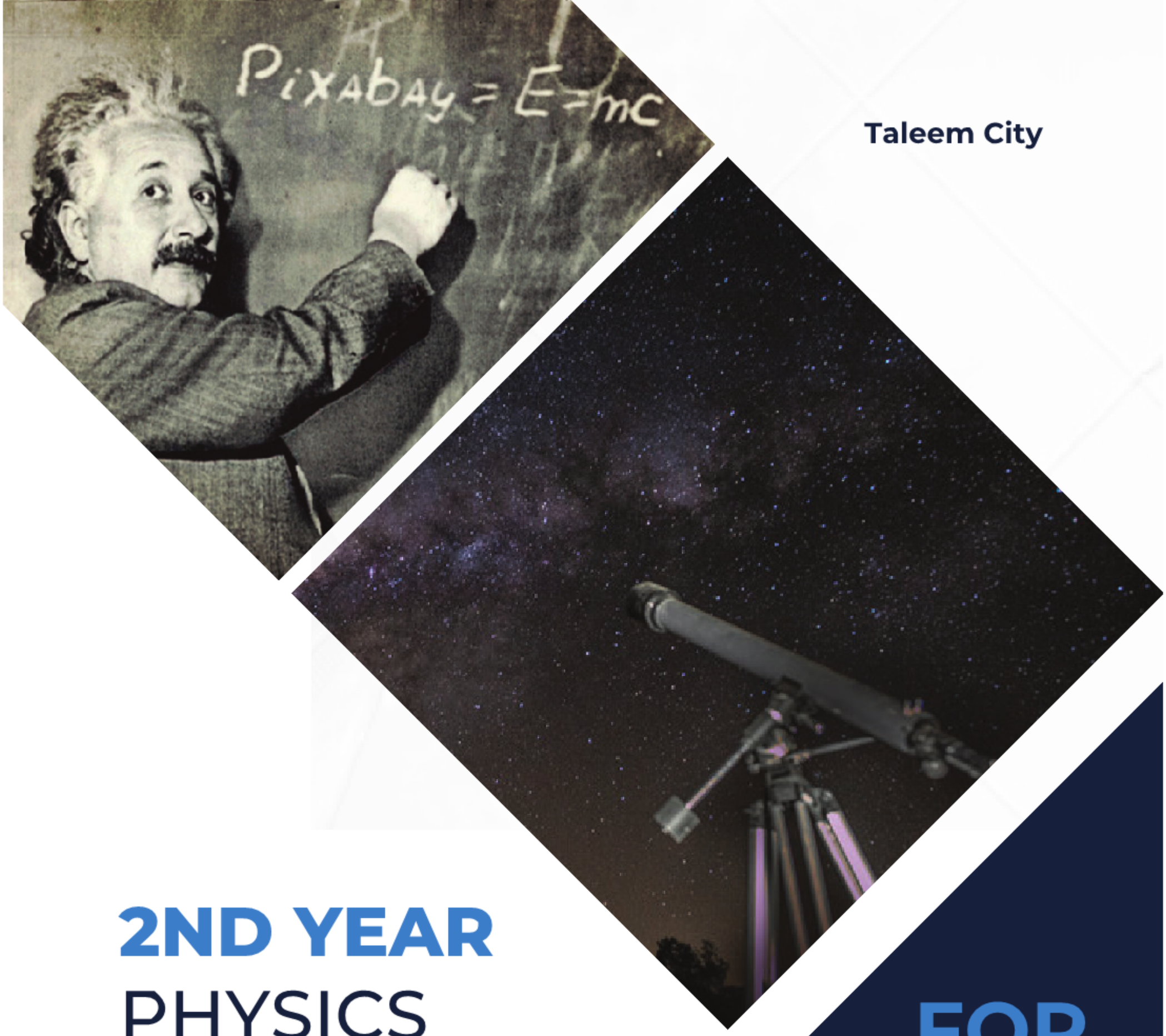


Taleem City

2ND YEAR PHYSICS SOLVED MCQS

taleemcity.com

FOR PUNJAB BOARDS

Catalog

ELECTROSTATICS

Each question has four possible answers, tick (✓) the correct answer:

1. The Coulomb force is:

(a) $F = K\frac{q_1 q_2}{r^2}$ **(b)** $F = K\frac{q_1 q_2}{r}$

(c) $F = K\frac{q_1 q_2}{r^3}$ **(d)** $F = K\frac{q_1 r^2}{q_2}$

2. The value of K depends upon:

(a) Charges **(b)** System of units and medium

(c) The distance between charges **(d)** Nature of medium

3. The value of K in SI system of units:

(a) $9 \times 10^9\ Nm^2/c^2$ **(b)** $9 \times 10^{10}\ Nm^2/c^2$

(c) $9 \times 10^{-9}\ Nm^2/c^2$ **(d)** $9 \times 10^9\ NC/m^2$

4. The branch of physics which deals with the charges at rest:

(a) Current electricity **(b)** Electromagnetism

(c) Electrostatics **(d)** Nuclear physics

5. The value of permitivity of free space:

(a) $8.85 \times 10^{-12}\ C^2/Nm^2$ **(b)** $8.85 \times 10^{-12}\ C^2m^2/N$

(c) $8.85 \times 10^{-12}\ Nm^2/C$ **(d)** $8.85 \times 10^{-11}\ Nm^2/C^2$

6. When the medium is insulator the electrostatic force between the charges is:

(a) Decreased **(b)** Zero

(c) Increased **(d)** None of above

7. What is standard to measure the relative permitivity:

(a) Water **(b)** Vacuum

(c) Air **(d)** Atmosphere

8. Which of the following statement is correct:

(a) Similar charges attract each other **(b)** Similar charges attract and repel each other

(c) Similar charges repel each other **(d)** Similar charges neither attract nor repel

9. Metals are good conductors of electricity because they have:

(a) Large number of bounded electrons **(b)** Small number of electrons

(c) Large number of free electrons **(d)** Small number of free electrons

10. Free electrons are:

(a) Fixed **(b)** Loosely bounded

(c) Strongly fixed **(d)** Tightly bound

11. The SI unit of charge is:

(a) Coulomb **(b)** Calorie

(c) Ampere **(d)** Joule

12. The number of electrons in one coulomb charge is equal to:

(a) 6.2×10^{18} electrons **(b)** Zero electrons

(c) 1.6×10^{-22} electrons **(d)** 6.2×10^{21} electrons

13. The electrostatic force of repulsion between two electrons at 1 metre is:

(a) 9×10^{9} N **(b)** 1.44×10^{-9} N

(c) 2.30×10^{-28} N **(d)** 1 N

14. A charge of 10μC and 14.4 μC are 12 cm apart, the force between them is:

(a) 9×10^{5} N **(b)** 9×10^{7} N

(c) 90 N **(d)** 108×10^{7} N

15. A substance contains:

(a) Only positive charge **(b)** Only negative charge

(c) Both +ve and –ve charge **(d)** None of above

16. If the distance between the two charge bodies is halved, the force between them becomes:

(a) Half **(b)** Four time

(c) One fourth **(d)** Doubled

17. The SI units of permitivity are:

(a) $N.m/C^2$ **(b)** $C^2/N.m^2$

(c) $N.m^2/C^2$ **(d)** N.m/C

18. The minimum charge on any electron be less than:

(a) 1.6×10^{-19}C **(b)** 3.2×10^{-19}C

(c) 1.8×10^{-19}C **(d)** 9.1×10^{-19}C

19. The force in a medium of relative permitivity $\in_r$ is given by:

(a) $F' = \frac{F}{\in_r}$ **(b)** $F' = \frac{\in_r}{F}$

(c) $F' = \in_r . F$ **(d)** $F' = \frac{F}{\in_o \in_r}$

20. When current of one ampere is flowing across any cross-section of wire in one second, then the quantity of charge is said to be:

(a) One coulomb **(b)** Three coulomb

(c) One micro-coulomb **(d)** None of above

21. The electric force between two charges placed in air is 2 Newton. When placed in a medium of $\in_r = 80$, the force reduced to:

(a) 0.029 N **(b)** 0.025 N

(c) 0.03 N **(d)** 0.04 N

22. The value of $\in_r$ for various dielectrics is always:

(a) Larger than unity **(b)** Less than unity

(c) Equal to unity **(d)** None of above

23. A metallic hallow sphere of 8cm diameter is charged with 4×10^{-8}c. The potential on its surface will be:

(a) 90 volts **(b)** 9 volts

(c) 9000 volts **(d)** 900 volts

24. Origin of the gravitational and electric forces:

(a) is still unknown **(b)** was known in 1611 A.D

(c) was known in 1712 A.D **(d)** was known in 1911 A.D

25. Michael Faraday was known by his work on:

(a) Electric force **(b)** Weak nuclear force

(c) Strong nuclear force **(d)** Gravitational force

26. The SI unit of charge is:

(a) Meter **(b)** Ampere

(c) Coulomb **(d)** Volt

27. In case of two identical charges placed at certain distance, the electric lines of force are:

(a) Curved **(b)** Straight lines

(c) Both (a) and (b) **(d)** None of these

28. An example of photoconductor is:

(a) Iron **(b)** Aluminum

(c) Carbon **(d)** Selenium

29. Selenium is:

(a) Conductor

(b) Insulator in the dark are becomes conductor when exposed to light

(c) An insulator

(d) None of these

30. The inkjet printer ejects a thin stream of:

(a) Ink **(b)** Water

(c) Oil **(d)** None of these

31. An important part of inkjet printer is:

(a) Deflection plates **(b)** Toner

(c) Drum **(d)** None of these

32. An inkjet printer uses in its operation:

(a) Positrons **(b)** Neutrons

(c) An electric charge **(d)** Photons

33. The photo copying process is called:

(a) Xerography **(b)** Inkjet printer

(c) Both (a) and (b) **(d)** None of these

34. An important port of a photocopier is:

(a) Deflation plates **(b)** Toner

(c) Charging electrode **(d)** Printed head

35. Xerography means:

(a) Dry writing **(b)** Wet writing

(c) Both (a) and (b) **(d)** None of these

36. The number of electric field lines passing through a certain element of area is called:

(a) Electric lines of force **(b)** Electric intensity

(c) Electric flux **(d)** None of these

37. The concept of electric field theory was introduced by:

(a) Kepler **(b)** Newton

(c) Dalton **(d)** Michael Faraday

38. The space around the charge within which other charges are influenced by it is called:

(a) Electric field **(b)** Magnetic field

(c) Electric flux **(d)** Electric intensity

39. The force per unit charge is called:

(a) Electric field **(b)** Electric field intensity

(c) Electric potential energy **(d)** Electric potential

40. The electric field exist around:

(a) Charges **(b)** On the left side

(c) At the –ve charge **(d)** At the +ve charge

41. The practical application of electrostatic is:

(a) Photocopier **(b)** X-rays machines

(c) Laser **(d)** All of above

42. The electric field lines emerge from the charges in:

(a) Three dimensions **(b)** Two dimensions

(c) One dimension **(d)** All of above

43. The direction of electric intensity is:

(a) Normal to the field **(b)** Tangent to the field

(c) Parallel to the field **(d)** None of above

44. When the field is strong, the lines of force are:

(a) Closer **(b)** Parallel

(c) Farther **(d)** All of above

45. The electric lines of force determine the strength of an:

(a) Gravitational field **(b)** Constant field

(c) Magnetic field **(d)** Electric field

46. The electric intensity is a:

(a) Scalar quantity **(b)** Vector quantity

(c) Physical quantity **(d)** None of above

47. The unit of electric intensity is:

(a) C/m^2 **(b)** N/C

(c) Volt – meter **(d)** Both (b) and (c)

48. A charge of 2 coulomb is in a field of intensity 2 N/C. The force on charge is:

(a) 4π N **(b)** 4 N

(c) 0 N **(d)** 1 N

49. The electric intensity at a distance of 1m from the point charge is 1μC is:

(a) 9×10^9 N/C **(b)** 9×10^6 N/C

(c) 9×10^3 N/C **(d)** 9 N/C

50. The total number of lines of force passing out of any closed surface is equal to:

(a) $4\pi\epsilon_0$ **(b)** $\frac{1}{4\pi\epsilon_0}$

(c) $\frac{1}{\epsilon_0} \times Q$ **(d)** $\frac{1}{\epsilon_0 Q}$

51. Another term used to mean electric lines of force is:

(a) Electric field **(b)** Permitivity

(c) Electric flux **(d)** Equipotentials

52. The electric flux is given by the expression:

(a) $\phi = \vec{E} \cdot \vec{A}$ **(b)** $q = \vec{E} \cdot \vec{A}$

(c) $\phi = \vec{E} \cdot \vec{Q}$ **(d)** $V = \vec{E} \cdot \vec{d}$

53. Electric flux is a:

(a) Vector quantity **(b)** Scalar quantity

(c) Both (a) and (b) **(d)** None of above

54. The SI unit of electric flux is:

(a) Nm^2/C^2 **(b)** Nm/C^2

(c) Nm^2/C **(d)** Nm/C

55. The formula $\phi = \vec{E} \cdot \vec{A}$ is applied when the area is:

(a) Flat **(b)** Curve

(c) Rounded **(d)** Spherical

56. The electric lines of force are directed away from:

(a) Positive charge **(b)** Negative charge

(c) Both +ve and –ve **(d)** None of above

57. The magnitude of electric intensity due to a point charge q at a distance r in free space is given by:

(a) $E = \frac{1}{4\pi\in_o} \frac{q}{r^2}$ **(b)** $E = 4\pi \in_o \frac{q}{r^2}$

(c) $E = \frac{1}{4\pi\in_o} \frac{q^2}{r^2}$ **(d)** $E = \frac{1}{4\pi\in_o} \frac{q}{r}$

58. The electric intensity at infinite distance from the point charge is:

(a) Infinite **(b)** Zero

(c) Positive **(d)** Negative

59. The number of electric lines of force passing through certain area is known as:

(a) Electric intensity **(b)** Electric field

(c) Electric flux **(d)** All of above

60. The electric flux through any surface depends upon:

(a) Area of surface **(b)** Direction of surface

(c) Electric intensity **(d)** All of above

61. In $\phi_e = EA \cos\theta$, the angle θ is the angle between the field lines and:

(a) Vector Area **(b)** Electric intensity

(c) Potential **(d)** None of these

62. The surface charge density is defined as:

(a) Charge per unit volume **(b)** Charge per unit mass

(c) Mass per unit area **(d)** Charge per unit area

63. If σ is the surface charge density and A is the area of Gaussian surface then charge enclosed by it is:

(a) $\frac{A}{\sigma}$ **(b)** $\frac{\sigma}{A}$

(c) σA **(d)** σ-A

64. If $\vec{E} = \frac{\sigma}{2\epsilon_o}\hat{r}$, the unit vector $\hat{r}$ is:

(a) Shows the direction of electric intensity **(b)** Directed from negative to positive plate

