yellow arc *
 - Green radial line
 - Yellow radial line
267. 'White arc' on the ASI dial indicates
- Range in which aerobatics can be done
 - Range in which autopilot can be engaged
 - Range in which landing flaps may be extended *
 - All of the above
268. Range in which operation is prohibited is shown in ASI dial by
- Red arc *
 - Green arc
 - Red radial line
 - Yellow radial line
269. Pitot pressure 'P' is equal to
- $\frac{1}{2}\rho V^2$
 - $\frac{1}{2}pV^2$ *
 - mgh
 - None of the above
270. The pitot pressure tube is provided with baffles to prevent entry of
- Water in to pitot tube
 - Any foreign matter in to the tube *
 - Both a. and b. are correct
 - None of the above
271. Heating element is provided in pitot head
- To keep it hot so that air can pass easily
 - To avoid the formation of ice at high altitude *
 - To keep it hot so that no inset can inter inside
 - None of the above
272. The amount by which the local static pressure at given point in the flow field differs from the free stream static pressure is known as
- Position error
 - Pressure error
 - Density error
 - a. and b. same and correct *
273. Location of pressure head in case of sub-sonic a/c is
- Wing tip *
 - Ahead of vertical stabilizer
 - At the side of fuselage nose section
 - Any one of the above correct
274. Drain traps are provided in the pitot static line for
- Drain out trapped fuel from the tube
 - Allow accumulation of water
 - To relief extra pressure from the tube
 - None of the above *
275. The pitot static tube is of

- a. Seamless tube
b. As in a. and made of corrosion resistance metal
c. As in b. and made of tungum *
d. None of the above
276. Which of the following barometer is used in altimeter
a. Fortin barometer b. Kew barometer
c. New man barometer d. none of the above *
277. The Kew barometer is of the
a. Fixed cisten type
b. Fixed scale type
c. Moving cisten type
d. both a. and b. are correct *
278. In an aneroid barometer used
a. Mercury b. Water
c. White spirit d. None of the above *
279. Pressure sensing element in a Aneroid barometer is
a. Evacuated metal capsule *
b. Static pressure in given inside the capsule
c. Is a gas filled capsule
d. None of the above
280. When the atmosphere conform to standard value the an altimeter will read
a. Indicated altitude *
b. Pressure altitude
c. Radio altimeter altitude
d. None of the above
281. Setting the pressure prevailing at an airfield to make the altimeter read zero on landing and take-off.
a. QNE b. QFE *
c. QNH d. QNN
282. Setting the standard sea level pressure of 1013.25 mb make the altimeter read airfield elevation
a. QNE b. QFE
c. QNH * d. None of the above
283. In a servo altimeter linear movement of capsule is converted to electrical signal by
a. Servomotor b. Amplifier
c. E and I Bar pick off * d. None of the above
284. Mode C of ATC and SSR is for
a. Interrogation * b. Altitude Reporting
c. Not assigned d. None of the above
285. Square law compensation device is used in
a. ASI * b. Altimeter
c. Barometer d. None of the above
286. Which of the following is associated problem due to square law
a. "Close up" scale at initial stage *
b. "Open up" scale at final stage
c. Difficult to accommodate large range
d. All of the above.
287. Which of the following is referred of mach number
a. True air speed / speed of sound *
b. Indicated air speed / speed of sound
c. Calibrated air speed / speed of sound
d. All of the above
288. Mach warning system provides an aural warning at light deck when
a. Operating speed is exceeded *
b. Speed reduces to stalling speed
c. Both a. and b. are correct
d. None of the above
289. A VSI measures which of the following quantity
a. Vertical speed
b. Change in static pressure
c. Rate of change in static pressure *
d. None of the above
290. When altitude increase the ROCI capsule
a. Expands
b. Contracts *
c. Non - change in VSI capsule
d. None of the above
291. Zero in the VSI dial is at
a. 12 O'clock position b. 6 O'clock position
c. 9 O'clock position * d. None of the above
292. Metering unit in VSI is to
a. Create a differential pressure between case and capsule pressure *
b. temperature compansation
c. Avoid sudden surge of pressure
d. None of the above
293. The transponder reply frequency to the interrogation is
a. 1030 mHz b. 1090 mHz *
c. 1030 kHz d. 1090 kHz
294. Mode 'D' of the transponder is for
a. Interrogation
b. Altitude reporting *
c. At present unassigned
d. None of the above
295. A reset circuit is incorporated in the altitude alert unit, its function being to reset the logic when ever selector knob operated to change the altitude by
a. More than 100 ft and rate greater than 1000' per minute
b. More than 8000 ft and rate greater than 100' per minute
c. Less then 100 ft and rate greater than 1000' per minute *
d. None of the above
296. The maximum safe speed of a/c over its operating range is indicated by
a. 'V_{mo}' pointer of mach / air speed indicator *

- b. 'V_{SM}' pointer of mach / air speed indicator
 c. Critical mach number of mach / air speed indicator
 d. Command 'bug' of mach / air speed indicator
297. Differential pressure corresponding to full scale deflection in a VSI is
 a. 20 mm of Hg appx *
 b. 20 mm of H₂O appx.
 c. Both a. and b. are correct
 d. There is no differential pressure in VSI since it is measuring rate of change in static pressure
298. If the metering unit of VSI is made up of only capillary type it will introduce
 a. Negative error b. Positive error
 c. No error d. None of the above *
299. Differential pressure across an orifice varies
 a. Inversely as the temperature
 b. Directly as the temperature *
 c. No relation with temperature
 d. None of the above
300. In a pressurised cabin the case of the altimeter leaking, it will
 a. Under read *
 b. It will over read
 c. No change in reading
 d. None of above
301. The true air speed (TAS) may be computed according to formula
 a. $TAS = aM$ *
 b. $TAS = C_m \sqrt{T}$
 c. $TAS = C \cdot f(m) \sqrt{T_c}$
 d. All above are correct
302. Central air data computer (CADC) is a
 a. Digital computer
 b. Analogue computer
 c. It can be either digital or analogue computer *
 d. It is a ground supporting computer used in ATC
303. In stantaneous vertical speed indicator employs
 a. An accelerometer unit
 b. As in a. and it create rapid differential pressure *
 c. A speed governor which creates rapid differential pressure
 d. None of the above correct
304. A capillary tube used between metering unit and capsule inlet to
 a. Create differential pressure
 b. Prevents pressure surge reaching capsule *
 c. Compensate for temperature variation
 d. None of the above are correct
305. Sound emitted from mach warning switch at the frequency of
 a. 150Hz b. 90Hz
 c. 20KHz d. 7 Hz*
306. "Banana slot" is a mechanism used in
 a. ASI for square law compensation *
 b. ASI for temperature compensation
 c. Altimeter for temperature compensation
 d. None of the above are correct
307. Dynamic pressure which an ASI measures is equal to
 a. $\frac{1}{2} \rho V^2$ b. $\frac{1}{2} \rho V^2$ *
 c. $\frac{1}{2} \rho V^2 h$ d. None of the above
308. The acute angle between the relative wind and chordline in known
 a. Chord angle b. Take off angle
 c. Angle of attack * d. None of the above
309. The point on the cambered airfoil where pitching moment is constant is known as
 a. Aerodynamic center *
 b. Center of pressure
 c. CG point
 d. None of above
310. Rolling of the a/c takes place about which axis
 a. Longitudinal axis * b. Lateral axis
 c. Normal axis d. All of the above
311. The movement of a/c about lateral axis is called
 a. Rolling b. Pitching *
 c. Yawing d. None of the above
312. When an aircraft has atendency to return to a trimmed angle of attack following a displacement, it is said to have
 a. Positive static longitudinal stability *
 b. Negative static longitudinal stability
 c. Positive static lateral stability
 d. Negative static lateral stability
313. The force parallel to relative wind which opposes the motion of the body
 a. Lift b. Thrust
 c. Drag * d. All of above
314. The net force developed perpendicular to the relative wind is
 a. Lift * b. Thrust
 c. Drag d. All of the above
315. The straight line connecting the leading edge and trailing edge of air foil is
 a. Chord b. Chordline *
 c. Cambered line d. None of the above
316. Maximum distance between the mean camber line and chord line is
 a. Maximum thickness b. Maximum camber *
 c. Mean cambered d. None of the above