(c) Directed towards the positive plate **(d)** None of these

65. The electric intensity due to two oppositely charged plates is:

(a) $\vec{E} = \frac{\sigma}{\varepsilon_0}\hat{r}$ **(b)** $\vec{E} = \frac{\varepsilon_0}{\sigma}\hat{r}$

(c) $\vec{E} = \sigma\,\sigma_0\,\hat{r}$ **(d)** None of these

66. The interior of a hollow charged metal sphere is a region which is:

(a) Full of electric field lines **(b)** Field free region

(c) Both (a) and (b) **(d)** None of these

67. Gauss's Law can only be applied to:

(a) Surface of any shape **(b)** Plane surface

(c) Closed surface **(d)** A curved surface

68. According to Gauss's law, the flux through the closed surface is:

(a) $\frac{Q}{\epsilon_0}$ **(b)** $\frac{E}{\epsilon_0}$

(c) $\frac{E}{\epsilon_0}$ **(d)** $\frac{A}{\epsilon_0}$

69. Intensity of field inside a Hallow charged sphere is:

(a) Minimum **(b)** Maximum

(c) Zero **(d)** All of above

70. The electric intensity due to infinite sheet of charge is:

(a) $E = \frac{\sigma}{2\epsilon_0}$ **(b)** $E = \frac{\sigma}{\epsilon_0}$

(c) $E = \frac{\sigma}{2\epsilon_0\epsilon_r}$ **(d)** $E = \frac{2\sigma}{\epsilon_0}$

71. Which one of the following is taken as the measure of electric intensity?

(a) $E = \frac{\phi}{A}$ **(b)** $E = \frac{\phi \in_0}{A}$

(c) $E = \frac{q}{\in_0 A}$ **(d)** $E = \frac{F}{A}$

72. Work done in moving a charge (unit positive charge) from one point to another against the electric field is measure of:

(a) Electric potential **(b)** Potential difference

(c) Electric intensity **(d)** Absolute potential

73. The SI unit of potential difference is:

(a) Volt **(b)** Ampere

(c) Joule **(d)** $\frac{\text{Volt}}{\text{Metre}}$

74. Another name for electric potential energy per unit charge is:

(a) Electric intensity **(b)** Electric potential

(c) Electric force **(d)** Electric flux

75. Work done in bringing a unit positive charge from infinity to that point in an electric field is:

(a) Resistance **(b)** Capacitance

(c) Absolute potential difference **(d)** Electric potential

76. If an electron of charge "e" is accelerated a potential difference V it will acquire energy:

(a) Ve **(b)** $\frac{v}{e}$

(c) $\frac{e}{v}$ **(d)** Ve^2

77. Electric potential is:

(a) Vector quantity **(b)** Neither scalar non vector

(c) Scalar quantity **(d)** None of above

78. Another unit of electric intensity can be expressed as:

(a) $\frac{\text{Volt}}{\text{Meter}}$ **(b)** $\frac{\text{Ampere}}{\text{Meter}}$

(c) $\frac{\text{Meter}}{\text{Volt}}$ **(d)** $\frac{\text{Volt}}{\text{Coulomb}}$

79. In a region where the electric field is zero the electric potential is always:

(a) Negative **(b)** Positive

(c) Zero **(d)** Constant

80. An electron volt is the unit of a:

(a) Potential **(b)** Electric potential energy

(c) Charge **(d)** Power

81. The negative of the potential gradiant is:

(a) Electric intensity **(b)** Potential energy

(c) Voltage **(d)** Electrostatic force

82. The change of potential w.r.t displacement is called:

(a) Electric potential **(b)** Electric intensity

(c) Potential gradient **(d)** None of these

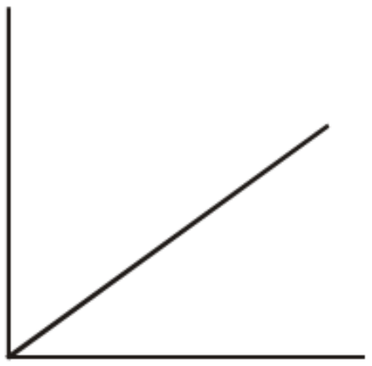
83. Coulomb multiplied by volt gives the unit called:

(a) Ohm **(b)** Bolt

(c) Ampere **(d)** Joule

84. The variation of electric potential due to a point charge with distance is represented by the graph:

(a)



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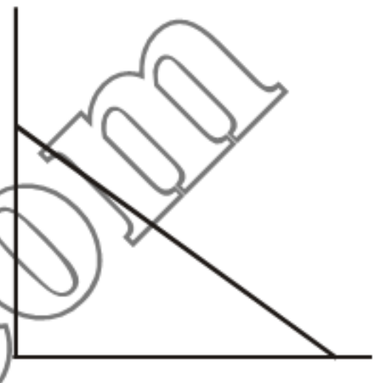

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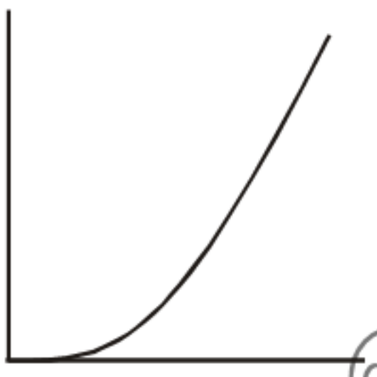


(d)

85. Which of the following forces are conservative:

(a) Electric force **(b)** Gravitational force

(c) Frictional force **(d)** Both (a) and (b)

86. Which of the following forces is only repulsive:

(a) Electrostatic force **(b)** Gravitational force

(c) Storing nuclear force **(d)** None of these

87. The unit of F_e/F_g is:

(a) No unit **(b)** Coulomb

(c) Newton **(d)** None of these

88. The Millikan's experiment apparatus also contains:

(a) An atomizer **(b)** Lens

(c) Microscope **(d)** All of above

89. If a oil droplet between two oppositely charged parallel plates is suspended then:

(a) $F_g > F_e$ **(b)** $F_g < F_e$

(c) $F_g = F_e$ **(d)** None of these

90. The charge on the electron was measured by Millikan in:

(a) 1909 **(b)** 1905

(c) 1900 **(d)** 1910

91. If electric and gravitational forces on an electron placed in a uniform electric field balance each other then electric intensity will be:

(a) $E = \frac{q}{mg}$ **(b)** $E = \frac{mg}{q}$

(c) $E = \frac{q}{qm}$ **(d)** $E = \frac{m}{qg}$

92. The charge an the droplet in Millikan's experiment is calculated by using the formula:

(a) $q = \frac{mg}{dV}$ **(b)** $q = \frac{dV}{mg}$

(c) $q = \frac{mg}{dg}$ **(d)** $q = \frac{mgd}{V}$

93. The radius of the droplet in Millikan's experiment is found by the formula:

(a) $r = \sqrt{\frac{2\rho g}{9\eta v_t}}$ **(b)** $r = \sqrt{\frac{9\eta v_t}{2\rho g}}$

(c) $r = \sqrt{\frac{9\rho g}{2\eta v_t}}$ **(d)** $r = \sqrt{\frac{9\eta g}{2\rho\ v_t}}$

94. The symbol $\in_r$ denotes for:

(a) Relative permitivity **(b)** Dielectric constant

(c) Both (a) and (b) **(d)** None of these

95. In a charged capacitor, the energy is stored due to:

(a) Positive charge **(b)** Electric field between the plates

(c) Negative **(d)** None of these

96. The relative permitivity of air is:

(a) 79.5 **(b)** 1.006

(c) 1.06 **(d)** 1.0006

97. In case of a parallel plate capacitor, $\frac{1}{2} \in_r \in_0 E^2$ gives:

(a) Energy density **(b)** Energy per unit volume

(c) Energy stored in a capacitor **(d)** Both (a) and (b)

98. The formula for energy density is valid for only:

(a) At points of high field strength **(b)** At points of low field strength

(c) At points of inter mediate field strength **(d)** At all points

99. The dielectric consists of atoms and molecules which are:

(a) Positively charged **(b)** Negatively charged

(c) Neutral on the average **(d)** None of these

100. The voltage across the capacitor at any instant can be obtained by:

(a) Dividing q by C **(b)** Dividing C by q

(c) Multiply q by C **(d)** None of these

101. The unit of time constant is the product of:

(a) Farad and ohm **(b)** Coulomb and joule

(c) Farad and watt **(d)** Coulomb and watt

102. A radio tunning capacitor is a:

(a) Cylindrical capacitor **(b)** Spherical capacitor

(c) Parallel plate capacitor **(d)** None of these

103. The potential at a point situated at a distance of 50 cm from a charge of 5μc is:

(a) 9×10^4 volts **(b)** 9×10^2 volts

(c) 9×10^{-2} volts **(d)** 9×10^{-4} volts

104. The earth's potential is considered as:

(a) Negative **(b)** Positive

(c) Zero **(d)** Infinite

105. The interior of a hollow charged sphere is a:

(a) Strong field region **(b)** Field free region

(c) Week field region **(d)** None of above

106. One electron volt is:

(a) 1.6×10^{-19}J **(b)** 1.6×10^{-18}J

(c) 1.6×10^{-20}J **(d)** 1.6×10^{-15}J

107. A charge of 0.10 C accelerated through a potential difference of 1000 volt acquires K.E.

(a) 100 J **(b)** 200 J

(c) 100 eV **(d)** 400 J

108. The absolute potential at a point distant 20 cm from a charge of 2 μc is:

(a) 9×10^2 V **(b)** 9×10^3V

(c) 9×10^4 V **(d)** 90 V

109. Capacitor is a device used for:

(a) Storing charge **(b)** Storing direct current

(c) Storing alternating current **(d)** Storing voltage

110. The capacitance of a capacitor is given by the relation:

(a) $C = \frac{Q}{V}$ **(b)** $C = \frac{QV}{2}$

(c) $C = \frac{V}{Q}$ **(d)** $C = \frac{1}{2}QV^2$

111. Farad is the unit of:

(a) Capacitance **(b)** Conductance

(c) Current **(d)** Electric flux

112. The value of capacitance depends upon:

(a) Charge on the plates **(b)** Thickness of the plates

(c) Geometry of the capacitor **(d)** All of above

113. The capacitance of a parallel plate capacitor is given by:

(a) $C = \frac{A}{\in_0 d}$ **(b)** $C = \frac{A\in_0}{d}$

(c) $C = \frac{\in_0 d}{A}$ **(d)** $C = \in_0 Ad$

114. Which one of the following is correct:

(a) $1\mu F = 10^{-6}F$ **(b)** $1PF = 10^{-12}F$

(c) $1\ PF = \mu\mu F$ **(d)** All of above

115. Energy density of a capacitor is equal to:

(a) $\frac{1}{2}\in_0\in_r E^2$ **(b)** $E\in_0\in_r$

(c) $\frac{\in_0\in_r}{E}$ **(d)** None of above

116. A capacitor's capacitance can be increased by:

(a) Increasing the area **(b)** Decreasing the distance

(c) Placing the dielectric **(d)** All of above

117. Faraday is a scientist:

(a) English **(b)** French

(c) American **(d)** Spanish

118. Capacitance and potential difference are:

(a) Directly proportional **(b)** Equal

(c) Constant **(d)** Inversely proportional

119. If we increase the charge, the capacitance:

(a) Decrease **(b)** Constant

(c) Increase **(d)** None of these

120. When dielectric is placed between the plates it decrease the:

(a) Electric intensity **(b)** Electric force

(c) Surface charge density **(d)** Potential difference

121. The charges on the parallel plates of capacitor possess:

(a) K.E **(b)** Chemical energy

(c) Electric potential energy **(d)** None of above

122. When capacitor arises, the potential from $0 \rightarrow V$ its average potential difference is:

(a) $\frac{V}{2}$ **(b)** $-V$

(c) V **(d)** Zero

123. Energy stored in capacitor is:

(a) $\frac{1}{2}CV^2$ **(b)** $\frac{1}{4}CV^2$

(c) $\frac{1}{2}C^2V$ **(d)** $\frac{1}{2}CV^4$

124. The circuit having combined components resistance and capacitor is called:

(a) R-L circuit **(b)** R-C circuit

(c) R-L.C circuit **(d)** R.I circuit

125. The charging time of the capacitor depends open:

(a) $R \times C$ **(b)** $\frac{R}{C}$

(c) $R \times L$ **(d)** $\frac{RL}{C}$

126. When dielectric material is placed in an electric field it:

(a) Conducts **(b)** Exhibit electric charge

(c) Undergoes electrolysis **(d)** Becomes polarized

127. The energy supplied in charging a capacitor resides after the charging in:

(a) The battery **(b)** The electric field

(c) The magnetic field **(d)** None of these

128. A system of two equal and opposite charges separated by a small distance is called:

(a) A dipole **(b)** Inductance

(c) A capacitor **(d)** A condenser

129. An electric field that will balance a weight of an electron should act:

(a) In the downward **(b)** In the upward

(c) Along surface of sphere **(d)** None of these

130. If a charge body moved against the electric field it will gain:

(a) Potential energy **(b)** K.E

(c) Mechanical energy **(d)** Electric potential energy

131. Charge on electron was determined by:

(a) Ampere **(b)** Maxwell

(c) Milikan **(d)** Bohr

132. In the xerographic machine, the heart of the machine drum is made of:

(a) Ceramic **(b)** Semi-conductor

(c) Strong plastic **(d)** Aluminum

133. Electric field intensity at a point is defined the equation:

(a) $E = \frac{q}{F}$ **(b)** $E = \frac{F}{q}$

(c) $E = qF$ **(d)** $E = \frac{q^2}{F}$

134. If a dielectric is placed between the plates of a capacitor, its capacitance will:

(a) Increase **(b)** Decrease

(c) Becomes double **(d)** None of these

135. The number of electrons in one coulomb charge:

(a) Zero **(b)** 1.6×10^{-19}

(c) 6.2×10^{-19} **(d)** 6.2×10^{18}

136. If the distance between two charges is doubled, the force between them:

(a) Four times **(b)** One fourth

(c) Half **(d)** Remain same

137. An electric field cannot deflect:

(a) X-rays **(b)** α-particles

(c) β-particles **(d)** None of these

138. When a dielectric is placed in an electric field, it is:

(a) Change **(b)** Polarized

(c) Remain unchanged **(d)** None of these

139. $\in_o$ is permittivity of free space it can be given as:

(a) $\in_o = \frac{1}{\in_r}$ **(b)** $\in_o = \frac{1}{K}$

(c) $\in_o = \frac{1}{4\pi K}$ **(d)** None of these

140. A force of 0.01 N is exerted on a charge 1.2×10^{-5} C at a certain point. The electric field at that point is:

(a) 1.2×10^4 N/C **(b)** 1.2×10^4 C/N

(c) 8.3×10^2 N/C **(d)** 8.3×10^{-2} N/C

141. A charge -4 μC is at origin and $+16$ μC is at a distance 3 m on positive x-axis. The zero field is located at:

(a) 3 m along y-axis **(b)** 3 m along negative x-axis

(c) 3 m along positive x-axis **(d)** None of these

142. Electric intensity between two same charged parallel plates is:

(a) $\frac{\sigma}{\in_o}$ **(b)** $\frac{2\sigma}{\in_o}$

(c) Zero **(d)** None of these

143. Capacitance of a capacitor is increases by decreasing:

(a) Area of plates **(b)** Medium

(c) Distance between plates **(d)** None of these

144. Two metallic sphere of radius 2 cm and 4 cm get equal quantity of charge. Which has greater surface charge density?

(a) 2^{nd} sphere **(b)** Both have same

(c) First sphere **(d)** None of these

145. The apparatus used by coulomb is:

(a) Cavendish **(b)** Torsion balance

(c) Physical balance **(d)** Gold leaf electroscope

146. The number of lines per unit area passing perpendicular through an area is called:

(a) Flux **(b)** Electric intensity

(c) Both (a), (b) **(d)** None of these

ANSWERS									
1.	(a)	**2.**	(b)	**3.**	(a)	**4.**	(c)	**5.**	(a)
6.	(a)	**7.**	(b)	**8.**	(c)	**9.**	(c)	**10.**	(b)
11.	(a)	**12.**	(a)	**13.**	(c)	**14.**	(c)	**15.**	(c)
16.	(c)	**17.**	(b)	**18.**	(a)	**19.**	(a)	**20.**	(a)
21.	(b)	**22.**	(a)	**23.**	(c)	**24.**	(a)	**25.**	(a)
26.	(c)	**27.**	(a)	**28.**	(d)	**29.**	(b)	**30.**	(a)
31.	(a)	**32.**	(c)	**33.**	(a)	**34.**	(b)	**35.**	(a)
36.	(c)	**37.**	(d)	**38.**	(a)	**39.**	(b)	**40.**	(a)
41.	(a)	**42.**	(d)	**43.**	(b)	**44.**	(a)	**45.**	(d)
46.	(b)	**47.**	(b)	**48.**	(b)	**49.**	(c)	**50.**	(c)
51.	(a)	**52.**	(a)	**53.**	(b)	**54.**	(c)	**55.**	(a)
56.	(a)	**57.**	(a)	**58.**	(b)	**59.**	(c)	**60.**	(a)
61.	(a)	**62.**	(d)	**63.**	(c)	**64.**	(a)	**65.**	(a)
66.	(b)	**67.**	(a)	**68.**	(a)	**69.**	(c)	**70.**	(a)
71.	(a)	**72.**	(a)	**73.**	(a)	**74.**	(b)	**75.**	(c)
76.	(a)	**77.**	(c)	**78.**	(a)	**79.**	(c)	**80.**	(b)
81.	(a)	**82.**	(c)	**83.**	(d)	**84.**	(b)	**85.**	(d)
86.	(d)	**87.**	(a)	**88.**	(d)	**89.**	(c)	**90.**	(a)
91.	(b)	**92.**	(d)	**93.**	(b)	**94.**	(c)	**95.**	(b)
96.	(d)	**97.**	(a)	**98.**	(d)	**99.**	(c)	**100.**	(a)
101.	(a)	**102.**	(c)	**103.**	(a)	**104.**	(c)	**105.**	(b)
106.	(a)	**107.**	(a)	**108.**	(c)	**109.**	(a)	**110.**	(a)
111.	(a)	**112.**	(d)	**113.**	(b)	**114.**	(d)	**115.**	(a)
116.	(d)	**117.**	(b)	**118.**	(d)	**119.**	(c)	**120.**	(a)
121.	(c)	**122.**	(a)	**123.**	(a)	**124.**	(b)	**125.**	(a)
126.	(d)	**127.**	(b)	**128.**	(a)	**129.**	(a)	**130.**	(b)
131.	(c)	**132.**	(d)	**133.**	(b)	**134.**	(a)	**135.**	(d)
136.	(b)	**137.**	(a)	**138.**	(b)	**139.**	(c)	**140.**	(c)
141.	(b)	**142.**	(c)	**143.**	(c)	**144.**	(c)	**145.**	(b)
146.	(b)								

CURRENT ELECTRICITY

Each question has four possible answers, tick (✓) the correct answer:

1. In liquids and gases, the current is due to the motion of:

(a) Negative charges **(b)** Neutral particle

(c) Positive charges **(d)** Both negative and positive charges

2. The charge carriers in metallic conductors are:

(a) Free electrons and ions **(b)** Electrons

(c) Electrons and protons **(d)** +ve and –ve ions

3. The conventional current is due to the flow of:

(a) Atoms and molecules **(b)** Positive charge

(c) Negative charge **(d)** Both (b) and (c)

4. The electronics current is due to the flow of:

(a) Positive charge **(b)** Negative ions

(c) Positive ions **(d)** Negative charge

5. An electric current in a wire involves the movement of:

(a) Electrons **(b)** Atoms

(c) Protons **(d)** Molecules

6. When electric current passes through the conductors, it increases:

(a) P.E of the atoms **(b)** K.E of the atoms

(c) Atomic size **(d)** Number of protons

7. When a pot difference of 4 volt is applied across resistance, 10 J of energy is converted. Find charge flows:

(a) 0.20 C **(b)** 2.5 C

(c) 5.0 C **(d)** 10.0 C

8. The motion of free electrons inside the metallic conductors is:

(a) Circular motion **(b)** Linear motion

(c) Random motion **(d)** None of above

9. The net charge flowing across the cross-sectional area per unit time is known as:

(a) Electric flows **(b)** Electric current

(c) Pot difference **(d)** Ampere

10. Electric heater is the effect of electric current:

(a) Heating effect **(b)** Chemical effect

(c) Magnetic effect **(d)** None of above

11. Thermo-couple convert ———— into electrical energy:

(a) Heat energy **(b)** Nuclear energy

(c) Mechanical energy **(d)** Chemical energy

12. If a charge Q flows through any cross section of the conductor in time t, the current I is:

(a) $I = Qt$ **(b)** $I = \frac{Q}{t}$

(c) $I = \frac{t}{Q}$ **(d)** $I = \frac{Q^2}{t}$

13. SI unit of electric current is:

(a) Ampere **(b)** Coulomb

(c) Volt **(d)** Ohm

14. At constant temp, the current flowing through a conductor is directly proportional to the potential difference across its ends is called:

(a) Charles law **(b)** Amperes law

(c) Coulombs law **(d)** Ohm's law

15. Most practical applications of electricity:

(a) Molecules in motion **(b)** Electrons at rest

(c) Charge in motion **(d)** Atoms in notion

16. The conventional current is the name given to current due to flow of:

(a) Positive charges **(b)** Negative charges

(c) Both (a) and (b) **(d)** None of these

17. A current of 1 ampere is passing through a conductor, the charge passing through it in one minute is:

(a) 40 coulomb **(b)** 60 coulomb

(c) 2 coulomb **(d)** None of these

18. The magnitude of the drift velocity is of the order of:

(a) 10^{-3} m/s **(b)** 10^{-4} m/s

(c) 10^{-6} m/s **(d)** 10^{3} m/s

19. Drift velocity is used when the ends of a wire are:

(a) Connected to a voltage source **(b)** Not connected to voltage source

(c) At different values of potential **(d)** Both (a) and (c)

20. The production of heat due to an electric current flowing through a conductor is given by:

(a) Feed back effect **(b)** Joule's effect

(c) Compton effect **(d)** Photo electric effect

21. When same current passes for same time through a thick and thin wire:

(a) No heat is produced in wire **(b)** More heat is produced in thin wire

(c) More heat is produced in thick wire **(d)** None of these

22. The average velocity gained by electrons in a conductor placed in electric field is called:

(a) Variable velocity **(b)** Uniform velocity

(c) Drift velocity **(d)** Instantaneous velocity

23. A wire having very high value of conductance is said to be:

(a) Very good conductor **(b)** An insulator

(c) Moderately good conductor **(d)** None of liens

24. The effects of bends in a wire on its electrical resistance are:

(a) Zero **(b)** Larger

(c) Smaller **(d)** None of these

25. An electric field is generated along the wire when:

(a) A constant potential is maintained across the wire

(b) Net current is zero

(c) A constant potential difference is maintained across the wire

(d) None of these

26. In order to have a constant current through a wire, the potential difference across its ends should be:

(a) Increasing **(b)** Decreasing

(c) Zero **(d)** Maintained constant

27. When two spherical conducting balls at different potentials are joined by metallic wire, after some time, potential difference will be:

(a) Same **(b)** Zero

(c) Different **(d)** None of these

28. Conversion of chemical energy into electrical energy can be achieved by:

(a) Solar cell **(b)** Photo voltaic cell

(c) Dry cell **(d)** None of these

29. The device, which converts heat energy into electrical energy is called:

(a) Thermo couple **(b)** Photo voltaic cell

(c) Thermistor **(d)** Thermostat

30. Heating effect of current is used in:

(a) Electric Kittle **(b)** Electric motor

(c) Electric taster **(d)** Both (a) and (c)

31. Magnetic effect of current is used:

(a) To detect a current **(b)** To measure a current

(c) In electric motor **(d)** All of above

32. Electrolysis is the study of conduction of electricity through:

(a) Liquids **(b)** Solids

(c) Greases **(d)** All

33. The vessel containing the two electrodes and certain liquid is known:

(a) Electrolyte **(b)** Thermometer

(c) Voltameter **(d)** None of these

34. The voltameter usually contains:

(a) Dilute solution of $CuSo_4$ **(b)** Water

(c) Carbon **(d)** $CuSO_4$ in solid form

35. During electrolysis process, density of $CuSO_4$ solution:

(a) Remains constant **(b)** Decreased

(c) Increased **(d)** None of these

36. The magnitude of magnetic effects depends upon:

(a) Quality of electricity passed through the liquid

(b) Colour of the liquid

(c) Nature of the liquid

(d) Both (a) and (c)

37. Mathematically ohm's law can be expressed as:

(a) $V = \frac{I}{R}$ **(b)** $V = IR$

(c) $R = VI$ **(d)** None of above

38. The conductors which obey Ohm's law are called:

(a) Super conductors **(b)** Semi-conductors

(c) Ohmic **(d)** Non-ohmic

39. The conductors which do not obey Ohm's law are called:

(a) Non-Ohmic **(b)** Ohmic

(c) Super conductors **(d)** Semi-conductors

40. For ohmic devices, the graph between V and I is:

(a) A curve **(b)** A straight line

(c) Parabola **(d)** None of above

41. For non-ohmic devices, the graph between V and I is:

(a) Not a straight line **(b)** A straight line

(c) A curve **(d)** All of above

42. The opposition offered by the conductor to the flow of current is called:

(a) Conductance **(b)** Inductance

(c) Resistance **(d)** None of above

43. The resistance on a one metre cube of a conductor is called:

(a) Resistivity **(b)** Inductivity

(c) Permitivity **(d)** Conductivity

44. The SI unit of resistance is:

(a) Ohm **(b)** Ampere

(c) Volt **(d)** Joule

45. The SI unit of resistivity is:

(a) Ohm-m **(b)** Ohm-m^2

(c) Ohm-m^3 **(d)** Ohm

46. The reciprocal of a resistance is called:

(a) Conductance **(b)** Inductance

(c) Reactance **(d)** Resistivity

47. The reciprocal of resistivity is:

(a) Conductivity **(b)** Permitivity

(c) Resistance **(d)** Voltage

48. The SI unit of conductance is:

(a) mho **(b)** Ohm

(c) mho-m^{-1} **(d)** None of above

49. If the resistivity of the conductor is large then it is:

(a) An insulator **(b)** A poor conductor

(c) A good conductor **(d)** A conductor

50. If the resistivity of the conductor is small then it is:

(a) Good conductor **(b)** Conductor

(c) Insulator **(d)** Poor conductor

51. The study of conductance of Electricity through liquids is known as:

(a) Electrolysis **(b)** Resistivity

(c) Conductivity **(d)** None of above

52. Conductance is:

(a) Reciprocal of resistance **(b)** Measured in mho

(c) Another name of resistance **(d)** All of above

53. The value of the resistivity is the least for:

(a) Silver **(b)** Aluminium

(c) Copper **(d)** All of above

54. Which of the following substance has got positive temperature coefficient of resistance:

(a) Copper **(b)** Aluminium

(c) Silver **(d)** All of above

55. Colour code carbon resistance consist of:

(a) Four bands read from left to right **(b)** Three bands read from left to right

(c) Four bands read from right to left **(d)** None of these

56. The third band of the colour code:

(a) Gives the third digit **(b)** Gives the number of zeros

(c) Give the tolerance **(d)** None of these

57. The fourth band is a:

(a) Gold band **(b)** Silver band

(c) Brown band **(d)** Both (a) and (b)

58. Gold band shows a tolerance of:

(a) ± 10% **(b)** ± 20%

(c) ± 5% **(d)** 10%

59. Silver band shows a tolerance of:

(a) ± 10% **(b)** ± 20%

(c) ± 5% **(d)** 10%

60. If there is no fourth band, tolerance is shows as:

(a) ± 10% **(b)** ± 20%

(c) ± 5% **(d)** 10%

61. The wire used in the construction of a rheostat is of the material:

(a) Iron **(b)** Silver

(c) Gold **(d)** Manganin

62. To use a rheostat as variable resistor, the terminals which are inserted in a circuit are:

(a) Fixed terminal A and sliding contact C **(b)** Both fixed terminals A and B

(c) Fixed terminal B and sliding contact C **(d)** All of above

63. Thermistors are made from mixtures of metallic oxides of:

(a) Gold **(b)** Silver

(c) Manganese **(d)** Carbon

64. Thermistors are prepared under:

(a) High pressure and high temperature **(b)** High pressure and low temperature

(c) Low pressure and low temperature **(d)** None of these

65. Thermistors may be in the form of:

(a) Rods **(b)** Washers

(c) Beads **(d)** Either of these

66. A temperature changes converts changes of temperature into:

(a) Electrical voltage **(b)** Light signals

(c) Sound signals **(d)** All of above

67. In the construction of a rheostat, we use manganin which is an alloy of:

(a) Cu, Ag and Fe **(b)** Fe and Ni

(c) Cu, Au and Fe **(d)** Cu, Ni, Fe and Mn

68. Work done in moving a charge ΔQ up through the potential difference V is given be:

(a) $W = \frac{\Delta Q}{V}$ **(b)** $W = \frac{V}{\Delta Q}$

(c) $W = V\Delta Q$ **(d)** $W = \frac{1}{V\,\Delta Q}$

69. When the current is being drawn from the battery:

(a) V = E + Ir is applied **(b)** V = E – Ir is applied

(c) It is being discharged **(d)** Both (a) and (c)