317. Which of the following will develop positive lift
- A symmetrical airfoil at zero AOA
 - A non rotating cylinder in a wind tunnel
 - A cambered airfoil at zero AOA *
 - None of the above
318. The magnus effect explains why
- A bowling ball curves *
 - A pitched baseball curves
 - A golf ball slices
 - Both b. and c. are correct
319. For symmetrical airfoil, the centre of pressure
- Moves forward as AOA increases *
 - Stays at some place as AOA increases
 - No pitching movement about the CP
 - Both b. and c. are correct
320. The drag composed of drag components produced by the surface or skin friction is called
- Induced drag
 - Profile drag
 - Vortex drag
 - None of above *
321. Which of the following control surface provides lateral control or displacement about longitudinal axis
- Elevators
 - Rudder
 - Ailerons *
 - Both a. and c.
322. Ailerons always move
- Same direction
 - Opposite direction *
 - Anyway the pilot desires
 - None of the above
323. When the aileron of right wing is lowered the lift force cause the a/c to roll displacement to
- Left *
 - Right
 - Pitch up
 - None of the above
324. Elevators are normally mounted on the common rear hinge of
- Both the wing
 - Horizontal stabilizer *
 - Vertical stabilizer
 - None of the above
325. Elevators assist to maintain
- Longitudinal stability *
 - Lateral stability
 - Directional stability
 - Both a. and b. are correct
326. Elevator provides
- Longitudinal control
 - Pitch control about lateral axis
 - Both a. and b. are correct *
 - None of the above
327. When the control column is moved backwards
- The elevator raised and a/c nose down
 - The elevator raised and a/c nose up *
 - The elevator lowered and a/c nose down
 - The elevator lowered and a/c nose up
328. The surface which provides directional control or yawing moments is called
- Ailerons
 - Elevators
 - Rudder *
 - Flaps
329. The rudder is operated in response to movement by pilot of a
- Foot operated rudder bar
 - A pair of foot operated rudder pedals *
 - Both a. and b. are correct
 - None of the above
330. The rudder is turned to the left and a/c nose to the left when
- Left pedal is pushed forward *
 - Left pedal is pushed rearward
 - Right pedal is pushed forward
 - None of the above
331. Trim tabs are
- Primary control surface
 - secondary control surface *
 - Not a control surface since it is required only for trimming
 - None of these
332. Trim tabs are hinged at the :
- Trailing edge of primary surface *
 - Trailing edge of auxiliary surface
 - Leading edge of auxiliary surface
 - None of the above
333. Suction for air driven gyro can be created by
- Venturi on slip stream
 - Vacuum pump
 - An air cylinder
 - Both a. and b. are correct *
334. At high attitude vacuum driven instruments suffer from the effect of
- Decrease in temperature at high altitude
 - Decrease in vacuum due to low atmospheric pressure
 - Ionisation at high altitude
 - All of the above are correct *
335. Which of the following is / are disadvantage of vacuum driven gyro
- Increased weight due to pipe line
 - Special arrangements to control vacuum in pressurized cabin aircraft
 - Possibility of corrosion
 - All of the above are correct *
336. The type of gyro used in artificial is
- Rate gyro
 - Earth gyro *
 - Tied gyro
 - Any one of the above can be used
337. The purpose of the A.H. is to indicate attitude of a/c in

- a. Rollaxis b. Ritch axis
c. Yawaxis d. Roll and pitch axis *
338. A bar stabilized by gyro scope symbolizes
a. A/C an ground b. Natural horizon *
c. Pitch angle d. None of the above
339. Which of the following statement is correct
a. Background plate symbolize sky and fitted to inner gimbal ring
b. Back ground plate symbolize ground and fitted to outer gimbal ring
c. Back ground plate symbolize sky and fitted to outer gimbal ring and carries bank pointer *
d. Bank ground plate symbolize sky and fitted to outer gimbal ring and caried course point
340. Freedom of gimbal system movement in pitch is
a. 70° b. 90°
c. 85°* d. 180°
341. Freedom of gimbal system movement in roll axis is
a. 180° b. 90°
c. 85° d. 360°*
342. The freedom of movement in pitch is restricted by :
a. A resilient stop * b. Limit stop
c. Micro switch d. Limit switch
343. The vacuum driven gyro rotates at approximately
a. 15000 rev/min
b. as in a. and anticlock wise direction as viewed from above *
c. as in a. and clock wise when viewed from above
d. none of these
344. Electrical power supply for gyro horizon is
a. 28 VDC
b. 26 V simple phase AC
c. 115 V 400 Hz single phase AC
d. 115 V 400 Hz 3- phase AC *
345. The Gyro horizon uses
a. 3 - phase squirrel - cage induction motor *
b. A DC motor
c. A starter motor
d. None of above
346. The mass of the rotor concentrated as near to the periphery as possible to ensure
a. Friction error minimum
b. No gyro drift
c. No apparent drift
d. Maximum inertia *
347. The failure of power supply in gyro horizon is indicated by
a. Red light on instrument bezel
b. Off flag actuated by solinoid *
c. Red colour flag
d. Both a. and b. are correct
348. Speed of electrical driven Gyro horizon is for approximately
a. 20000 - 23000 rev/min *
b. 20000 - 23000 rev/sec
c. 10000 - 12000 rev/min
d. 10000 - 12000 rev/sec
349. The upper half of the stabilized spherical element is
a. Coloured blue to indicate climb *
b. Coloured gray to indicate horizon
c. Coloured blue to indicate horizon
d. Coloured blue to indicate dive
350. Each half of the stabilized spherical element is graduated in
a. 10° increments upto 80° climb and 60° descent *
b. 10° increments upto 60° climb and 80° descent
c. 10° increment upto 180° climb and 110° descent
d. None of the above
351. The system used for maintaining gyro rotor axis in vertical position is called
a. Erection system *
b. Vertical stabilization system
c. Both a. and b. are correct
d. None of the above
352. Which of the following erection system utilizes the forces resulting from the effect of gravity
a. Pendulous vane type
b. Ball type unit
c. String type unit
d. Both a. and b. are correct *
353. Erection system work on the gyroscopic principle of
a. rigidity b. precession
c. angular velocity d. all of the above *
354. Torque motor and leveling switch is a
a. Vertical stabilization system
b. Roll control system
c. Pitch control system
d. Electrical erection system *
355. How many torque motors are there in leveling switch and torque motor erection
a. One b. Two *
c. Three d. Four
356. The displacement of gyroscope in pitch is detected by
a. Laterally mounted switch
b. Longitudinally mounted switch
c. Vertically mounted switch *
d. None of the above
357. Which of the following material has zero temperature co-efficient of resistance
a. Carbon b. porcelain
c. Copper d. manganin *

358. Which of the following material has got negative temperature of resistance
 a. Carbon * b. Brass
 c. Aluminium d. Copper
359. Two wires A and B have the same cross - section and are made of the same material $R_A = 600 \Omega$ and $R_B = 100 \Omega$. The number of times A is longer than B is
 a. 5 b. 6 *
 c. 4 d. 2
360. A cylindrical wire 1m length has a resistance 100Ω . What would be the resistance of a wire made from same material if both the length and cross sectional area are doubled
 a. 200Ω b. 400Ω
 c. 100Ω d. 50Ω *
361. Varistor is a
 a. Non linear resistor * b. Non linear capacitor
 c. Linear resistor d. Linear capacitor
362. Kirchhoff's current law applicable to only
 a. Closed loop in a network
 b. Electronic circuit
 c. Junctions in a network *
 d. Electric circuit
363. KVL is concerned with
 a. IR drop b. Battery emf
 c. Junction voltage d. Both a. and b. *
364. According to KVL algebraic sum of all IR drops and the emf in any closed loop of the network is
 a. Zero *
 b. Positive
 c. Negative
 d. Determined by battery emf
365. In SI system of units, the unit of force is
 a. Kg. wt b. Newton *
 c. Joule d. N - m
366. Basic unit of electrical charge is
 a. Ampere hour b. Watt - hour
 c. Coulomb * d. Farad
367. The SI unit of energy is
 a. Joule * b. kwh
 c. kcal d. m-kg
368. The unit of absolute permittivity of a medium is a
 a. Joule / Coulomb b. Newton / metre
 c. Farad / Metre * d. Farad / coulomb
369. The unit of electric intensity is
 a. Joule / coulombs
 b. Newton / coulombs *
 c. Volt / Metre
 d. Both b. and c. are correct
370. Capacitor consists of two
 a. Insulator separated by a dielectric
 b. Conductor separated by an insulator *
 c. Ceramic plates and one mica disc
 d. Silver coated insulators
371. Capacitance of a capacitor is not influenced by
 a. Plate thickness * b. Plate area
 c. Plate separation d. Nature of dielectric
372. A capacitor that stores charge 70.5 coulombs at 10 volts has a capacitance of _____ farad
 a. 5 b. 20
 c. 10 d. 7.05 *
373. Unit of magnetic flux is
 a. Weber * b. Ampere turn
 c. telsa d. Coulomb
374. Unit of magneto motive force is
 a. Weber b. Ampere turns *
 c. Henery d. Farod
375. Permeability in a magnetic circuit correspond to _____ in electric circuit
 a. Conductivity * b. Resistivity
 c. Conductance d. Resistance
376. The magnetising force (H) and magnetic flux density (B) are connected by the relation
 a. $B = \mu H$ * b. $B = H / \mu_0 \mu_r$
 c. $B = \mu_0 H / \mu_r$ d. $B = \mu_r H / \mu_0$
377. The magnitude of induced e.m.f. in a conductor depends on
 a. Amount of flux cut
 b. Amount of flux linkage
 c. Rate of change in flux linkage *
 d. Flux density of magnetic field
378. Direction of induced e.m.f. can be found with the help of
 a. Lenz's law
 b. Fleming's right hand rule *
 c. Kirchhoff law
 d. Laplace's law
379. Mutual inductance between two and magnetically coupled coils depends on
 a. Number of their turns
 b. Permeability of the core
 c. Cross sectional area of their common core
 d. All of the above *
380. The r.m.s. value of alternating current is equal to
 a. 0.707 of max. value of current
 b. Equal to max. value of current *
 c. Half of max. value of current
 d. None of above
381. Average value of alternating current is equal to