70. When the current is drawn from a cell, its terminal potential difference and emf are:

(a) Different **(b)** Same

(c) Both zero **(d)** None of them

71. The resistance present between the two electrodes of the cell is due to:

(a) Connecting wires **(b)** An electrolyte present between them

(c) Electrodes themselves **(d)** None of these

72. When a battery is being charged, its terminal potential difference is:

(a) Less than its emf **(b)** Greater than its emf

(c) Equal to emf **(d)** None of these

73. The loss of electrical energy per second is called:

(a) Power dissipation **(b)** Energy dissipation

(c) Work **(d)** None of these

74. The unit of emf is:

(a) Newton **(b)** Joule

(c) Ampere **(d)** J/c

75. The quantity having the same unit as that of emf is:

(a) Energy **(b)** Momentum

(c) Potential difference **(d)** Current

76. Kirchhoff's first rule is a manifestation of law of enervation of:

(a) Charge **(b)** Mass

(c) Energy **(d)** None of these

77. Kirchhoff's second rule is a manifestation of law of conservation of:

(a) Charge **(b)** Mass

(c) Energy **(d)** None of these

78. A voltmeter can read the correct potential difference only when the current drawn by it from the cell is:

(a) Smaller **(b)** Greater

(c) Zero **(d)** None of these

79. The unknown emf Ex, can be found by using potentiometer by formula:

(a) $Ex = \frac{R}{r} \times E$ **(b)** $Ex = E\frac{r}{R}$

(c) $Ex = \frac{l}{L} \times E$ **(d)** Both (b) and (c)

80. The electrode connected with positive terminal of battery is called:

(a) Anode **(b)** Cathode

(c) Electrode **(d)** Electrolyte

81. The electrode connected with negative terminal of battery is called:

(a) Electrode **(b)** Cathode

(c) Anode **(d)** Electrolyte

82. The resistance of a conductor through which a current of one ampere is flowing when a potential difference across its ends is one volt is:

(a) One volt **(b)** One ohm

(c) One ampere **(d)** One coulomb

83. The resistance of a conductor depends upon:

(a) Pot difference between its ends

(b) The nature of material

(c) Dimension

(d) The nature, dimension and physical state of conductor

84. If the resistance of the conductor is increased, the current will:

(a) Remains the same **(b)** Increase

(c) Decrease **(d)** None of above

85. The resistance of a conductor of length L, cross-sectional area A and resistivity ρ is given by:

(a) $R = \frac{L}{\rho A}$ **(b)** $R = \frac{\rho L}{A}$

(c) $R = \frac{A}{\rho L}$ **(d)** $R = \frac{\rho}{LA}$

86. The resistivity of the material having the resistance R, cross-sectional area A and length L is:

(a) $\rho = \frac{AL}{R}$ **(b)** $\rho = \frac{A}{LR}$

(c) $\rho = \frac{RA}{L}$ **(d)** $\rho = \frac{RL}{A}$

87. The resistance of the conductor does not depend upon its:

(a) Mass **(b)** Length

(c) Cross-sectional area **(d)** Resistivity

88. When the temperature of a conductor is raised, its resistance:

(a) Remains the same **(b)** Always increase

(c) Always decrease **(d)** None of these

89. The resistance of the conductor increase with the increase in its:

(a) Cross-sectional area **(b)** Length

(c) Diameter **(d)** None of these

90. The resistance of the conductor increases due to rise of temp of a conductor because collision cross-section of the atoms:

(a) Remain, unchanged **(b)** Decreases

(c) Increases **(d)** None of above

91. Non-ohmic devices are:

(a) Filament of a bulb **(b)** Semiconductor diode

(c) Both (a) and (b) **(d)** None of above

92. In series circuit, the pot difference across each resistance is:

(a) Different **(b)** Same

(c) Variable **(d)** None of these

93. In parallel circuit, the current has:

(a) Many paths **(b)** Two paths

(c) Three paths **(d)** None of these

94. The equivalent resistance in series circuit is:

(a) $R_e = R_1 + R_2 + R_3$ **(b)** $R_e = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

(c) $\frac{1}{R_e} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ **(d)** All of above

95. The equivalent resistance in parallel circuit is:

(a) $R_e = R_1 + R_2 + R_3$ **(b)** $R_e = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

(c) $\frac{1}{R_e} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ **(d)** All of above

96. The Fractional change in resistivity per unit original resistivity per Kelvin in temperature is known as:

(a) Temperature coefficient of resistance **(b)** Temperature coefficient of resistivity

(c) Temperature coefficient of conductivity **(d)** None of these

97. The SI unit of the temp coefficient of resistivity of a material is:

(a) K **(b)** K^{-1}

(c) Ohm K **(d)** Ohm

98. New prepared ceramic material have been found to be super conductor even at:

(a) T = 125 K **(b)** T = 50 K

(c) T = 130 K **(d)** T = 75 K

99. Three resistors of resistance 2, 3 and 6 Ohms are connected in parallel then their equivalent resistance is:

(a) 11.0 ohms **(b)** 1.0 ohm

(c) 5.0 ohms **(d)** 70 ohms

100. Which one is the best conductor:

(a) Copper **(b)** Gold

(c) Silver **(d)** Aluminum

101. The resistivity of ———— decrease with the increase in temp.

(a) Gold **(b)** Silver

(c) Copper **(d)** Silicon

102. Super conductor has ———— temperature coefficient.

(a) +ve **(b)** –ve

(c) Neutral **(d)** None of above

103. The tolerance of silver is:

(a) ± 20% **(b)** ± 15%

(c) ± 5% **(d)** ± 10%

104. The tolerance of gold is:

(a) 20% **(b)** 15%

(c) ± 5% **(d)** 10%

105. Resistance and resistivity of a substance:

(a) Decrease in rise of temperature **(b)** Increase with rise of temperature

(c) Remains same at every temperature **(d)** None of above

106. A heat sensitive resistor is called:

(a) Thermistor **(b)** Variable resistor

(c) Fixed resistor **(d)** None of these

107. A device which is a wire wound resistance called:

(a) Rheostat **(b)** Solenoid

(c) Inductor **(d)** None of above

108. A rheostat can be used as variable resistor as well as a ————.

(a) Potential divider **(b)** Current divider

(c) Wheat stone bridge **(d)** Power divider

109. The electrical power in mathematical form can be expressed as:

(a) $P = I^2 R$ **(b)** $P = I \times V$

(c) $P = \frac{V^2}{R}$ **(d)** All of above

110. If one end of the fixed terminals and sliding contact of a rheostat are connected in a circuit, it is to be used as:

(a) Variable resistor **(b)** Power supply

(c) Potential divider **(d)** None of above

111. Algebraic sum of currents meeting at a point is zero according to:

(a) Faraday's law **(b)** Ampere's law

(c) Kirchhoff first rule **(d)** None of above

112. If both fixed as well as the sliding contact of a rheostat are connected in a circuit, it is to be used as:

(a) Variable resistor **(b)** Power supply

(c) Potential divider **(d)** None of above

113. When ever current is drawn from the battery, its emf and terminal potential difference became:

(a) Equal **(b)** Different

(c) Zero **(d)** Negative

114. A complex system consisting of a many resistances can be solved by:

(a) Faraday's law **(b)** Ohm's law

(c) Kirchhoff rules **(d)** Ampere's law

115. Kirchoff first rule is also called the law of conservation of:

(a) Momentum **(b)** Mass

(c) Energy **(d)** Charge

116. If the source of emf is traversed from negative to positive terminal, the potential change are:

(a) Positive **(b)** Negative

(c) Consult **(d)** Zero

117. If the source of emf traversed from positive to negative terminals, the potential change are:

(a) Negative **(b)** Constant

(c) Zero **(d)** Positive

118. If the resistor is traversed in the direction of current, the potential change are:

(a) Negative **(b)** Zero

(c) Constant **(d)** Positive

119. When the Wheatstone bridge is balanced, the galvanometer shows zero deflection because:

(a) Both the terminals of galvanometer are at the same potential

(b) Both terminals of the galvanometer have maximum potential

(c) The resistance of galvanometer becomes zero

(d) The resistance of galvanometer becomes maximum

120. Wheat stone bridge is an arrangement consisting of:

(a) Four resistances **(b)** Three resistances

(c) Five resistances **(d)** None of above

121. A balanced Wheatstone bridge is used to measure the:

(a) The current **(b)** Pot difference

(c) An unknown resistance **(d)** None of above

122. The condition for the Wheatstone bridge to be balanced is given by:

(a) $\frac{R_1}{R_2} = \frac{R_3}{R_4}$ **(b)** $\frac{R_2}{R_1} = \frac{R_3}{R_4}$

(c) $\frac{R_1}{R_2} = \frac{R_4}{R_3}$ **(d)** None of above

123. Which one of the following instrument can measure the unknown resistance with sufficient accuracy:

(a) Potentiometer **(b)** Slide wire bridge

(c) Galvanometer **(d)** All of above

124. Slide wire bridge is a practical form of the:

(a) Voltmeter **(b)** Galvanometer

(c) Wheatstone bridge **(d)** Ammeter

125. An instrument which can measure potential without drawing any current is called:

(a) Voltmeter **(b)** Potentiometer

(c) Galvanometer **(d)** Ammeter

126. A device which gives continuously varying ———— is called potential divider.

(a) Potential difference **(b)** Capacitance

(c) Charge **(d)** Inductance

127. The instrument used to compare the emf of two cells is called:

(a) A potentiometer **(b)** An ammeter

(c) A galvanometer **(d)** All of above

128. Which device is used to determine internal resistance of a cell:

(a) Potentiometer **(b)** Wheat stone bridge

(c) Voltmeter **(d)** Ammeter

129. The algebraic sum of potential changes for a closed circuit is zero according to:

(a) Kirchhoff's 2^{nd} rule **(b)** Kirchhoff's first rule

(c) Ampere's law **(d)** Joul's law

130. Internal resistance is the resistance offered by:

(a) The conductor **(b)** The circuit

(c) The resistor **(d)** Source of emf

131. The equation for the power dissipation in a resistor is:

(a) $P = I^2R$ **(b)** $P = \frac{V^2}{R}$

(c) $P = IV$ **(d)** All of above

132. The emf E of the source is expressed by:

(a) $E = \frac{\Delta q}{\Delta w}$ **(b)** $E = \frac{\Delta w}{\Delta Q^2}$

(c) $E = \frac{\Delta w}{\Delta q}$ **(d)** $E = \frac{\Delta w}{\Delta t}$

133. Which one of the following quantities in electricity is analogous to mass in mechanics:

(a) Resistance **(b)** Potential

(c) Charge **(d)** Inductance

134. The temp coefficient of resistance is positive for:

(a) Aluminum **(b)** Germanium

(c) Carbon **(d)** None of the above

135. On increasing the length of a wire, the specific resistance of the material of the wire:

(a) Decreases **(b)** Increases

(c) Remains unchanged **(d)** First decrease then increase

136. Which one of the following is the best material for making connecting wire:

(a) Nichrome **(b)** Manganin

(c) Copper **(d)** None of the above

137. When three resistances 2Ω, 4Ω and 6Ω connected in parallel the equivalent resistance is:

(a) $\frac{11}{12}\Omega$ **(b)** $\frac{12}{11}\Omega$

(c) $12\,\Omega$ **(d)** $0\,\Omega$

138. Two resistances R_1 and R_2 are connected in parallel. The equivalent resistance of the combination is equal to:

(a) $\frac{R_1R_2}{R_1+R_2}$ **(b)** $\frac{R_1+R_2}{R_1R_2}$

(c) R_1+R_2 **(d)** R_2-R_2

139. The resistance of a conductor increases with the rise in temp. This is due to:

(a) Increase in mass of electron **(b)** Decrease of electron density

(c) The decrease of relaxation time **(d)** None of above

140. In a closed circuit, the e.m.f and internal resistance of cell are E and r respectively. If the external resistance in the circuit is R then the Ohm's law has the form:

(a) $I=\frac{E}{R}$ **(b)** $I=\frac{E}{Rr}$

(c) $I=\frac{E}{r}$ **(d)** $I=\frac{E}{R+r}$

141. Three resistance R_1, R_2 and R_3 are connected in parallel. The resultant resistance R is:

(a) Greater than sum of three resistances **(b)** Equal to sum of three resistances

(c) Less than the sum of three resistances **(d)** None of the above

142. The specific resistance of the material of the wire depends on:

(a) Area of cross section **(b)** Mass

(c) Length **(d)** None of the above

143. There are three equal resistances. How many different combination, of these resistances are possible:

(a) Six **(b)** Three

(c) One **(d)** Two

144. The difference of potential between the terminals of a cell in an open circuit is called:

(a) e.m.f **(b)** Resistances

(c) Capacitance **(d)** Potential difference

145. In which one of the following substances, the resistance decreases with increase in temp:

(a) Copper **(b)** Silver

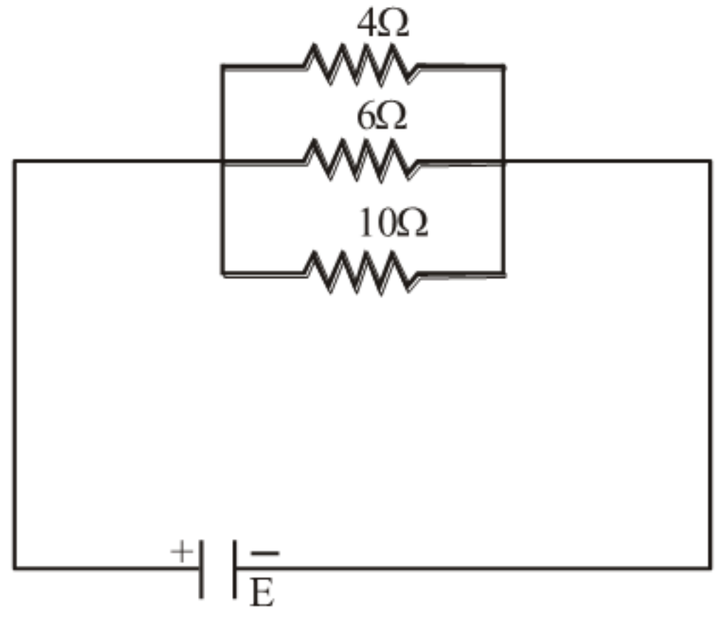
(c) Carbon **(d)** None of these

146. In a wheat stone bridge, the resistances in the ratio arms are 100 Ω and 150 Ω respectively. If R = 80Ω, the resistance of the 4^{th} arm will be:

(a) 80 Ω **(b)** 70 Ω

(c) 150 Ω **(d)** 120 Ω

147. Three resistances of 4Ω, 6Ω and 10 Ω are connected in parallel in a circuit with a battery of e.m.f 4.53 volt. If the current through the 6Ω resistance is 0.6A. The internal resistance of the battery is:



(a) 0.5 Ω **(b)** 0.4 Ω

(c) 0.3 Ω **(d)** 0.2 Ω

148. Which one of the following is the unit of potential gradient:

(a) Volt × Metre **(b)** Volt/Amp

(c) Volt/Metre **(d)** Volt/Amp^2

149. The potential gradient of a wire depends:

(a) Only on current flowing in the wire

(b) Only on resistance per unit length of wire

(c) On the current following in the wire and resistance per unit length of wire

(d) None of the above

150. Which one of the following is the unit of the e.m.f. of a cell:

(a) J/C **(b)** A/Ω

(c) A **(d)** N/C

151. Internal resistance of the cell is the resistance of:

(a) Electrolyte used in cell **(b)** The electrodes of the cell

(c) The vessel of the cell **(d)** None of the above

152. In potentiometer experiment, when the galvanometer shows no deflection, then no current flows in:

(a) Galvanometer circuit **(b)** Potentiometer wire

(c) Battery **(d)** None of the above

153. The potentiometer wire is made of:

(a) Copper **(b)** Manganin

(c) Aluminum **(d)** Steel

154. In potentiometer, the length of its wire is doubled, the accuracy in determining the null point will:

(a) Decrease **(b)** Increase

(c) Remains unchanged **(d)** None of the above

155. Current through a potentiometer wire decrease then null point will be obtained for:

(a) The lower length of wire than before **(b)** The higher length of wire than before

(c) The same length of wire **(d)** None of the above

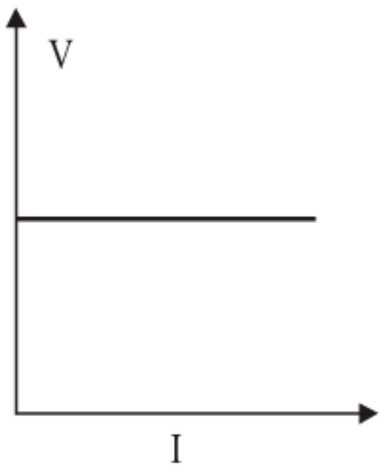
156. The best instrument for the accurate measurement of e.m.f of a cell is:

(a) A potentiometer **(b)** A voltmeter

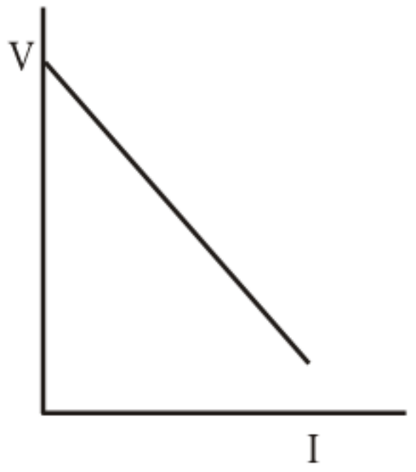
(c) An ammeter **(d)** Slide wire bridge

157. The potential difference across the terminals of a cell varies with the current drawn from the cell in accordance with the graph as shown:

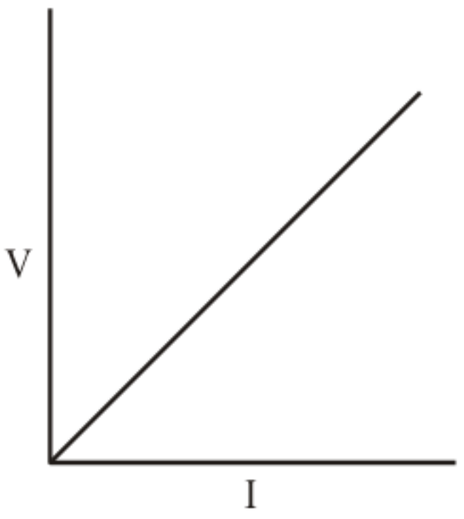
(a)



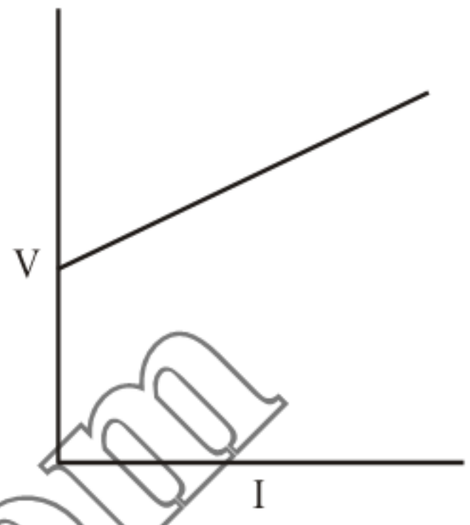
(b)



(c)



(d)



158. Drift velocity of electron, in metal, is of the order of:

(a) 10^{-3} cm/s **(b)** 10^{-3} m/s

(c) 10^{3} m/s **(d)** 10^{-3} mm/s

159. Secondary cells are:

(a) Non-chargeable **(b)** Rechargeable

(c) Both (a), (b) **(d)** Like primary cells

160. If three resistors are connected parallel to each other then their equivalent resistance is:

(a) Greater than larger individual resistance **(b)** Less than smaller individual resistance

(c) Equal to larger value **(d)** Equal to smaller value

161. A potentiometer can be used to:

(a) Find emf **(b)** Compare emf of two cells

(c) Find internal resistance of cell **(d)** All of these

162. A wire of resistance R is cut into two equal parts, its resistance becomes R/2, what happens to resistivity:

(a) Double **(b)** Same

(c) Half **(d)** One fourth

163. The resistance of a conductor does not depend on its:

(a) Length **(b)** Area of cross-section

(c) Resistivity **(d)** Mass

164. The conductance of a conductor increases when:

(a) Its temperature increase **(b)** It temperature decrease

(c) Its length increases **(d)** None of these

165. Unit (S.I) of temperature coefficient of resistivity of a material is:

(a) K **(b)** K^{-1}

(c) °C **(d)** K^{-2}

166. Heat generated by a 40 watt bulb in one hour is:

(a) 4800 J **(b)** 40 J

(c) 144000 J **(d)** 14400 J

167. A 100 watt bulb is operated by 200 volt, the current flowing through bulb is:

(a) 1 A **(b)** 0.5 A

(c) 2.5 A **(d)** 3.5 A

168. The resistance of a 60 watt bulb in a 120 volt line is:

(a) 20 ohm **(b)** 0.5 ohm

(c) 240 ohm **(d)** 2 ohm

169. If a 40 watt bulb is on for 2 hours, how much heat is generated?

(a) 280×10^5 J **(b)** 288×10^3 J

(c) 80 J **(d)** 400 J

170. Maximum power is delivered to a load when:

(a) Internal resistance = External resistance **(b)** Internal resistance > External resistance

(c) Internal resistance < External resistance **(d)** None of these

171. Kirchhoff's 2^{nd} rule obey law of conservation of:

(a) Momentum **(b)** Charge

(c) Energy **(d)** None of these

172. The instrument which measures potential difference accurately:

(a) Potentiometer **(b)** Digital voltmeter

(c) Cathode ray oscilloscope **(d)** All of above

173. Terminal potential difference is greater than emf of the cell when:

(a) Circuit is open **(b)** Circuit is closed

(c) Small battery is charged by bigger battery **(d)** None of these

174. e.m.f. is the conversion of ———— energy into electrical energy.

(a) Chemical **(b)** Solar

(c) Light **(d)** None of these

175. A resistance R is placed in parallel with another resistance of 40 Ω, their equivalent resistance is 24 Ω the value of R is:

(a) 20 Ω **(b)** 40 Ω

(c) 60 Ω **(d)** 80 Ω

176. The product of resistance and conductance is:

(a) 1 **(b)** Resistivity

(c) Conductance **(d)** Zero

ANSWERS

1.	(d)	**2.**	(a)	**3.**	(b)	**4.**	(b)	**5.**	(a)
6.	(b)	**7.**	(b)	**8.**	(b)	**9.**	(b)	**10.**	(a)
11.	(a)	**12.**	(b)	**13.**	(a)	**14.**	(d)	**15.**	(c)
16.	(a)	**17.**	(b)	**18.**	(a)	**19.**	(d)	**20.**	(b)
21.	(c)	**22.**	(c)	**23.**	(a)	**24.**	(a)	**25.**	(c)
26.	(d)	**27.**	(a)	**28.**	(c)	**29.**	(a)	**30.**	(d)
31.	(d)	**32.**	(a)	**33.**	(c)	**34.**	(a)	**35.**	(a)
36.	(d)	**37.**	(b)	**38.**	(c)	**39.**	(a)	**40.**	(b)
41.	(a)	**42.**	(c)	**43.**	(a)	**44.**	(a)	**45.**	(a)
46.	(a)	**47.**	(a)	**48.**	(a)	**49.**	(b)	**50.**	(b)
51.	(a)	**52.**	(a)	**53.**	(b)	**54.**	(b)	**55.**	(a)
56.	(b)	**57.**	(d)	**58.**	(c)	**59.**	(a)	**60.**	(b)
61.	(d)	**62.**	(a)	**63.**	(c)	**64.**	(a)	**65.**	(d)
66.	(a)	**67.**	(d)	**68.**	(c)	**69.**	(d)	**70.**	(a)
71.	(b)	**72.**	(b)	**73.**	(a)	**74.**	(c)	**75.**	(c)
76.	(a)	**77.**	(c)	**78.**	(c)	**79.**	(c)	**80.**	(a)
81.	(b)	**82.**	(b)	**83.**	(d)	**84.**	(c)	**85.**	(b)
86.	(c)	**87.**	(a)	**88.**	(b)	**89.**	(b)	**90.**	(c)
91.	(c)	**92.**	(a)	**93.**	(a)	**94.**	(a)	**95.**	(c)
96.	(b)	**97.**	(b)	**98.**	(a)	**99.**	(b)	**100.**	(c)
101.	(d)	**102.**	(b)	**103.**	(d)	**104.**	(c)	**105.**	(b)
106.	(a)	**107.**	(a)	**108.**	(a)	**109.**	(d)	**110.**	(a)
111.	(c)	**112.**	(c)	**113.**	(a)	**114.**	(c)	**115.**	(d)
116.	(a)	**117.**	(a)	**118.**	(a)	**119.**	(a)	**120.**	(a)
121.	(c)	**122.**	(a)	**123.**	(b)	**124.**	(c)	**125.**	(b)
126.	(a)	**127.**	(a)	**128.**	(a)	**129.**	(a)	**130.**	(d)
131.	(d)	**132.**	(c)	**133.**	(c)	**134.**	(a)	**135.**	(b)
136.	(c)	**137.**	(b)	**138.**	(a)	**139.**	(c)	**140.**	(d)
141.	(c)	**142.**	(c)	**143.**	(d)	**144.**	(a)	**145.**	(c)
146.	(d)	**147.**	(a)	**148.**	(c)	**149.**	(a)	**150.**	(a)
151.	(a)	**152.**	(a)	**153.**	(b)	**154.**	(b)	**155.**	(b)
156.	(a)	**157.**	(c)	**158.**	(b)	**159.**	(b)	**160.**	(b)
161.	(d)	**162.**	(b)	**163.**	(d)	**164.**	(b)	**165.**	(b)
166.	(c)	**167.**	(b)	**168.**	(c)	**169.**	(b)	**170.**	(a)
171.	(c)	**172.**	(d)	**173.**	(c)	**174.**	(a)	**175.**	(c)
176.	(a)								

Chapter 14

ELECTROMAGNETISM

Each question has four possible answers, tick (✓) the correct answer:

1. The name of the scientist who noted that a compass needle was deflected when placed near the current carrying conductor:

(a) Henry **(b)** Faraday

(c) Coloumb **(d)** Oersted

2. The sources of magnetic field are:

(a) Charges in the motion **(b)** Charges at rest

(c) Both (a) and (b) **(d)** None of above

3. A current carrying conductor placed in a magnetic field parallel to it. The force experienced by the conductor is:

(a) F = O **(b)** F = BIL

(c) F = BIL sin θ **(d)** F = BIL cos θ

4. Who discovered a relation between magnetic and electric field:

(a) Lenz **(b)** Faraday

(c) Orested **(d)** None of above

5. A changing magnetic field produces:

(a) Electric current **(b)** Electric field

(c) Magnetic field **(d)** None of above

6. The direction of magnetic lines of force are depend upon:

(a) Direction of current **(b)** Quantity of current

(c) Both (a) and (b) **(d)** None of the above

7. The force acting on one metre length of the conductor placed at right angle to the magnetic field is called:

(a) Magnetic field **(b)** Magnetic induction

(c) Force **(d)** None of the above

8. The dot product of magnetic field B and vector area A is:

(a) Magnetic flux **(b)** Magnetic induction

(c) Faraday's law **(d)** Electric flux

9. Mathematically the magnetic flux is:

(a) $\phi = BA \sin\theta$ **(b)** $\phi = B^2 A$

(c) $\phi = \vec{B} . \vec{A}$ **(d)** $\phi = B.A^2$

10. Tesla is the unit for measuring:

(a) Magnetic intensity **(b)** Magnetic induction

(c) Magnetic force **(d)** None of the above

11. Weber is the unit of:

(a) Magnetic flux **(b)** Permeability

(c) Magnetic force **(d)** None of above

12. Weber has the dimensions of:

(a) volt/sec **(b)** $volt^2/sec$

(c) $volt/sec^2$ **(d)** sec/volt

13. The dimensions of magnetic flux are:

(a) $M^1L^{-2}T^1A^1$ **(b)** $MLT^{-2}A^{-1}$

(c) $ML^2T^2A^{-1}$ **(d)** $ML^2T^{-2}A^{-1}$

14. μ_o is the permeability of free space, its value is:

(a) $4\pi \times 10^{-7}$ Wb Am **(b)** $4\pi \times 10^{-7}$ Wb^{-1} m^{-1}

(c) $4\pi \times 10^{-5}$ Wb $A^{-1}m^{-1}$ **(d)** $4\pi \times 10^{-7}$ Wb $A^{-1}m^{-1}$

15. When the angle between the vector area and the magnetic field is 0° then magnetic flux is:

(a) Half **(b)** Minimum

(c) Maximum **(d)** Double

16. When some compass needles are placed on a cardboard along a circle with the center at the wire, they will:

(a) Set themselves tangential to the circle **(b)** Points in the direction of N-S

(c) Points in the direction of E.W **(d)** None of these

17. In the region surrounding a current carrying wire:

(a) A magnetic field is setup **(b)** The lines of force are elliptical

(c) Both (a) and (b) **(d)** None of these

18. Magnetic force acting on unit positive charge moving perpendicular to the magnetic field with a unit velocity is known as:

(a) Magnetic induction **(b)** Magnetic flux

(c) Magnetic field density **(d)** None of these

19. A current carrying conductor is placed in a uniform magnetic field parallel to it. The magnetic force experienced by the conductor:

(a) $F = \frac{I}{LB \sin\theta}$ **(b)** $F = 0$

(c) $F = IBL \sin\theta$ **(d)** $F = \frac{IBL}{\sin\theta}$

20. The direction of force on a current carrying conductor placed in a magnetic field is that of:

(a) $\vec{L} \times \vec{B}$ **(b)** $\vec{F} \cdot \vec{B}$

(c) Magnetic field **(d)** Length of conductor

21. Magnetic field is a:

(a) Scalar quantity **(b)** Vector quality

(c) Both (a) and (b) **(d)** None of these

22. The direction of magnetic lines of force around a current carrying conductor is given by:

(a) Coulombs law **(b)** Ampere's law

(c) Faraday's law **(d)** Right hand rule

23. The strength of magnetic field around a conductor is:

(a) Directly proportional to the square of distance from the conductor

(b) Same every where around the conductor

(c) Both (a) and (b)

(d) None of these

24. A magnetic compass will be defected if it is kept near a:

(a) Charge at rest **(b)** Charge in motion

(c) No change **(d)** Both (a) and (b)

25. A current is passed through a straight conductor, the magnetic field produced around it. The magnetic lines of force are:

(a) Straight **(b)** Circular

(c) Parabolic **(d)** None of these

26. If a current carrying conductor is placed perpendicular to the magnetic field, it will experience a force:

(a) $F = 0$ **(b)** $F = BIL \sin\theta$

(c) $F = BIL$ **(d)** None of these

27. A magnetic field:

(a) Exerts a force if a charge particle is moving perpendicular to the magnetic field

(b) Exerts a force if a charge particle is moving parallel to the magnetic field

(c) Never exerts a force on charged particle

(d) None of these

28. Which one of the following material is most suitable for making core of electrometer:

(a) Steel **(b)** Cu – Ni alloy

(c) Air **(d)** Soft iron

29. The magnetic force experienced by a charge particle moving in a magnetic field will be minimum when it moves:

(a) Parallel to magnetic field **(b)** Anti-parallel to magnetic field

(c) Perpendicular to magnetic field **(d)** None of these

30. The magnetic force experienced by a charge particle moving in a magnetic field will be maximum when it moves:

(a) Parallel to magnetic field **(b)** Anti-parallel to magnetic field

(c) Perpendicular to magnetic field **(d)** None of these

31. Vector area is vector whose direction is:

(a) Perpendicular to the surface element **(b)** Parallel to the surface element

(c) At an angle of 45° to the surface element **(d)** None of these

32. If the magnetic field is directed along the normal to the area, then magnetic flux is:

(a) Zero **(b)** Maximum

(c) Minimum **(d)** None of them

33. The unit of magnetic induction $\vec{B}$ is:

(a) Coulomb **(b)** Ampere

(c) Coulomb/ampere **(d)** Weber/m^2

34. Magnetic induction is defined as flux per unit area of the surface, which is:

(a) Perpendicular to $\vec{B}$ **(b)** Parallel to $\vec{B}$

(c) Both (a) and (b) **(d)** None of these

35. Magnetic flux density at any point due to a current carrying conductor can be computed from:

(a) Newton's law **(b)** Coulomb's law

(c) Ampere's law **(d)** Lenz's law

36. Amperean path is:

(a) Circular path **(b)** Closed path

(c) Rectangular path **(d)** Any of above

37. μ_o is called:

(a) Permeability of free space **(b)** Proportional constant

(c) Permitivity of free space **(d)** None of these

38. A solenoid is a coil of wire, which is:

(a) Short loosely wound cylindrical coil of wire

(b) Long tightly wound cylindrical coil of wire

(c) Both (a) and (b)

(d) None of these

39. The magnetic field is uniform and stronger:

(a) Outside the solenoid **(b)** Inside the solenoid

(c) At the central part of the solenoid **(d)** None of these

40. In the formula, $B = \mu_o nI$, where n represents:

(a) Number of turns per unit length **(b)** Number of turns per unit volume

(c) Number of turns per unit area **(d)** All of above

41. The magnetic field inside the solenoid can be increased by:

(a) Increasing number of turns **(b)** Decreasing current

(c) Increasing current **(d)** Both (a) and (c)

42. The permeability of free space is measured in:

(a) wb A/m **(b)** Am/wb

(c) wb/Am **(d)** m/wbA

43. The strength of magnetic field is measured in SI units:

(a) Am/N **(b)** Nm/A

(c) N/Am **(d)** N

44. Nm/A is commonly called:

(a) Gauss **(b)** Volt

(c) Ampere **(d)** Weber

45. A long wire wound tightly on a cylindrical coil is called:

(a) Toroid **(b)** Slide wire bridge

(c) Potentiometer **(d)** Solenoid

46. If the length of the solenoid is doubled without changing the number of turns then magnetic field:

(a) is not charged **(b)** becomes half

(c) becomes double **(d)** None of these

47. If there are n charge carriers per unit volume then the number of charge carriers in a segment of wire of length L and area A is:

(a) AL/n **(b)** n A/L

(c) n AL **(d)** n L/A

48. If an electron is projected in a magnetic field with velocity V, it will experience a force:

(a) $\vec{F} = e(\vec{B} \times \vec{V})$ **(b)** $\vec{F} = e(\vec{V} \times \vec{B})$

(c) $\vec{F} = \vec{V}(e \times \vec{B})$ **(d)** $\vec{F} = e(\vec{V} \cdot \vec{B})$

49. When the charge particle is projected at right angles to the magnetic field then force experienced will be:

(a) F = qvB **(b)** Minimum

(c) Zero **(d)** None of these

50. When the charge particle is projected in the direction parallel to the magnetic field, then force experienced will be:

(a) qvB **(b)** Maximum

(c) Zero **(d)** None of these

51. When an electric charge q is placed in an electric field, it will experienced a force:

(a) At an angle 45^o to the field **(b)** Parallel to electric field

(c) Perpendicular to the field **(d)** None of these

52. If a charge is free to move in an electric field then acceleration produced in it will be:

(a) $a = \frac{qE}{m}$ **(b)** a = qEm

(c) $a = \frac{q}{Em}$ **(d)** $A = \frac{m}{qE}$

53. Lorentz force means the force acting on a particle, which is:

(a) Magnetic force only **(b)** Electric force only

(c) Sum of electric and magnetic force **(d)** None of these

54. In formula $\vec{F} = e(\vec{V} \times \vec{B})$ where $\vec{F}$ is:

(a) Parallel to $\vec{V}$ **(b)** Perpendicular to $\vec{V}$ and $\vec{B}$

(c) Parallel to $\vec{B}$ **(d)** Perpendicular to $\vec{B}$

55. When an electron enters at right angle to the magnetic field, the magnitude of velocity:

(a) Remains constant **(b)** Decreases

(c) Increases **(d)** None of these

56. When an electron is projected in a direction perpendicular to the lines of magnetic force, its path may be:

(a) Circular **(b)** Straight line

(c) Parabola **(d)** None of these

57. The e/m of an electron can be calculated if we know the value of:

(a) Magnetic Field **(b)** Velocity of electron

(c) Radius of circular path **(d)** All of above

58. The e/m of an electron can be calculated by using the formula:

(a) $\frac{e}{m} = \frac{Vr}{Br}$ **(b)** $\frac{e}{m} = \frac{2v}{B^2 r^2}$

(c) $\frac{e}{m} = \frac{2Ve}{m}$ **(d)** None of these

59. If the magnetic flux is expressed in weber, then the magnetic induction can be expressed as:

(a) Weber/m **(b)** Weber/m^2

(c) Weber/m^3 **(d)** m/Weber

60. Which one of the following is the unit of magnetic induction:

(a) Gauss **(b)** Dyne

(c) Ampere **(d)** Newton

61. The earth magnetic field always has a vertical component except at the:

(a) Magnetic pole **(b)** Magnetic equator

(c) Both (a) and (b) **(d)** None of the above

62. Magnetic field is a:

(a) Vector quantity **(b)** Scalar quantity

(c) Scalar as well as vector **(d)** None of these

63. The magnetic field at a point due to current carrying conductor is directly proportional to:

(a) Current flows through the conductor **(b)** Distance from the conductor

(c) Resistance of the conductor **(d)** Thickness of the conductor

64. The direction of the magnetic field produced by a linear current is given by:

(a) Joule's law **(b)** Ampere law

(c) Right hand rule **(d)** None of the above

65. Two free parallel wires carrying currents in opposite direction:

(a) Repel each other **(b)** Attract each other

(c) Do not effect each other **(d)** All of above

66. Ampere's law mathematically can be expressed as:

(a) $\sum_{i=1}^{N} \left(\vec{B} \cdot \vec{\Delta L}\right) = \mu_0 I$ **(b)** $\sum_{i=1}^{N} \left(\vec{B} \cdot \vec{\Delta L}\right) = \mu_o A$

(c) $\sum_{i=1}^{N} \left(\vec{B} \cdot \vec{\Delta L}\right) = \mu_0 N$ **(d)** $\sum_{i=1}^{N} \left(\vec{B} \cdot \vec{\Delta L}\right) = \mu_0 R$

67. A current carrying conductor surrounded by:

(a) Electric field **(b)** Magnetic field

(c) Gravitational field **(d)** All of the above

68. A charged particle moving with velocity $\vec{V}$ in a magnetic field $\vec{B}$ experiences a magnetic force is:

(a) $\vec{F} = \frac{(\vec{V} \times \vec{B})}{q}$ **(b)** $\vec{F} = q(\vec{V} \cdot \vec{B})$

(c) $\vec{F} = q(\vec{V} \times \vec{B})$ **(d)** $\vec{F} = \frac{\vec{V} \cdot \vec{B}}{q}$

69. The energy resides in a current carrying conductor in the form of:

(a) Magnetic field **(b)** Electrostatic field

(c) Gravitational field **(d)** All of above

70. If a moving electron deflected side ways on passing through a certain region of space, can we predict the presence of a magnetic field:

(a) No **(b)** Yes

(c) Maximum **(d)** None of above

71. The magnetic force experienced by a charged particle moving in a magnetic field will be maximum when it moves:

(a) Perpendicular to the field **(b)** Parallel to the field

(c) Anti parallel to the field **(d)** All of above

72. A compass needle will be deflected if it is kept near:

(a) Charged body in motion **(b)** A negatively charged body at rest

(c) A positively charged body at rest **(d)** none of the above

73. Ampere based his circuital law on the findings of:

(a) Ampere himself **(b)** Laplace

(c) Biot-sarvant **(d)** Maxwell

74. The total number of magnetic lines of force passing normally through a given area is called:

(a) magnetic flux **(b)** flux density

(c) self induction **(d)** mutual induction

75. Magnetic flux and flux density are related by:

(a) Flux density = Flux × Area **(b)** Flux density = $\frac{\text{Flux}}{\text{Area}}$

(c) Flux = $\frac{\text{Flux density}}{\text{Area}}$ **(d)** None of the above

76. Which one of the following quantities can be replaced by magnetic induction:

(a) Flux density **(b)** Magnetic flux

(c) Magnetic field intensity **(d)** All of above

77. Charge to mass ratio (e/m) of a charged particle is also called:

(a) Specific force **(b)** Specific charge

(c) Both (a) and (b) **(d)** None of the above

78. The SI unit of permeability μ_o is:

(a) Weber –m/A **(b)** Weber/A.m

(c) Weber –A/m **(d)** None of the above

79. A long tightly wound cylindrical coil of wire is called:

(a) Capacitor **(b)** Resistance

(c) Inductor **(d)** Solenoid

80. The magnetic field at the middle of the solenoid is:

(a) Uniform and strong **(b)** Uniform

(c) Strong **(d)** Weak

81. The magnetic field out of the solenoid is:

(a) Negligible weak **(b)** Uniform

(c) Uniform and strong **(d)** All of above

82. Ampere's circuital law is $\sum_{i=1}^{N} \left(\vec{B} \cdot \vec{\Delta L}\right)_i =$

(a) $\mu_o I$ **(b)** $\mu_o A$

(c) $\mu_o B$ **(d)** None of the above

83. Force on the current carrying conductor placed in a uniform magnetic field is:

(a) $I\vec{L} \times \vec{B}$ **(b)** $\vec{Iq} \times \vec{B}$

(c) $\frac{IL}{B}$ **(d)** $\vec{IL} \times \vec{V}$

84. Which one is suitable for circular trajectory of a charged particle:

(a) Magnetic field **(b)** Electric field

(c) Conservative field **(d)** Gravitational field

85. In particle velocity method, the selected speed is equal to:

(a) $V = BE$ **(b)** $V = \frac{E}{B}$

(c) $V = \frac{E}{F}$ **(d)** None of the above

86. One tesla is equal to:

(a) 1 Gauss **(b)** 10^4 Gauss

(c) 10 Gauss **(d)** 10^{-4} Gauss

87. Magnetic flux density at a point due to the current carrying conductor determined by:

(a) Faraday's law **(b)** Ampere's law

(c) Flemming's law **(d)** Gauss's law

88. When a charged particle q is moving with velocity $\vec{V}$ in a region where there is an electric field $\vec{E}$ and magnetic field $\vec{B}$ then the total electric and magnetic force on the particle is:

(a) $F = qE + q\,VB$ **(b)** $F = qBV$

(c) $F = qVB - qE$ **(d)** $F = BIL$

89. The expression for torque acting on a current carrying coil placed in a uniform magnetic field is equal to:

(a) $\tau = BIA \cos \alpha$ **(b)** $\tau = BA \cos \alpha$

(c) $\tau = BIA \sin \alpha$ **(d)** $\tau = IB \cos \alpha$

90. A device used for the measurement and detection of current is called:

(a) Ammeter **(b)** Galvanometer

(c) Voltmeter **(d)** All of the above

91. In case of galvanometer, the magnitude of the deflecting torque is given as:

(a) $BINA \cos \alpha$ **(b)** $BIN \cos \alpha$

(c) $NIA \cos \alpha$ **(d)** none of above

92. The sensitivity of the galvanometer can be increased by increasing the:

(a) Area of the coil **(b)** Strength of magnetic field

(c) Number of turns of the coil **(d)** All of these

93. The sensitivity of a galvanometer depends upon the factors:

(a) $\frac{C}{BAN}$ **(b)** $\frac{BAN}{C}$

(c) $\frac{BC}{AN}$ **(d)** None of these

94. Cathode ray oscilloscope works by deflecting a beam of:

(a) Positrons **(b)** Electrons

(c) Protons **(d)** Both electrons and protons

95. A sensitive galvanometer measures currents:

(a) In milli amperes **(b)** In nano amperes

(c) In amperes **(d)** In divisions of angle of twist

96. A moving coil galvanometer can be converted into ammeter by connecting:

(a) A low resistance in series **(b)** A low resistance in parallel

(c) A high resistance in series **(d)** None of these

97. A galvanometer can be converted into a voltmeter by connecting a:

(a) High resistance in series **(b)** Low resistance in parallel

(c) High resistance in parallel **(d)** None of these

98. The strength of magnetic field produced inside the solenoid when it has n terns per unit length and current I is:

(a) $B = \mu_o n^2 I^2$ **(b)** $B = \mu_o NI$

(c) $B = \mu_o nI$ **(d)** $B = \mu_o \frac{N}{l}$

99. The expression for charge to mass ratio of an electron is determined by:

(a) $\frac{e}{m} = \frac{r}{VB}$ **(b)** $\frac{e}{m} = \frac{V}{B^2 r^2}$

(c) $\frac{e}{m} = \frac{v}{r}$ **(d)** $\frac{e}{m} = \frac{B}{rv}$

100. The device used for displaying the waveform of given voltage is:

(a) A.C generator **(b)** Cathode ray oscilloscope

(c) D.C generator **(d)** Galvanometer

101. The force which deflects the coil of the galvanometer is called:

(a) Deflecting torque **(b)** Ordinary torque

(c) Reflecting torque **(d)** None of these

102. CRO works by deflecting the beam of electron as they pass through:

(a) Uniform magnetic field

(b) Uniform electric field between two sets of parallel plates

(c) Non-uniform magnetic field

(d) None of these

103. Indirectly heated cathode means that the:

(a) Filament heats the cathode **(b)** Cathode heat, the filament

(c) Grid heats the filament **(d)** None of these

104. The anode in CRO are at:

(a) Lower potential w.r.t cathode **(b)** Higher potential w.r. to cathode

(c) Same potential as cathode **(d)** None of these

105. The grides in CRO is at:

(a) Negative potential w.r.to anode **(b)** Positive potential w.r.to anode

(c) Negative potential w.r.to cathode **(d)** Both (a) and (b)

106. In CRO, there are:

(a) Power deflecting plates **(b)** Two sets of deflecting plates

(c) Three sets of deflecting plats **(d)** None of these

107. The voltage applied across Y-plate deflects the beam:

(a) Vertically on the screen **(b)** Horizentically on the screen

(c) Both (a) and (b) **(d)** None of these

108. The voltage applied across X-plats deflects the beam:

(a) Vertically or the screen **(b)** Horizentically on the screen

(c) Both (a) and (b) **(d)** None of these

109. In CRO, the output waveform of time base generator is:

(a) Circular **(b)** Square

(c) Sinusoidal **(d)** Saw-toothed

110. Saw toothed waveform means that its voltage:

(a) Decreases linearly with time

(b) Increases linearly with time

(c) Increases linearly with time and then drops to zero

(d) None of these

111. By means of waveform displayed on the screen of CRO, we can measure:

(a) Frequency of voltage **(b)** Voltage

(c) Phase of voltage **(d)** All of above

112. An instrument which can measure potential without drawing any current is called:

(a) Voltmeter **(b)** Potentiometer

(c) CRO **(d)** Ammeter

113. The cathode ray oscilloscope is useful for:

(a) A volt meter

(b) Wave shape of rapidly charging lubricants

(c) Measuring time interval between electrical plates

(d) All of the above

114. What is emitted by the hot metal filament in a cathode ray oscilloscope:

(a) Electron **(b)** X-plates

(c) Protons **(d)** Y-plates

115. How are the electrons produced in a cathode ray oscilloscope:

(a) By heating a metal filament **(b)** By ionization of the air

(c) By applying an electric field **(d)** None of these

116. The function of grid in cathode ray oscilloscope is:

(a) To control the number of electrons accelerated by anode

(b) To control the brightness of spot formed on the screen

(c) Both (a) and (b)

(d) None of these

117. The electron gun in cathode ray oscilloscope consists of:

(a) Grid **(b)** Three anodes

(c) Indirectly heated cathode **(d)** All of the above

118. The current passing through the coil of galvanometer is directly proportional to:

(a) Angle of deflection **(b)** Magnetic field

(c) Number of turns **(d)** Resistance of the coil

119. What is the current in a wire of 10 cm long at right angle to a magnetic field of 0.5 T when force acting on the wire is 5 N:

(a) I = 10 A **(b)** I = 50 A

(c) I = 500 A **(d)** I = 100 A

120. When a charged particle moves through a magnetic field, the field changes the particle:

(a) Mass **(b)** Energy

(c) Speed **(d)** Direction of motion

121. Which one of the following particles moving in the magnetic field cannot be deflected:

(a) Neutron **(b)** α-particle

(c) β-particle **(d)** Proton

122. The working of galvanometer depends upon:

(a) Material of the coil **(b)** Torque exerted on the coil

(c) Magnetic force exerted on the coil **(d)** None of the above

123. For accurate measurement of current through a circuit, the resistance of ammeter should be:

(a) Very small **(b)** Very high

(c) Neither small nor high **(d)** None of the above

124. To convert a galvanometer into an ammeter, the shunt resistance is given by:

(a) $R_S = \frac{IgRg}{I + Ig}$ **(b)** $R_S = \frac{IgRg}{I - Ig}$

(c) $R_S = \frac{I - Ig}{I} \times Rg$ **(d)** $RS = (I - Ig)\, Rg$

125. To convert a galvanometer into a voltmeter, a high resistance R_h connected in series with the galvanometer is given by:

(a) $R_h = \frac{V}{Rg} - Ig$ **(b)** $R_h = \frac{R_g}{V} - Ig$

(c) $R_h = \frac{V}{Ig} - Rg$ **(d)** $R_h = \frac{V}{Rg} + Ig$

126. To measure potential difference across a resistor, voltmeter is always connected in:

(a) Parallel

(b) Series

(c) Some times in series and some times in parallel

(d) None of the above

127. A device which can measure current, potential difference and resistance accurately is called:

(a) Ammeter **(b)** Voltmeter

(c) AVO meter **(d)** Ohm meter

128. In CRO when beam of electrons falls on a screen it makes a visible spot because the screen is:

(a) Rough **(b)** Fluorescent

(c) Polished **(d)** Clear

129. In CRO when cathode is heated by a filament it emits:

(a) Protons **(b)** Electrons

(c) Rays **(d)** Radiation

130. Force on a moving charge in magnetic field is maximum when angle between velocity and magnetic field is:

(a) $\theta = 90°$ **(b)** $\theta = 270°$

(c) $\theta = 180°$ **(d)** $\theta = 360°$

131. The force on a moving charge in magnetic field is zero when angle between velocity and magnetic field is:

(a) $\theta = 0°$ OR $180°$ **(b)** $\theta = 90°$

(c) $\theta = 270°$ **(d)** $\theta = 45°$

132. The unit of magnetic force is:

(a) Tesla **(b)** Gauss

(c) Newton **(d)** Ampere

133. The galvanometer usually consists of a:

(a) Coil placed in a magnetic field **(b)** Coil placed in an electric field

(c) Coil and a scale only **(d)** None of these

134. The coil of a galvanometer is suspended between the poles of a U-shaped magnet which are:

(a) Concave shaped **(b)** Convex shaped

(c) Plane-shaped **(d)** Spherical shaped

135. The rectangular coil of a galvanometer is made of:

(a) Enameled steel wire **(b)** Copper wire

(c) Enameled copper wire **(d)** None of these

136. To make the field stronger near the coil of the galvanometer, we place inside the coil a:

(a) Soft iron cylinder **(b)** Soft steel cylinder

(c) Soft copper cylinder **(d)** None of these

137. A moving coil galvanometer is based on the following effect of current:

(a) Chemical effect **(b)** Magnetic effect

(c) Heating effect **(d)** All

138. While construction a galvanometer, the enameled copper wire is wound on:

(a) Magnetic material **(b)** An insulator

(c) A conductor **(d)** Non-magnetic material

139. Redial magnetic field is used in a galvanometer so that the galvanometer scale is:

(a) Exponential **(b)** Circular

(c) Linear **(d)** None of these

140. In lamp and scale arrangement for measures the angle of deflection, the scale is:

(a) Translucent **(b)** Mass scale

(c) Transparent **(d)** None of these

141. In a pivoted type galvanometer, the coil is pivoted between two:

(a) Bearings **(b)** Jewels

(c) Jewelled bearings **(d)** All are correct

142. Such a galvanometer in which the coil comes to rest quickly after the current passed through it is called:

(a) Stable galvanometer **(b)** Sensitive galvanometer

(c) Both (a) and (b) **(d)** None of these

143. A moving coil galvanometer can be converted into:

(a) Voltmeter **(b)** Ohmmeter

(c) Ammeter **(d)** All of above

144. An AVO meter is also called:

(a) A mullti meter **(b)** An ammeter

(c) An ohmmeter **(d)** None of these

145. To convert a galvanometer into an ammeter, we connect with it a:

(a) Shunt resistance **(b)** Low value parallel

(c) Low value by pass resistor **(d)** All of above

146. To convert a galvanometer into a voltmeter, we connect with it a:

(a) Shunt resistance **(b)** A high value series resistance

(c) Parallel resistance **(d)** None of these

147. The resistance of shunt is:

(a) Verge large **(b)** Very small

(c) Both (a) and (b) **(d)** None of these

148. An AVO meter can measure:

(a) Potential difference in volt **(b)** Current in Ampere

(c) Resistance in ohms **(d)** All of above

149. When the ohmmeter measures the infinite resistance, its pointer lies at:

(a) Center of the scale **(b)** Left end of the scale

(c) Right end of the scale **(d)** None of these

150. A proper combination of a galvanometer and a series resistance acts as:

(a) Voltmeter **(b)** Ammeter

(c) Ohmmeter **(d)** None of these

151. The relation between current I and angle of deflection in a moving coil galvanometer is:

(a) $I \times \frac{1}{\theta}$ **(b)** $I \times \cos\theta$

(c) $I \times \theta$ **(d)** $I \times \sin\theta$

152. Which of the following is correct?

(a) $1\ T = 10^3\ G$ **(b)** $1\ T = 10^4\ G$

(c) $1\ T = 10^{-4}\ G$ **(d)** None of these

153. Two parallel wires carrying current in opposite direction:

(a) Repel each other **(b)** Attract each other

(c) No effect on each other **(d)** None of these

154. Which one of the following is not deflected by magnetic field?

(a) α-particle **(b)** β-particle

(c) Neutrons **(d)** None of these

155. If an electron enters the magnetic field at right angle from left and $\vec{B}$ is into paper, electron will be deflected:

(a) Upward **(b)** Downward

(c) No deflection **(d)** None of these

156. A solenoid 15 cm, long has 300 turns, I = 5A, B =

(a) $1.3 \times 10^{-2}\ wbm^{-2}$ **(b)** $1.3 \times 10^{2}\ wb\ m^{-2}$

(c) $1.3 \times 10^{-2}\ G$ **(d)** $1.3 \times 10^{-2}\ wb$

157. The sensitvity of galvanometer can be increased by decreasing:

(a) Area of coil **(b)** Magnetic field

(c) Number of turns of coil **(d)** Torsional constant

158. Pole pieces of magnet in galvanometer are made concave to make field:

(a) Radial **(b)** Strong

(c) Both (a), (b) **(d)** Weaker

159. In a velocity selector, particle pass through it if:

(a) $\vec{F}_e = \vec{F}_B$ **(b)** $\vec{F}_e = \vec{F}_g$

(c) $\vec{Fe} = \vec{F}_B^{\,2}$ **(d)** $\vec{F}_e = -\vec{F}_B$

160. Unit of permeability of free space is:

(a) $wbA^{-1}m^{-1}$ **(b)** NmA^{-1}

(c) $Nm^{o}A^{-2}$ **(d)** None of these

161. Magnetic field inside a solenoid is:

(a) Zero **(b)** Minimum

(c) Maximum **(d)** None of these

162. In finding the value of e/m, apparatus used is:

(a) Cavendish **(b)** Teltron tube

(c) Mass spectrograph **(d)** None of these

163. In finding the value of e/m, velocity of electron can be calculated by using:

(a) Potential difference **(b)** Velocity selector

(c) Both (a), (b) **(d)** None of these

164. In case of torque on a current carrying coil α is angle between:

(a) $\vec{B}$ and $\vec{A}$ **(b)** $\vec{B}$ and coil

(c) $\vec{B}$ and plane of coil **(d)** None of these

165. A galvanometer in which magnet rotates is:

(a) Moving coil **(b)** Tangent

(c) Ballistic **(d)** None of these

166. We define sensitivity (current) of a galvanometer as the current in μA required to produce ———— deflection on a scale placed one metre away from mirror of galvanometer.