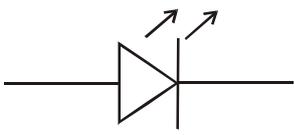
- a. 0.707 of its max. current
 b. 0.637 of its max. current *
 c. 0.5 of its max. current
 d. None of the above
382. Form factor K_f of alternating quantity
 a. 2.5
 b. 1.11 *
 c. 3.11
 d. 4.11
383. Amplitude factor of alternating current is
 a. The ratio of maximum value to r.m.s. value of current
 b. As in a and equal to 1.414 *
 c. As in a and equal to 1.11
 d. Form factor and Amplitude factor are same
384. Power in an AC circuit is given by
 a. $VI \cos \phi$ *
 b. $VI \sin \phi$
 c. $I^2 R$
 d. $I^2 X_L$
385. In an AC circuit with inductance only the power factor is
 a. 1
 b. zero *
 c. infinite
 d. None of the above
386. In an R-L circuit the power factor is
 a. zero
 b. Between 1 and 0 *
 c. 1
 d. None of the above
387. Impedance of circuit with capacitor only is equal to
 a. $1/\omega C$ *
 b. $1/\omega L$
 c. ωC
 d. ωL
388. The phase angle of current in AC circuit with capacitor only is
 a. 90° lag
 b. 90° lead *
 c. 180° lead
 d. 180° lag
389. Power factor of an AC circuit is given by
 a. cosine of phase angle *
 b. tangent of phase angle
 c. the ratio R/x_c
 d. the ratio $XL/2$
390. In an AC circuit the ratio of KW / KVA represents
 a. Local factor
 b. Power factor *
 c. Form factor
 d. Diversity factor
391. In a series resonance circuit the power factor is
 a. Unity *
 b. Zero
 c. Infinity
 d. None of the above
392. Circuit current in a series resonance circuit is
 a. Minimum
 b. Nil
 c. Maximum *
 d. Infinity
393. Net reactance in a series R - L - C circuit is
 a. $X_L - X_C$ *
 b. $\omega L - (1/\omega C)$
 c. $X_C - X_L$
 d. All a., b. and c. are correct
394. A series R - L - C circuit will have unit power factor if it is operated at a frequency of
 a. $1/LC$
 b. $1/W\sqrt{LC}$
 c. $(1/\omega^2)LC$
 d. $\frac{1}{2\pi\sqrt{LC}}$ *
395. Dynamic impedance AC parallel circuit at resonance
 a. (L/CR) Ohms *
 b. (CR/L) Ohms
 c. $\sqrt{[R^2 + (X_L - D_L)^2]}$
 d. None of the above
396. Power factor of parallel resonance circuit is
 a. Zero
 b. Unity *
 c. Infinity
 d. None of the above
397. A parallel R - L - C circuit at resonance magnifies
 a. Voltage
 b. Current
 c. Both Voltage and current
 d. None of above *
398. The impedance of parallel R - L - C circuit at resonance is
 a. Zero
 b. Minimum
 c. Maximum *
 d. None of the above
399. A parallel resonance circuit can be used
 a. To amplify certain frequencies
 b. To reject a small band of frequency
 c. As a high impedance *
 d. Both b. and c. are correct
400. In parallel LCR circuit line current is equal to
 a. (V/CR)
 b. $[V/(L/CR)]$ *
 c. (V/LC)
 d. None of the above
401. Unit of inductive reactance is
 a. Henery
 b. Ohm *
 c. Farad
 d. None of the above
402. Unit of capacitive reactance is
 a. Henery
 b. Ohm *
 c. Farad
 d. None of the above
403. Unit of impedance is
 a. Henery
 b. Ohm *
 c. Farad
 d. None of the above
404. Q factor of series R-L-C circuit in AC circuit is
 a. $(1/\text{Power factor})$
 b. $(1/\cos \phi)$
 c. $\frac{\omega L}{R}$ *
 d. All of above correct
405. Effective impedance of a series R - L - C circuit at resonance is equal to
 a. R *
 b. $2\pi fL$
 c. $1/2\pi fc$
 d. All of above correct
406. E. M. F. Can be produced or generated by which one of the following ways :

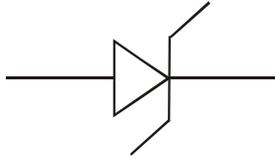
- a. By chemical action
b. Heating the junction of the dissimilar metal
c. By electromagnetic induction
d. All of the above *
407. The emf of a generator depending upon which of the following factor
a. Number of conductors
b. The speed of rotation
c. Flux density
d. All of the above *
408. Lap winding is a
a. Series winding
b. Parallel winding
c. Some times series and sometimes parallel winding*
d. None of the above
409. Lap winding required when
a. High current and low voltage is needed *
b. Low current and high voltage is needed
c. High current and high voltage is needed
d. Low current and low voltage is needed
410. Rotor of DC machine is usually supported in
a. bush bearing b. ball or roller bearing *
c. plummer blocks d. Magnetic bearing
411. Each commutator segment is connected to the armature by means of
a. Insulator b. Dielectric
c. Copper lug * d. Resistance wire
412. In generators Interpole field coils are connected
a. In series with armature winding *
b. In parallel with armature winding load
c. In series with the load
d. Parallel with the load
413. While pole flux remains constant if the speed of a shunt generator is doubled, its generated emf.
a. will be doubled *
b. will be halved
c. will remain unaltered
d. will tend to decrease slightly
414. Conditions for maximum efficiency in case of a DC generator is
a. variable loss = (1 / constant loss)
b. variable loss = constant loss *
c. variable loss = 2 x constant loss
d. variable loss = ½ constant loss
415. In case of wave winding number of parallel path is
a. equal to number of poles
b. always 2 *
c. equal to half of number of poles
d. both a. and b. are correct
416. Which one of the following statement is correct about interpoles
a. It is put in the pole faces opposite the armature conductor
b. It carry current in opposite direction to those of the currents in armature
c. It is used for neutralizing armature reaction
d. All the above *
417. The speed of dc motor may be varied by varying
a. field current
b. applied voltage
c. resistance in series with armature
d. any of the above *
418. Speed of dc motor is
a. always constant
b. directly proportional to back emf *
c. directly proportional to flux
d. inversely proportional to product of back emf and flux
419. The ratio of starting torque to full load torque is least in case of
a. shunt motor * b. series motor
c. compound motor d. all of above correct
420. Speed of series wound dc motor
a. can be controlled by shunt field regulator
b. can not be controlled by diverter
c. increase as flux decreases
d. increases as armature circuit resistance increase *
421. Armature reaction of a unsaturated dc machine is
a. non magnetising * b. magnetising
c. de-magnetising d. cross magnetising
422. When direction of power flow reverses a differentially compound motor becomes
a. a differently compounded generator
b. a cumulatively compounded generator *
c. a shunt motor
d. a series motor
423. Speed regulation of dc motor is
a. height speed / lowest speed.
b. no load speed / full load speed.
c. [full load speed / (no load speed - full load speed.)
d. [(no load speed - full load speed. / (full load speed.)]*
424. If flux of dc motor approaches zero
a. its speed approach zero
b. its speed will remain unchanged
c. the motor will stop
d. the motor tends run at infinite speed *
425. Back emf of a dc motor depends on
a. field flux * b. shape of conductor
c. type of slipring d. brush material
426. The different between the synchronous speed and actual speed of an induction motor is known as

- a. regulation b. back lash
c. slip * d. lag
427. When 'f' is the supply frequency 's' is the slip. The frequency of rotor current given by
a. $s \cdot f$ * b. f/s
c. $s^2 \cdot f$ d. $[(s \cdot f)/2]$
428. Induction motor is always on
a. leading power factor
b. zero power factor
c. maximum power factor
d. lagging power factor *
429. Induction motor is
a. self starting with zero torque
b. self starting with high torque
c. self starting with small torque and compared to rated torque *
d. assisted starting with zero torque
430. Induction motor can be operated on
a. AC * b. DC
c. both AC and DC d. battery
431. Single phase induction motor can be make a self starting by
a. split phase
b. shaded pole
c. reluct
d. all the above are correct *
432. Starting torque of a single phase induction motor where displacement of phase is done by capacitor is
a. uniform b. high *
c. low d. zero
433. A motor generally used for toys is
a. hysteresis motor
b. shaded pole motor *
c. two value capacitor motor
d. reluctance motor
434. Synchronous speed of induction motor is
a. $N_s = (120 f/P)$ * b. $N_s = (120 P/f)$
c. $(P \cdot f/120)$ d. None of the above
435. Which of the following motor can be operated on both AC and DC
a. induction motor b. synchronous motor
c. universal motor * d. shaded pole motor
436. Synchronous motor can be operate at
a. lagging power factor only
b. leading power factor only
c. unity power factor only
d. lagging, leading, and unity power factor only *
437. Resistivity of a wire depends on
a. length b. material *
c. cross section area d. none of above
438. Resistance of a wire is 'r' Ohms. The wire is stretched to double its length. Then its resistance is Ohms is
a. $r/2$ b. $4r$
c. $2r$ * d. $r/4$
439. Least current will flow through
a. 25 Ohms resistor * b. 18 Ohms resistor
c. 10 Ohms resistor d. 5 Ohms resistor
440. Which of the following have negative temperature co-efficient
a. Brass b. Mercury
c. Electrolytes * d. Sliver
441. Unit of conductance is
a. per ohm b. ohm/m
c. mho/m d. mho *
442. Unit of conductivity is
a. mho / metre * b. mho / sm
c. ohm / metre d. ohm / s m
443. Colour code number 3 is represented by
a. Blue b. Orange *
c. Grey d. Violet
444. In the colour code of white colour is represented by
a. 9 b. 8 *
c. 6 d. 5
445. When checked with Ohm meter open resistor reads
a. Zero b. Low but not zero
c. Infinite * d. None of the above
446. Rating of fuse wire is expressed in terms of
a. Ohms b. Mnos
c. Amperes * d. Watts
447. Unit of impedance in R - L - C circuit is
a. Mhos b. Watts
c. Joules d. Ohms *
448. Which of following has negative co-efficient of resistance
a. Wire wound resistor b. Metals
c. Non - metals d. Thermistors *
449. Which of following colour coded resistor has value of 10 K Ohms with 20 % tolerance
a. red, red, green and silver stripes
b. yellow, violet, yellow silver stripes
c. orange, orange, black and gold stripes
d. brown, black, orange and no tolerance bend *
450. Cells are connected in series to
a. increase voltage out put *
b. increase current out put
c. decrease voltage out put
d. decrease internal resistance
451. Specific gravity of acid is checked by

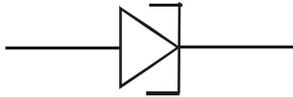
- a. hygrometer b. lectormeter
c. hydrometer * d. cell tester
452. When current and voltage are out of phase by 90° , the power is
a. Minimum b. Maximum
c. Zero * d. Infinite
453. R. M. S. value of sinusoidal 200 V peak to peak wave is
a. 200V b. $200\sqrt{2}$
c. $[(200)/\sqrt{2}]$ d. $\frac{100}{\sqrt{2}}$ *
454. Power factor of an inductive circuit can be improved by connecting capacitor to it in
a. series
b. parallel
c. either series or parallel *
d. depend on the value of capacitor
455. For an alternating voltage form factor is
a. $[(\text{RMS value}) / (\text{Mean value})]$ *
b. $[(\text{Mean value}) / (\text{RMS value})]$
c. $[(\text{RMS value}) / (\text{Peak value})]$
d. $[(\text{Peak value}) / (\text{RMS value})]$
456. Which of the following is minimised by laminating the core of transformer
a. Hysteresis loss b. Eddy current loss *
c. Heat loss d. All of above
457. Open circuit test of a transformer gives
a. Hysteresis loss
b. Eddy current loss
c. Sum of hysteresis loss and eddy current loss *
d. All of above
458. For a transformer, conditions for maximum efficiency is
a. Hysteresis loss = eddy current loss
b. Core loss = hysteresis loss
c. Copper loss = iron loss *
d. Total loss = $2/3$ copper loss
459. In a step down transformer
a. Secondary turns are less than primary turns *
b. Secondary power is less than primary power
c. Phase shift is always 90°
d. All of above
460. Step up transformer increases
a. Power b. Power factor
c. Voltage * d. Frequency
461. In a transformer, the copper loss at half load as compared to that at full load will be
a. 4 times b. 2 times
c. Half d. One fourth *
462. In an ideal step up transformer the secondary power is
a. Equal to primary power *
b. More than primary power
c. Less than primary power
d. Has no relation with primary power
463. 1 tesla is the same as
a. 1 weber b. 1 henry
c. 1 weber/m^2 * d. 100 weber/m^2
464. Open circuit test is done to transformer to determine
a. Efficiency b. copper loss *
c. Core loss d. None of above
465. A step up transformer
a. Increases voltage b. Decreases current
c. Increases power d. Both a. and b. *
466. If secondary of 1 : 10 step up transformer is connected to primary of 1 : 5 step up transformer, the total transformation will be
a. 15 b. 30
c. 50 * d. 2
467. Eddy current loss in a transformer can be reduced by
a. Reducing the thickness of laminations *
b. Increasing the thickness of lamination
c. Increasing air gap in the magnetic circuit
d. Reducing air gap in the magnetic circuit
468. High frequency transformer
a. Carbon cores are used
b. Wooden cores are used
c. Ferrite cores are used *
d. Aluminium cores are used
469. Transformer can have zero voltage regulation at
a. Zero power factor
b. Lagging power factor
c. Leading power factor *
d. Unity power factor
470. Which of the following statement correct
a. Core loss vary from 1 % to 3 % between no load and full load
b. Copper loss vary from 1 % to 3 % between no load and full load
c. Core loss vary from 10 % to 30 % between no load and full load
d. Copper loss vary from 10 % to 30 % between no load and full load *
471. Phase difference between the primary voltage and secondary voltage is
a. 0° b. 90°
c. 180° * d. 270°
472. Path of magnetic flux in transformer should have
a. Low reluctance * b. Low resistance
c. High reluctance d. High resistance
473. Transformation ratio 'K' is equal to

- a. V_s/V_p b. E_s/E_p
 c. N_s/N_p d. All of above *
474. The efficiency of transformer does not dependent on
 a. Current b. Load
 c. Power factor d. All of the above *
475. Power factor in transformer leading
 a. is always unity
 b. is always load
 c. is always lagging
 d. Depends on power factor of load *
476. The power transformer will have highest efficiency at
 a. 25 % of rated load b. 50 % of rated load
 c. 75 % of rated load d. 93 % or rated load *
477. Phase difference between primary and secondary of transformer is
 a. Between 45° to 90° b. Between 90° to 135°
 c. 180°* d. 270°
478. In a step up transformer primary voltage is 20 V and secondary voltage is 100 V at primary current is 5 ampere what is secondary current
 a. 25 volt b. 25 ampere
 c. 1 Volt d. 1 ampere *
479. In a step up transformer with turn ratio 1: 5. If input power is 2 KVA its output power will be
 a. 10KVA b. 2/5 KVA
 c. 2 KVA* d. None of the above
480. Voltage regulation will be zero in a transformer in case of the power factor
 a. Unit b. 0.5
 c. Leading* d. Lagging
481. Vacuum tubes are still used in some electronic devices due to
 a. Their long life
 b. Trouble face operation
 c. Capacity to handle high power*
 d. Their better reliability
482. Emission of electrons in a vacuum diode is achieved by
 a. Electrostatic field b. Magnetic field
 c. Heating* d. Electron bombardment
483. Energy can be provided to electron to cross the surface barrier by
 a. Heating b. Electric field
 c. Light d. All of the above *
484. The principle of emission of electrons from a metal surface under influence light is called
 a. Photo electric emission*
 b. See back effect
 c. Secondary emission
 d. None of the above
485. Secondary emission of electron occurs when the metal surface is
 a. Cooled to very low temperature
 b. Heated
 c. Subject to electric field as well magnetic field
 d. Bombardment with high energy electrons *
486. Which of the following emission process widely used vacuum tube
 a. Photo electric emission
 b. Field emission
 c. Thermionic emission*
 d. Secondary emission
487. When the cathode of vacuum is heated and anode is not connected to any external circuit
 a. Electrons escape through glass tube
 b. Glass tube get charge
 c. Electrons form a space charge*
 d. Filament emits electrons and plate is positive with respective to cathode
488. Anode material is usually
 a. Nickel* b. Carbon
 d. Copper d. Aluminium
489. For a triode the ratio of small change in plate current to the change in grid voltage producing it when plate voltage remain constant
 a. Mutual conductance*
 b. Amplification factor
 c. Tube ratio
 d. None of the above
490. Triode characteristics between plate voltage and plate current for constant value of grid voltage
 a. Mutual characteristics
 b. Constant current characteristics
 c. Static plate characteristics*
 d. Voltage transfer characteristics
491. Units of amplification factor
 a. Milli - seimens b. Volts
 c. Milli - maperes d. It is dimension less *
492. In a pentode suppressor grid is provided between
 a. Plate and screen grid*
 b. Cathode and heater
 c. Screen grid and control digit
 d. None of above
493. In pentode control grid is provided between
 a. Cathode and screen grid*
 b. Plate and suppresser grid
 c. Screen grid and plate
 d. Screen grid and suppresser grid
494. Which of the following vacuum tube devices can not be used of amplifier
 a. Diode* b. Triode
 c. Tetrode d. Pentode

495. In pentode suppressor grid is to
 a. Reduce the grid plate capacitance
 b. Eliminate the problem of secondary emission from the plate *
 c. Usually has + ve potential less than the plate voltage
 d. Is usually connected internally to the central grid
496. The screen grid is pentode
 a. makes the plate current more dependent on the plate voltage
 b. has same potential of the cathode
 c. decrease the grid plate capacitance is compared with triode *
 d. eliminate problem of secondary emission
497. Function of suppressor grid
 a. Suppresses secondary emission effect *
 b. Increases amplification factor
 c. Reduces C_{gp}
 d. All of above
498. In a triode parasitic capacitance exist between
 a. Plate and cathode b. Plate and grid *
 c. Grid and cathode d. Any of the above
499. In a diode the plate current increases when the
 a. Plate voltage made more positive
 b. Plate voltage made more negative
 c. Control grid voltage is made less negative *
 d. Saturation plate current is reached
500. Process by which impurities are added to a pure semiconductor is
 a. Diffusing b. Drift
 c. Doping * d. Mixing
501. Germanium atom contains
 a. Two electron orbit b. Three valence electron
 c. Four protons d. Four valence electrons*
502. Type of atomic bonding most common in semiconductor is
 a. Metallic b. Ionic
 c. Covalent * d. Chemical
503. Number of proton in an atom is called
 a. isotope number b. Atomic number *
 c. Atomic weight d. None of above
504. Maximum number of electron in the 3rd orbit can be
 a. 3 b. 6
 c. 12 d. 18 *
505. Atomic number of germanium is 32. The number of electrons in outer most shell will be :
 a. 2 b. 4 *
 c. 6 d. 3
506. Valence electrons are the
 a. Loosely packed electrons
 b. Mobile electrons
 c. Electron present in outer most orbit *
 d. Electron that do not carry any charge
507. Which of following have four valence electron
 a. Silicon b. Germanium
 c. Boron d. Both a. and b. *
508. Semiconductor in pure state is called
 a. Intrinsic *
 b. Extrinsic
 c. 'P' type semiconductor
 d. 'n' type semiconductor
509. The forbidden energy gap between the valence band and conductance band will be wide in case of
 a. Semiconductor
 b. All metals
 c. A good conductors of electricity
 d. Insulators *
510. At absolute zero temp. semiconductor behaves like
 a. An insulator * b. A super conductor
 c. Good conductor d. Variable resistor
511. Semiconductor have
 a. Zero temp. co-efficient of resistance
 b. Positive temp. co-efficiently of resistance
 c. Negative temp. co-efficient of resistance *
 d. None of the above
512. Which of the following is donor impurity
 a. Aluminium b. Boron
 c. Phosphorous * d. Indium
513. Which of the following is a acceptor impurity
 a. Antimony b. Arsenic
 c. Gallium * d. Phosphorous
514. The figure represents
 a. Esaki diode b. Varactor diode *
 c. Triac d. Gun diode
- 
515. The figure represents
 a. LED * b. Varistor
 c. SCR d. Diac
- 
516. The figure represents
 a. Zener * b. Tunnel diode
 c. Photo sensitive dioded. Photo emissive diode



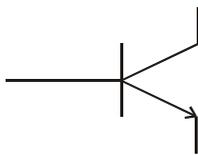
517. The figure represents
 a. Tunnel diode * b. Varactor diode
 c. Zener diode d. None of the above



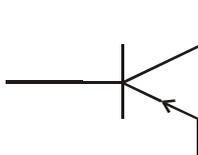
518. The figure represents
 a. Varactor * b. LED
 c. Zener diode d. None of the above



519. The figure represents
 a. NPN transistor * b. PNP transistor
 c. P channel FET d. MOSFET



520. The figure represents
 a. NPN transistor b. PNP transistor *
 c. 'P' channel FET d. 'N' channel FET



521. The electrons in the outer most orbit is called _____ electron
 a. Acceptor b. Donor
 c. Covalent d. Valence *

522. Semi conductors have _____ temperature co-efficient of resistance
 a. Positive b. Negative *
 c. Zero d. None of the above

523. When a diode is forward biased its
 a. Barrier potential increase *
 b. Barrier potential decreases
 c. Majority current reduces
 d. Minority current reduces

524. Which of the following doping will produce 'P' type semiconductor ?
 a. Germanium with antimony
 b. Germanium with phosphorous
 c. Germanium with indium *
 d. All of above

525. Zener diode is invariably used with
 a. Forward bias b. Reverse bias *
 c. Zero bias d. None of the above

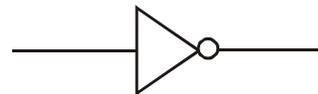
526. A LED produce light when
 a. Forward biased * b. Reverse biased
 c. Unbiased d. None of above

527. Which of the diode designed to operate in the break down region
 a. Signal diode b. Power diode
 c. Zener diode * d. All of the above

528. In case of PN - Junction forward biased
 a. Potential barrier decrease
 b. Depletion region decrease
 c. Depletion region increases
 d. Both a. and b. correct *

529. A PN - Junction offers
 a. High resistance in forward and reverse direction
 b. Low resistance in forward and reverse direction
 c. Conducts in forward direction only *
 d. Conducts in reverse direction only

530. The symbol represents which of the following gates
 a. NAND gate b. NOR gate
 c. NOT gate * d. AND gate



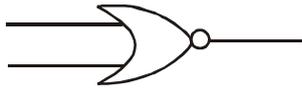
531. The symbol represents which of the following gates
 a. AND gate * b. NAND gate
 c. OR gate d. None of the above



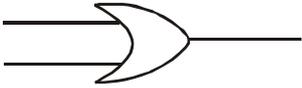
532. The symbol represents _____
 a. AND gate b. NAND gate *
 c. OR gate d. None of the above



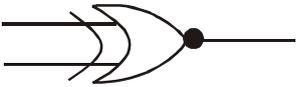
533. The symbol represents which of the following gates
 a. AND gate b. NAND gate
 c. NOR gate * d. None of the above



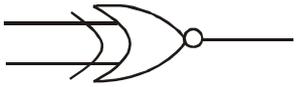
534. The symbol represents which of the following gates
 a. AND gate b. NAND gate
 c. OR gate * d. None of the above



535. The symbol represents which gate
 a. EX - OR gate * b. NOR gate
 c. OR gate d. EX - NOR gate

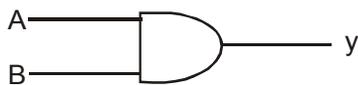


536. The symbol represents _____
 a. EX - OR gate b. EX - NOR gate *
 c. OR gate d. None of the above

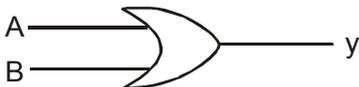


537. What is output of the gate if input is 'A'
 a. $y = A$ b. $y = A$
 c. $y = 0$ d. Can not be define *

538. What is the output of the gate below
 a. $y = AB *$ b. $y = AB$
 c. $y = A + B$ d. Both b. and c.



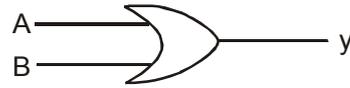
539. What is the output of the gate below
 a. $y = A + B *$ b. $y = AB + AB$
 c. $y = AB$ d. Both a. and b.



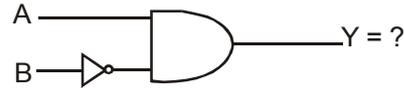
540. What is value of 'y' below
 a. $A + B$
 b. $y = A + B$
 c. AB
 d. Both a. and b. are correct *



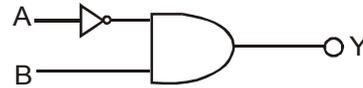
541. What is value of 'y' below
 a. $y = A - B$ b. $y = A + B *$
 c. AB d. Both a. and b. are correct



542. What is the value of 'y' is
 a. $A + B$ b. AB
 c. $AB *$ d. $A + B$



543. What is value of 'y' in fig. below
 a. AB b. $\bar{A} B *$
 c. $A + B$ d. $A + B$



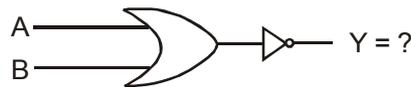
544. In an exclusive OR gate both the inputs are same. What will be output.
 a. 1 b. 0 *
 c. Either 1 or 0 d. Can not be define

545. In a 3 input AND gate, the input $A=0, B=1, C=1$ what will be output
 a. 1 b. 0 *
 c. Either 1 or 0 d. None of the above

546. Which of the following gate is universal gate
 a. AND, OR b. NOT OR
 c. NOT, AND d. NAND, NOR *

547. Which of the following gate can have two or more inputs
 a. AND b. OR
 c. Both a. and b. * d. None of the above

548. The logic circuit given below is equivalent to
 a. NOR * b. NAND
 c. OR d. EX-OR

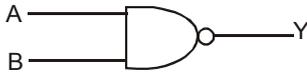


549. The logic, circuit below is equivalent to
 a. OR gate * b. NAND gate
 c. AND gate d. None of the above



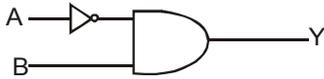
550. What is the output of logic circuit

- a. $y = AB$
- b. $\overline{A} + \overline{B}$
- c. $\overline{A} \overline{B} *$
- d. $A + B$



551. What is logic out put ?

- a. $y = AB$
- b. $A + B$
- c. $A \overline{B} *$
- d. $A + B$



552. All the inputs of a NOR gate are 1 what will be output

- a. 0 *
- b. 1
- c. Either 0 or 1
- d. None of the above

553. Both the inputs of a two input EX - OR gate are not same. What will be output ?

- a. 0
- b. 1 *
- c. Either 0 or 1
- d. None of the above

554. $\overline{A + B}$ is equal to

- a. $A + B$
- b. $\overline{A} \cdot \overline{B} *$
- c. $A + \overline{B}$
- d. None of the above

555. AB is equal to

- a. $A + B$
- b. $A \cdot B$
- c. $\overline{A} + \overline{B} *$
- d. None of the above

556. In Boolean algebra $A + A = ?$

- a. $A *$
- b. $2A$
- c. 1
- d. 0

557. In Boolean algebra $A \cdot A = ?$

- a. A
- b. A^2
- c. 1
- d. None of the above *

558. In Boolean algebra $A + 1$ is equal to

- a. 1 *
- b. 0
- c. 10
- d. None of the above

559. A is equal to

- a. $A + A *$
- b. $A \cdot A$
- c. 1
- d. 0

560. In Boolean algebra $A + A$ is equal to

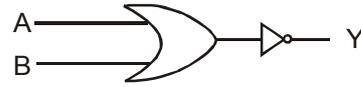
- a. 0
- b. 1
- c. $A *$
- d. \overline{A}

561. Output of exclusive OR gate is

- a. $A \oplus B$
- b. $\overline{A} B + A \overline{B} *$
- c. $AB + AB$
- d. both a. and b. are correct

562. In following figure what is value of 'X'

- a. $X = A + B$
- b. $X = \overline{A + B} *$
- c. $X = A \cdot B$
- d. $AB = X$



563. $A + B = y$, the boolean expression is

- a. NAND
- b. AND
- c. NOR
- d. OR *

564. NAND gate is called universal logic element because

- a. It is used by every body
- b. Any logic function can be realized by NAND gate*
- c. All the minimization techniques are applicable for optimum NAND gate realization
- d. Many digital computers use NAND gate

565. $A(A + B)$ in boolean relation is equal to

- a. $A *$
- b. $A^2 + AB$
- c. $A + B$
- d. None of the above

566. $A(A + B)$ is boolean relation is equal to

- a. $(A + B)$
- b. AB
- c. $A *$
- d. None of the above

567. $A \cdot A$ in Boolean relation is equal to

- a. 1
- b. Zero
- c. A^2
- d. None of the above *

568. The truth table given here is for which gate

- a. NAND
- b. NOR
- c. AND
- d. OR *

INPUT		OUTPUT
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

569. The truth table given here is

- a. NAND
- b. NOR
- c. AND *
- d. OR

INPUT		OUTPUT
A	B	Y
0	0	0
0	1	0
1	1	1
1	0	0

570. Which of the following is temporary memory

- a. ROM
- b. RAM *
- c. Both a. and b. are correct
- d. None of the above

571. Read and write capabilities are available in

- a. RAM *
- b. ROM

594. When two in - phase signals are applied the display segments spontaneously relax to
 a. Energized state * b. De-energized state
 c. Saturated state d. Both b. and c. are correct
595. The dynamic scattering display operates on the principle of
 a. Forward light scattering
 b. Backward light scattering
 c. As a. caused due to turbulence ions of liquid crystal
 d. As b. and caused due to turbulence of ions of liquid crystal *
596. For reflective read-out provided light source is
 a. A back - light source *
 b. Ambient light source
 c. 2.5 V light focused from both side
 d. None of the above
597. Additional polarizer plates are provided on front and back glass plate assembly in case of
 a. Dynamic scattering LCD *
 b. Field - effect LCD
 c. Both a. and b. are correct
 d. None of the above
598. Colour effect can be achieved by
 a. Placement of colour film on front surface of display
 b. By colouring reflective surfaces *
 c. Both a. and b. are correct
 d. There is no separate arrangement for colour display
599. A LED emits light when it is
 a. Reverse biased b. Forward biased *
 c. Emitter bias d. None of the above
600. Which cause molecules of liquid crystal to orient themselves in 90° twist configuration between glass plates
 a. Polarizers *
 b. As in a. and with specially prepared inside glass surface
 c. As in a. and epoxy materials filled between glasses
 d. None of the above
601. Servomechanism is a
 a. Close loop control system
 b. As in 'a' and detects difference between an input and an output *
 c. As in 'a' and pilot controls input signal
 d. As in 'a' and pilot controls output signal
602. Which of the following statement is wrong ?
 a. Servomechanism amplify the error signal
 b. Servo loop is closed by feed back
 c. Servo is a open loop control system which does not need feed back *
 d. None of the above
603. Which of the following not coming in main class of servo mechanism
 a. Position control b. Speed control
 c. Frequency control * d. None of the above
604. In case of a position control servomechanism when wiper arm occupy corresponding angular position servo is said to be in
 a. Null position
 b. Zero signal position
 c. Straight and level flight position
 d. Both a. and b. are correct *
605. In case of a speed control servomechanism feedback is taken from
 a. Techogenerator to servomotor
 b. Techogenerator to amplifier *
 c. Load to amplifier
 d. Load to technogenerator
606. The pattern of behaviour of the load when change is made at the input is known as
 a. Servocontrol b. Response to servo *
 c. Feed back to servo d. None of the above
607. When input system is suddenly changed to a new angular position from null position is
 a. Ramp input b. Step input *
 c. Position input d. None of the above
608. When the input is suddenly moved at a constant speed type of input is known as
 a. Ramp input * b. Step input
 c. Position input d. Velocity input
609. Response of sevomechanism is very sluggish if damping is
 a. Light b. Heavy *
 c. Critical d. None of the above
610. The degree of damping which just prevent any over shoot is known as
 a. Light damping b. heavy damping
 c. Critical damping * d. No damping
611. The damping which allows one small overshoot and gives the smallest setting time is known as
 a. Critical damping b. Light damping
 c. Heavy damping d. Optimum damping *
612. Coulomb friction is a type damping particularly relate to
 a. Ramp input b. Step input *
 c. Position input d. None of the above
613. The load come to the rest some what with in a bend of error called
 a. Dead space * b. Tolerance space
 c. Ramp space d. None of the above
614. The viscous friction is associated with
 a. Step input b. Ramp input *
 c. Both a. and b. correct d. None of the above

615. The method of damping where eddy current in rotating disc is employed is called
- Velocity feed back damping *
 - Viscous damping
 - Both a. and b. correct
 - None of the above
616. The damping method where one techogenerator voltage is applied as feed back to the amplifier is
- Velocity feedback damping *
 - Viscous damping
 - Error rate damping
 - All of the above are correct.
617. The out put voltage of techogenerator is
- Proportional to the load velocity
 - As in a. and in opposition to the error signal *
 - As in a. and in phase with the error signal
 - None of the above are correct.
618. In which of the following damping system two technogenerators are used
- Viscose damping
 - Velocity feedback
 - Error rate damping *
 - None of the above
619. Problem of velocity lag exist in which type of damping
- Velocity feedback
 - Error rate *
 - Viscous
 - All above are correct
620. In transient velocity damping the differentiating network connected in
- Load line
 - Velocity feedback signal line *
 - Both a. and b. correct
 - None of the above
621. In case of transient velocity damping, the damping is effective only
- When out put from techogenerator
 - During transient response period *
 - When rate of change in load velocity exist
 - Both b. and c. are correct
622. Phase advance network consist of
- Resistors and capacitor *
 - Techogenerator
 - Electro mechanical damping mechanism
 - None of the above.
623. In case of ramp input the phase advance damping gives
- Positive error
 - Negative error
 - Almost zero error *
 - None of the above
624. The damping system which reduces "Velocity Lag" as well as "dead space" is known as
- Phase advance damping
 - Transient velocity damping
 - Error rate damping
 - Integral damping *
625. Which of the following damping system uses one differentiator and one integrator
- Transient velocity
 - Integral *
 - Error rate
 - Both b. and c. are correct



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CHAPTER - 52

MISCELLANEOUS QUESTIONS ON AIRCRAFT INSTRUMENTS

- Earth's magnetic field and poles remains
 - varying periodically
 - varying irregularly
 - fixed at a point
 - both a. and b.*
- When direction of magnetic meridian inclines to right of the true meridian; it is called
 - Easterly *
 - Westerly
 - Northerly
 - Southerly
- Magnetic field change over long period due to changing position of magnetic poles relative to true pole is termed as
 - Annual change *
 - Secular change
 - Diurnal change
 - Daily change
- An imaginary line joining places having equal magnetic variation is called
 - Isogonal line *
 - Agonic line
 - Aclinic line
 - Isodynamic line
- If a suspended magnet is carried along a meridian; at south pole its
 - Red end will go down *
 - Blue end will go down
 - remains unaffected
 - None of these
- the angle the magnetic lines make with earth's surface at any given place is called
 - Magnetic inclination
 - Angle of dip
 - Magnetic deviation
 - Both a. and b.*
- Angle of dip of magnetic equator will be
 - 0° *
 - 90°
 - 45°
 - 180°
- Angle of dip remains same at the places coming in line known as
 - Isoclinic line *
 - Aclinic line
 - Magnetic inclination line
 - Agonic line
- Places coming in line, having zero magnetic dip is known as
 - Isogonal line
 - Agonic line
 - Isodynamic line
 - Aclinic line *
- Reading of Direct Reading compass is read against
 - Index mark
 - Lubber line *
 - Reference mark
 - Rubber line
- Mechanism of Direct Reading compass is pendulously suspended
 - Platinum tipped pivot
 - Cobalt tipped pivot
 - Iridium-tipped pivot *
 - Steel tipped pivot
- Pivot point of magnet system of Direct Reading compass is at
 - Centre of gravity
 - Above centre of gravity *
 - Below centre of gravity
 - None of these
- Bowl of the Direct Reading compass is made of
 - Diakon plastic *
 - Cellulose plastic
 - Glass
 - None of these
- To compensate the expansion of fluid due to change in temperature the device used in Direct Reading compass
 - Bowl
 - Fluid
 - Bellow *
 - Both a. and b.
- The minimum distance at which equipment may be safely positioned from compass exceeding specified values of design is known as
 - Magnetic safe distance
 - A/C safe distance
 - Compass safe distance *
 - Both a. and b.
- Main errors in a Direct Reading compass are Turning error and
 - Acceleration error *
 - Compressibility error
 - Magnetic error
 - Both a. and b.
- Error caused due to swinging outward and rotation of the magnet system of Direct Reading compass is known as
 - Turning error *
 - Acceleration error
 - Deceleration error
 - Both a. and b.
- What is the purpose of the fluid used in the DR compass
 - to make the compass aperiodic
 - reducing weight on pivot point
 - diminishing the effect of friction and wear of pivot point
 - all of the above *

19. Liquid used in the DR compass can have maximum expansion of
- 10%
 - 15%
 - 8%
 - 12% *
20. Magnet used in the DR compass is
- annuler cobult magnet
 - steel magnet
 - annuler cobult steel magnet *
 - cobult magnet
21. What will be the deviation if aircraft decelarate at northern hemisphere at southerly heading
- easterly deviation
 - southerly deviation
 - no deviation *
 - deviation depends on rate of decelaration
22. At the northern hemisphere aircraft accelerating towards east that time compass will give a apparent turn to
- north
 - east
 - as in a) and it is called easterly deviation *
 - as in b) and it is called northerly deviation
23. Daily change of magnetic deviation is called
- secular change
 - diurnal change
 - daily change
 - as in b) or c) is correct *
24. Liquid filled in the DR compass is
- alcohol
 - silicon fluid
 - oil
 - as in a) or b) is correct *
25. Compass safe distance for a DR Compass is
- 2 c.m. from compass system
 - 1 c.m. from compass system
 - a distance which causing compass diflection maximum 2 degree *
 - a distance which causing compass diflection 1 dgeree
26. Detector element of a remote reading compass is
- fixed type
 - movable type
 - as in a) and detects the earth magnetic field
 - as in c) and it is electro magnetically induced voltage.*
27. Detector elements acts as
- transformer principle *
 - transducer operation
 - transmitter principle
 - as in c) and it act as a/c synchro transmitter.
28. Detector element is taking the form of a
- three-spoked non metal wheel each spoke 120° apart
 - four-spoked metal wheel each spoke 90° apart
 - three spoked metal wheel each spoke 120° apart *
 - none is correct
29. All the spokes are collecting flux
- together
 - individually *
 - both correct
 - none is correct
30. Primary winding of the coil of flux detector
- around the spokes
 - around hub *
 - either of them
 - both of them
31. Primary winding of the coil is in
- vertical axis *
 - lateral axis
 - horizontal axis
 - longitudinal axis
32. The basic components of an RR compass
- flux detector, amplifier , rate, gyro, indicator
 - flux detector, gyro, slaving system, magnetic indicator
 - flux detector, amplifier with slaving and precession device, gyro and indicator *
 - all are correct
33. Gyro used in relation to RR compass is a
- artificial horizon
 - directional gyro *
 - vertical axis gyro
 - rate gyro
34. In detector element primary coil electrical supply is
- 26 V 400 c/s AC
 - 115 V 400 c/s 1 ϕ AC
 - 23.5 V 400 c/s AC *
 - 28.5 V 400 c/s AC
35. Magnetic flux passing through the detector element coil maximum when it aligns
- right angle with the earth magnetic field
 - direction with field is same *
 - 120° angle with field
36. Out put voltage frequency from secondary coil of detector elements is
- 400 c/s
 - 30 c/s
 - 800 c/s *
 - 500 c/s
37. Amplitude of voltage output from pick off coil is
- 28V
 - inversly proportional to earth magnetic component
 - directly proportional to earth magnetic component *
 - both a) and c)
38. Each spoke of detector element having
- secondary windings wound around each leg *
 - secondary winding wound around both legs
 - none of these
39. Each spokes are made such that each leg
- electrically connected to each other
 - magnetically insulated

- c. electrically insulated *
d. both a) and b) are correct
40. Spokes are made of
a. permanent alloy b. permalloy *
c. permanent magnet d. part alloy
41. Axis of detector element
a. parallel to earth's horizontal magnetic component
b. perpendicular to earth's horizontal magnetic component *
c. depends on a/c attitude
d. a) and c) both are correct
42. Detector element suspended
a. pendulously
b. as in a) with 90° freedom in azimuth
c. as in a) with freedom in roll and pitch
d. as in c) 0° freedom in azimuth *
43. "Nutation" in relation to RR compass gyro is
a. "Wobbling" effect of gyro
b. "Spin down" braking process
c. "Spin down braking" prevent nutation
d. both a) and c) are correct *
44. Gyro torque motor in RR compass
a. 3ϕ induction motor
b. 2ϕ induction motor
c. stator at outer gimble ring and rotor at case *
d. both b) and c) are correct
45. RR compass system have two modes of operation
a. at slaved mode only gyro operation
b. at slaved mode gyro monitored by flux detector *
c. at 'DG' mode gyro monitored by flux detector
46. At 'DG' mode of operation
a. gyro stop running
b. flux detector do not pick up signal
c. gyro drifts $15^\circ / \text{hr.}$ *
47. Synchronizing indicators in RR compass is
a. connected to gyro slaving circuit
b. actuated by monitoring signals from the detectors
c. both a) and b) are correct *
d. none of the above
48. When annunciator shows either cross or dot only continuously it shows
a. slaving circuit fails *
b. precession circuit fails
c. no signal from flux detector
d. all are correct
49. Under synchronised condition what actually visible in annunciator windows
a. oscillating dot or cross
b. as in a) due to redundancy of flux detector *
c. as in a) due to gyro wander
50. Precession rate of gyro is
a. $5^\circ / \text{min.}$ b. 1° to 2° per 3 min
c. 5° in 3 min.* d. both a & b are correct
51. Compass base site is at least _____ distant from hangers and steel framed building.
a. 50 mtrs b. 50 ft
c. 50 yards * d. 100 mtrs
52. Base should be marked at
a. Nose wheel turning circle
b. Base center
c. Not necessary marking the base
d. Both (a) and (b) is correct *
53. Building containing electrical power generation should be _____ distance from compass base side.
a. 50 yards b. 100 meters
c. 50 yards d. 100 yards *
54. The datum compass circle on the grass must be marked with
a. Paint b. Iron strip
c. Gravel & Tarmac * d. Tarmac
55. Marking on the compass base on concrete is done by
a. Paint * b. Cement
c. Marble d. Any one
56. If the base is to be used for carrying out "electrical survey" a line should be painted indicating
a. North-south *
b. East-west
c. Southeast- Northwest
d. None of the above
57. Compass base is chosen to
a. Survey the compass
b. Swinging a/c compass *
c. Fit the compass system an aircraft
d. None
58. Compass base must be free from
a. Local magnetic field * b. Earth magnetic field
c. All of above d. None of above
59. Compass base classified as
a. First class base b. Second class base
c. Class 1 and class 2 * d. None
60. Maximum permissible deviation is ± 1 degree at
a. Class 1 base * b. First class base
c. Second class base d. None
61. Swinging of aircraft with MHRS system is carried out on
a. Class 2 base b. Class 1 base *
c. First class base d. None

62. Maximum permissible deviation allowed in class-2 base is
 a. ± 15 degree b. ± 1.5 degree
 c. $\pm .25$ degree d. ± 2.5 degree *
63. Class 2 base is used for carrying out
 a. Standard swinging * b. Refined swinging
 c. Any swinging d. None
64. Direct reading compass swinging can be carried out at base with deviation
 a. Less than ± 2.5 degree *
 b. $\pm .25$ or more
 c. $\pm .25$ degree less than
 d. None
65. Swinging of RR compass as main and DR compass as standby can be carried out at
 a. Class 2 base * b. Class 1 base
 c. Any base d. None
66. Initial survey of base carried out by
 a. Operator b. Owner
 c. Operator or AAI * d. None
67. Establishment survey is carried out by
 a. Operator or AAI
 b. Operator or AAI or ACO if appropriate *
 c. Only ACO is recommended
 d. None
68. Periodic resurvey of class 1 base carried out
 a. Every 2 years b. Yearly
 c. Every five years * d. (a) and (b)
69. In every two years resurvey carry out in
 a. Class 1 base b. Class 2 base *
 c. First class base d. None
70. ACO will survey class 2 base if possible in
 a. Every 5 year b. Every 2 year
 c. Every 6 years d. Every 7 years *
71. Bases are checked annually to determine
 a. Any extra deviation
 b. Markings *
 c. Added magnetic interference
 d. None
72. Change in magnetic variation can be obtaining by
 a. Annual check * b. Daily check
 c. Snap check d. Both (a) and (b)
73. Area survey is to carry out
 a. Check swing b. Magnetic swing
 c. Electrical swing * d. All of above
74. Standard of survey set by
 a. Ministry of civil aviation
 b. Admiralty compass observatory *
- c. AAI
 d. DGCA
75. Survey method used to survey compass base is
 a. Reciprocal bearing method *
 b. Distant bearing method
 c. All of above
 d. None
76. High pressure gaseous oxygen system pressure is minimum
 a. 1500 PSI b. 1800 PSI *
 c. 2500 PSI
77. High pressure oxygen cylinder should be painted
 a. green and marked aviators breathing oxygen in white
 b. as in (a) and with letters of 1" thickness *
 c. black colour and white letters marking oxygen
78. What will cause in case of excessive filling rate of oxygen
 a. cause pressure surge and heating up the system*
 b. pressure surge cause heat up transport cylinder
 c. cool down the system
79. Gaseous oxygen bottle tested in every
 a. three to five years * b. 5 to 10 years
 c. 7 yaers
80. Continuous flow system of oxygen pilot provided with
 a. same oxygen as passengers
 b. twice of the passengers *
 c. less than passengers
81. Continuous flow system mask used with
 a. rebreather bag * b. breathing bag
 c. re-use bag
82. In rebreather bag supply oxygen mixed with
 a. exhaled air * b. cabin air
 c. atmospheric air
83. In a continuous flow system "no flow" of oxygen is indicated by
 a. no indication b. white indication
 c. red indication *
84. In diluter demand system how air and oxygen mixing is controlled
 a. barometric control *
 b. electrically controll
 c. there is no such provision
85. Diluter demand system 100% selection will provide
 a. 100% air b. 100% cabin air
 c. 100% oxygen *
86. Emergency position of regulator
 a. provide oxygen to mask with positive pressure

- b. provide 100% oxygen to mask with positive pressure *
- c. provide 100% oxygen on demand
87. High pressure oxygen cylinder should be approved by
- department of transportation (DOT) or inter state commerce commission (ICC) *
 - DGCA or DOT
 - DGCA or ICC
88. Specification number of the cylinder mfg date, pressure test date marked on cylinder
- neck *
 - bottom
 - side
89. Oxygen system cleaning and flushing of newly fabricated oxygen system can be carried out by
- trichloro ethylene *
 - petroleum cleaner
 - solder solution
90. Leak test of the newly fabricated oxygen system is done by
- soap water *
 - water
 - solder solution
91. Thread lubrication of oxygen system during fabrication is done by
- taflon type *
 - grease
 - silicon grease
92. In case of diluter demand system
- oxygen is diluted by means of
 - by means of cabin air *
 - excess air by user
 - atmospheric air
93. Removing moisture from the oxygen system with the help of pure oxygen is called
- purging *
 - charging
 - surging
94. Oxygen thermal discharge is indicated by
- green over board discharge disc displaced *
 - red disc displaced
 - red indication comes in place of green
95. The residue left when a chemical oxygen generator releases its oxygen is
- metallic sodium
 - a toxic & corrosive powder
 - common salt *
96. What happens when a pressure demand regulator control is placed in the test mask position
- no flow of oxygen
 - 100% oxygen with slight Pr. and shut off when release *
 - pr. breathing deactivated
97. What type of pressure test is used to determine the suitability of oxygen cylinder
- hydrostatic test *
 - by compressed air tested
 - tested by oxygen
98. When filling a gaseous oxygen cylinder upto 1800 PSI at 70°F. If the temperature is 90°F system should be filled upto
- exactly 1800° PSI only
 - more than 1800° PSI *
 - less than 1800° PSI
99. Chemical oxygen supply has storage life of
- five years
 - ten years *
 - 2 years
100. Chemical oxygen can be activated by
- a percussion cap
 - electrical squib
 - both of them *
101. The direction in which aircraft is moving over the earth is
- track *
 - heading
 - desired track
102. What is the basis of inertial navigation system
- stability
 - acceleration *
 - rigidity
103. In INS acceleration signal is supplied to which circuit to get distance
- one integrator circuit
 - two integrator circuit *
 - A/D converter
104. What type of gyro is used for gyro stabilized platforms in INS
- earth gyro
 - air driven gyro
 - rate gyro *
105. Why two roll gimbals are oriented in gimballed platform arrangement
- two inter lock gimbals
 - to provide gimbal rotation
 - to prevent gimbal lock *
106. The angular movement of inner roll (IR) gimbal in gimballed platform arrangement is limited to
- $\pm 20^\circ$
 - 20°
 - $\pm 10^\circ$ *
107. Outer roll torque motor in gimballed platform in INS is fixed to
- pitch gimbal
 - IR gimbal
 - INU casing *
108. Servomotor mounted on Azimuth (Z) platform rotates
- (x-y) platform *
 - Z platform
 - IR gimbal
109. Azimuth torque motor drives Z platforms mounted on
- IR gimbal *
 - pitch gimbal
 - Z platform
110. Torque motor fixed to pitch gimbal is
- pitch torque motor
 - inner roll (IR) torque motor *

- c. pitch platforms
111. Battery unit of INS
 a. provide DC power for turning on the system
 b. Back up for aircraft power failure
 c. no battery required
 d. both a) and b)*
112. Battery charger unit in INS is fitted to
 a. INU *
 b. battery unit
 c. A/C emergency battery compartment
113. In case of AC power failure battery will provide power for
 a. 30 min. b. 15 min.* c. 10 min.
114. Battery in use indication is
 a. blue 'BATTERY' light
 b. yellow 'BATT' light
 c. amber 'BATT' light *
115. Battery supply during starting remains for
 a. 10 sec.* b. 10 min. c. 1 min.
116. When on ground external power supply is disconnected with INS on how battery power transfer warning will appear.
 a. red warning light b. horn activated *
 c. both a) and b)
117. Battery charger automatically operated when INS battery
 a. voltage is below 26.5V and not in operation *
 b. voltage below 26.5 V and operating condition
 c. voltage above 26.5V and operating condition
118. In STBY (Stand by Mode)
 a. INS works as usual
 b. INS not affected by aircraft movement *
 c. Its used for alignment only
119. When alignment is completed
 a. amber 'READY NAV' light comes on
 b. green 'READY NAV' light comes on *
 c. amber 'READY NAV' light extinguish
120. No movement of air craft permitted in which mode
 a. STBY b. ALIGN * c. NAV
121. When NAV mode selected
 a. green 'READY NAV' light extinguish *
 b. amber 'NAV' light comes up
 c. Red 'NAV' light comes up
122. What selection on CDU is made when computer failed
 a. STBY b. ATT REF * c. ALIGN
123. "ATT REF" mode
 a. enable attitude mode
 b. disable navigation capability *
- c. Enable ALIGN mode
124. To prevent NAV mode from being inadvertently switched out a stop provided between
 a. ALIGN and NAV
 b. STBY & ATT
 c. NAV and ATT *
125. Red BATT light illuminated when battery voltage
 a. below 26V and not in use
 b. below 20 V and in use
 c. below 18 V and in use *
126. Why "STBY" mode is not required in IRS System ?
 a. Gyro used in IRS is always in running condition
 b. RLG used in IRS not require warmup time *
 c. No Gyro is used in IRS
127. White light in IR mode panel indicate
 a. OPS mode b. ALIGN mode *
 c. FAIL mode d. NAV mode
128. Flashings of white light on IR mode panel indicate
 a. ALIGN mode
 b. ALIGN mode failure
 c. ALIGN procedure failure *
 d. none of above
129. "DC FAIL" light illuminates on
 a. when aircraft battery power to IRS drops below 18 V.
 b. as in (a) colour of light is red
 c. as in (a) colour of light is amber *
 d. none of the above
130. "ON DC" light illuminates when
 a. During normal operation
 b. Power supply changed from 115 V AC to 28 V dc
 c. As in (a) and colour is white
 d. As in (b) and colour is amber *
131. In "strap down" configuration gimballed platform functionally replaced by
 a. Fixed mounting
 b. Anti Vibration mounting
 c. Mathematical equations programmed in configuter *
 d. Computer operated gyro.
132. If operating temperature is not reached in a system and mode selection mode from STBY to ALIGN display will show
 a. STBY
 b. Sub mode-9
 c. as in (b) and this mode equivalent to stand by mode *
 d. only (a) & (b)
133. The procedure of moving the gimballed platform on INS to simulate in-flight attitude is known as
 a. strap down b. Slewing *