(a) 1 mm **(b)** 2 mm

(c) 1 cm **(d)** 1 m

167. In lamp and scale arrangement, mirror used is:

(a) Convex mirror **(b)** Convex lens

(c) Concave mirror **(d)** None of these

ANSWERS

1.	(d)	**2.**	(a)	**3.**	(a)	**4.**	(c)	**5.**	(a)
6.	(c)	**7.**	(b)	**8.**	(a)	**9.**	(c)	**10.**	(b)
11.	(a)	**12.**	(a)	**13.**	(d)	**14.**	(d)	**15.**	(c)
16.	(a)	**17.**	(c)	**18.**	(a)	**19.**	(b)	**20.**	(a)
21.	(b)	**22.**	(d)	**23.**	(b)	**24.**	(b)	**25.**	(b)
26.	(b)	**27.**	(a)	**28.**	(d)	**29.**	(a)	**30.**	(c)
31.	(a)	**32.**	(b)	**33.**	(d)	**34.**	(a)	**35.**	(c)
36.	(a)	**37.**	(a)	**38.**	(b)	**39.**	(c)	**40.**	(a)
41.	(d)	**42.**	(c)	**43.**	(c)	**44.**	(d)	**45.**	(d)
46.	(b)	**47.**	(c)	**48.**	(b)	**49.**	(a)	**50.**	(c)
51.	(b)	**52.**	(a)	**53.**	(c)	**54.**	(b)	**55.**	(a)
56.	(a)	**57.**	(d)	**58.**	(b)	**59.**	(b)	**60.**	(a)
61.	(a)	**62.**	(a)	**63.**	(a)	**64.**	(c)	**65.**	(a)
66.	(a)	**67.**	(b)	**68.**	(c)	**69.**	(a)	**70.**	(b)
71.	(a)	**72.**	(a)	**73.**	(c)	**74.**	(a)	**75.**	(b)
76.	(a)	**77.**	(b)	**78.**	(b)	**79.**	(d)	**80.**	(a)
81.	(a)	**82.**	(a)	**83.**	(a)	**84.**	(a)	**85.**	(b)
86.	(b)	**87.**	(b)	**88.**	(a)	**89.**	(a)	**90.**	(b)
91.	(a)	**92.**	(d)	**93.**	(a)	**94.**	(b)	**95.**	(d)
96.	(b)	**97.**	(a)	**98.**	(c)	**99.**	(b)	**100.**	(b)
101.	(a)	**102.**	(a)	**103.**	(a)	**104.**	(b)	**105.**	(c)
106.	(b)	**107.**	(a)	**108.**	(b)	**109.**	(d)	**110.**	(c)
111.	(d)	**112.**	(b)	**113.**	(b)	**114.**	(a)	**115.**	(a)
116.	(c)	**117.**	(d)	**118.**	(a)	**119.**	(d)	**120.**	(d)
121.	(c)	**122.**	(b)	**123.**	(a)	**124.**	(b)	**125.**	(c)
126.	(a)	**127.**	(c)	**128.**	(b)	**129.**	(b)	**130.**	(a)
131.	(a)	**132.**	(c)	**133.**	(a)	**134.**	(a)	**135.**	(c)
136.	(a)	**137.**	(b)	**138.**	(d)	**139.**	(c)	**140.**	(a)
141.	(c)	**142.**	(b)	**143.**	(d)	**144.**	(a)	**145.**	(c)
146.	(b)	**147.**	(b)	**148.**	(d)	**149.**	(b)	**150.**	(a)
151.	(c)	**152.**	(b)	**153.**	(a)	**154.**	(c)	**155.**	(b)
156.	(b)	**157.**	(d)	**158.**	(c)	**159.**	(d)	**160.**	(a)
161.	(c)	**162.**	(b)	**163.**	(c)	**164.**	(c)	**165.**	(b)
166.	(a)	**167.**	(c)						

ELECTROMAGNETIC INDUCTION

Each question has four possible answers, tick (✓) the correct answer:

1. The induced emf in a circuit depends upon:

(a) Maximum magnetic flux **(b)** Change in magnetic flux

(c) Initial magnetic flux **(d)** Rate of charge of magnetic flux

2. The induced current in a circuit depends upon:

(a) Direction of the loop **(b)** Shape of the loop

(c) Resistance of the loop **(d)** Speed of the loop

3. Which one of the following produced first:

(a) Induced emf **(b)** Induced current

(c) Motional emf **(d)** None of the above

4. The induced current can be increased by:

(a) Replacing the loop by a coil **(b)** Moving the loop faster

(c) Using the strong magnetic field **(d)** All of the above

5. The magnitude of motional emf is given by:

(a) $\varepsilon = -VBL$ **(b)** $\varepsilon = VBL$

(c) $\varepsilon = \frac{V}{BL}$ **(d)** $\varepsilon = -\frac{L}{VB}$

6. If a closed metallic loop is moved across a magnetic field then:

(a) Induced current is produced in it **(b)** No induced current is produced

(c) Magnet will attract the loop **(d)** None of above

7. The Phenomenon by which an induced emf is produced in the conductor due to change of magnetic flux in it is called:

(a) Electro magnetism **(b)** Electromagnetic induction

(c) Electric polarization **(d)** All of above

8. The current produced by moving a loop (wire) across the magnetic field is called:

(a) Alternating current **(b)** Direct current

(c) Induced current **(d)** None of these

9. An emf is set up in a conductor when it:

(a) Moves across the magnetic field **(b)** Is kept in the magnetic field

(c) Is kept in an electric field **(d)** None of these

10. The phenomenon of production of induced emf is called:

(a) Magnetic induction **(b)** Electromagnetic induction

(c) Both (a) and (b) **(d)** None of these

11. In magnet-coil experiment, emf can be produced by:

(a) Motion of loop and magnet

(b) Keeping the magnet stationary and moving the coil

(c) Keeping the coil stationary and moving magnet

(d) All of above

12. Michael Faraday and Joseph Henry belongs to:

(a) England and USA **(b)** France and USA

(c) China and USA **(d)** None of these

13. A coil of constant area is placed in a constant magnetic field, an induced current is produced in the coil when:

(a) The coil is rotated **(b)** The coil is stationary

(c) Both (a) and (b) **(d)** None of these

14. The unit of induced emf is:

(a) Ampere **(b)** Volt

(c) Joule/coulomb **(d)** Both (b) and (c)

15. When the conductor is moved with its length parallel to the lines of magnetic field:

(a) emf passes through the conductor **(b)** emf is induced across its ends

(c) Both (a) and (b) **(d)** None of these

16. The law of electromagnetic induction is related to:

(a) Lenz **(b)** Faraday

(c) Coulomb **(d)** Ampere

17. Faraday's law of electromagnetic induction has been used in the construction of:

(a) Electric generator **(b)** Ammeter

(c) Galvanometer **(d)** All of above

18. The Lenz's law refers to:

(a) Induced current **(b)** Induced emf

(c) Both (a) & (b) **(d)** None of these

19. When we say that Lenz law refers to induced currents, it means that we can apply it directly to:

(a) Open circuits **(b)** Closed conducting loop

(c) Every circuits **(d)** None of these

20. The current produced due to electromagnetic induction is called:

(a) Electric current **(b)** Conventional current

(c) Induced current **(d)** All of above

21. The emf produced by the motion of a coil across the magnetic field is called:

(a) Motional emf **(b)** emf

(c) Induced emf **(d)** None of the above

22. The rate of change of magnetic flux is directly proportional to the induced emf is called:

(a) Lenz law **(b)** Faraday's law

(c) Oersted law **(d)** None of them

23. Mathematically Faraday's law can be expressed as:

(a) $\varepsilon = N\frac{\Delta\phi}{\Delta t}$ **(b)** $\varepsilon = -N\frac{\Delta\phi}{\Delta t}$

(c) $\varepsilon = -N\frac{\Delta I}{\Delta t}$ **(d)** $\varepsilon = N\frac{\Delta t}{\Delta\phi}$

24. The direction of induced current is always so as to oppose the change which causes the current, this is the statement of:

(a) Lenz's law **(b)** Faraday's law

(c) Ampere's law **(d)** Coulomb's law

25. Lenz's law is also statement of:

(a) Law of conservation of charge **(b)** Law of conservation of energy

(c) Law of conservation of mass **(d)** Law of conservation of momentum

26. Faraday's law was deduced in:

(a) 1830 **(b)** 1841

(c) 1831 **(d)** 1931

27. Lenz's law presented in:

(a) 1834 **(b)** 1934

(c) 1826 **(d)** 1836

28. Lenz was a ———— physicist.

(a) Japan **(b)** China

(c) Russian **(d)** None of above

29. When we study the phenomenon mutual induction between two coils, the primary coil consists of:

(a) A rheostat and battery **(b)** A rheostat and galvanometer

(c) Galvanometer only **(d)** None of these

30. When we study mutual induction between two coils, the secondary coil circuit consists of:

(a) A rheostat and battery **(b)** A battery only

(c) A galvanometer only **(d)** A rheostat only

31. The emf induced in the secondary coil is directly proportional to:

(a) Rate of change of magnetic flux **(b)** Rate change of electric flux

(c) Change of magnetic flux **(d)** All of above

32. The negative sign in the equation $\varepsilon_s = -M\frac{\Delta I}{\Delta t}$ shows that the induced emf in such a direction that it:

(a) Favours the current in the primary coil

(b) Opposes the current in the primary coil

(c) Opposes the change of current in the primary coil

(d) None of these

33. The negative sign in the equation $\varepsilon_L = -L\frac{\Delta I}{\Delta t}$ can be explained by:

(a) Lenz's law **(b)** Faraday's law

(c) Ampere's law **(d)** None of these

34. If the current in the coil itself is increased by rheostat, the emf induced will be:

(a) Opposite to that of battery **(b)** In the same direction at that of battery

(c) Both (a) and (b) **(d)** None of these

35. Inductors behaves like the:

(a) Resistors in D.C circuit **(b)** Resistors in A.C circuit

(c) Both (a) and (b) **(d)** None of these

36. A coil of wire is also called:

(a) Insulator **(b)** Semi-conductor

(c) Inductor **(d)** All of above

37. The energy can be stored in the:

(a) Magnetic field of an inductor **(b)** Electric field of the capacitor

(c) Magnetic field of the capacitor **(d)** Both (a) and (b)

38. The symbol U_m represents:

(a) Energy density inside the coil **(b)** Energy stored in a conductor

(c) Energy stored in an inductor **(d)** All of above

39. Self inductance of an iron-cored coil can be calculated by:

(a) $L = \mu_o NnA$ **(b)** $L = \mu_o n^2 Al$

(c) $L = \frac{N\phi}{I}$ **(d)** All of above

40. Energy stored per unit volume inside a long solenoid is known as:

(a) Energy density **(b)** Power density

(c) Energy **(d)** Surface charge density

41. The phenomenon in which a change of current in one coil induces an emf in the other coil is called:

(a) Self induction **(b)** Mutual induction

(c) Electric induction **(d)** None of above

42. Mathematically the mutual inductance may be defined as:

(a) $\frac{-\varepsilon_s}{\left(\frac{\Delta I}{\Delta t}\right)p}$ **(b)** $\frac{\varepsilon}{\left(\frac{\Delta t}{\Delta I}\right)p}$

(c) $\frac{\varepsilon}{\left(\frac{\Delta V}{\Delta t}\right)p}$ **(d)** None of these

43. The SI unit of mutual inductance is:

(a) Farad **(b)** Coulomb

(c) Henry **(d)** Ampere

44. Which of the following is scalar:

(a) Flux density **(b)** emf

(c) Magnetic flux **(d)** Both (a) and (b)

45. The practical Illustration of the phenomenon of mutual induction in:

(a) Transformer **(b)** D.C. dynamo

(c) A.C. generator **(d)** None of these

46. One henry is equal to:

(a) 1 ohm × 1 sec **(b)** 1 ohm × 1 hertz

(c) 1 ohm × 1 metre **(d)** All of above

47. A magnetic compass will be deflected if it is kept near a:

(a) Charge at rest **(b)** Charge in motion

(c) Positive charge at rest **(d)** None of them

48. The phenomenon of producing emf in a coil due to the change of current in itself is called:

(a) Self induction **(b)** Mutual induction

(c) Inductance **(d)** Both (a) and (b)

49. The SI unit of self inductance is:

(a) Ampere **(b)** Coulomb

(c) Farad **(d)** Henry

50. Self induction is expressed as:

(a) $\varepsilon_L = -\frac{\Delta I}{\Delta t}$ **(b)** $\varepsilon_L = -L\frac{\Delta I}{\Delta t}$

(c) $\varepsilon_L = \frac{\Delta\phi}{\Delta t}$ **(d)** $\varepsilon_L = -L\frac{\Delta t}{\Delta I}$

51. The mutual induction between the two coils depends upon:

(a) Area of the coil **(b)** Number of turns

(c) Distance between the coil **(d)** All of the above

52. The self induction does not depend upon:

(a) Core material **(b)** Weight of coil

(c) Number of turns of the coil **(d)** Area of coil

53. The energy stored in a magnetic field is given by:

(a) $E = \frac{1}{2} LI^2$ **(b)** $E = \frac{1}{2}\frac{Q^2}{C}$

(c) $E = \frac{1}{2} L^2 I$ **(d)** LI^2

54. Self inductance of a long solenoid is given by:

(a) $L = \frac{\mu_o n^2}{l}$ **(b)** $L = \mu_o N I^2 A$

(c) $L = \mu_o n^2 A l$ **(d)** None of the above

55. The ratio of the self-induced emf to the rate of change of current in the coil is known as:

(a) Mutual induction **(b)** Self induction

(c) Self inductance **(d)** Mutual inductance

56. The ratio of the emf in the secondary coil to the rate of change of current in the primary coil is known as:

(a) Mutual induction **(b)** Self induction

(c) Mutual inductance **(d)** Both (a) and (c)

57. If one coil is wound on an iron core, the flux through it will:

(a) Remains constant **(b)** Decrease

(c) Increase **(d)** Becomes zero

58. A 50 mH coil carries a current of 2A. The energy stored in its magnetic field is:

(a) E = 005 J **(b)** E = 10J

(c) E = 0.1 J **(d)** E = 50 J

59. The motional emf produced in a conductor depends upon:

(a) Magnetic field **(b)** Length

(c) Material of the conductor **(d)** All of the above

60. A.C. generator is a device which converts:

(a) Electrical energy into mechanical energy **(b)** Mechanical energy into electrical energy

(c) Chemical energy into mechanical energy **(d)** Heat energy into electrical energy

61. The magnitude of the emf induced in the coil of A.C generator is given by:

(a) $\varepsilon = N\omega AB \sin\theta$ **(b)** $\varepsilon = \dfrac{\omega ABN}{\sin\theta}$

(c) $\varepsilon = \dfrac{B \sin\omega t}{N\omega A}$ **(d)** all of above

62. A device that converts mechanical energy into electrical energy is called:

(a) A.C generator **(b)** Motor

(c) Converter **(d)** Vibrator

63. Energy stored per unit volume inside a solenoid is:

(a) $\frac{1}{2}\frac{E^2}{\mu_o}$ **(b)** $\frac{1}{2}\frac{B^2}{\mu_o}$

(c) $\frac{B^2}{\mu_o}$ **(d)** $\frac{EB}{2\mu_o}$

64. A.C is converted into D.C by:

(a) Dynamo **(b)** Rectifier

(c) Motor **(d)** Transformer

65. An electric motor converts:

(a) Mechanical energy into electrical energy **(b)** Electrical energy into mechanical energy

(c) Magnetic energy into mechanical energy **(d)** None of the above

66. Emf produced by A.C generator depends upon:

(a) Magnetic field strength **(b)** Number of turns in the coil

(c) Frequency of rotation **(d)** All the above

67. Slip rings are used in:

(a) Electric motor **(b)** D.C Dynamo

(c) A.C generator **(d)** None of above

68. The product of induced current and resistance is always:

(a) Lesser **(b)** Greater

(c) Constant **(d)** None of above

69. Energy can be stored in a magnetic field of:

(a) Inductor **(b)** Resistance

(c) Solenoid **(d)** Capacitor

70. The principle of electric generator is based on:

(a) Faradays law **(b)** Lenz law

(c) Ampere's law **(d)** None of above

71. The Lenz's law refers to induced ————————.

(a) Current **(b)** emf

(c) Both (a) and (b) **(d)** None of them

72. Alternating emf is produced by rotating a coil of wire in:

(a) Electric field **(b)** Magnetic field

(c) Conservative field **(d)** Gravitational field

73. An alternating current is that which:

(a) Flows intermediately

(b) Varies in magnitude

(c) Reverses its direction several times per second

(d) None of the above

74. An alternating current is converted into direct current by:

(a) Dynamo **(b)** Transformer

(c) Rectifier **(d)** Motor

75. The only difference between construction of D.C. generator and an A.C generator is that of:

(a) Commutator **(b)** Coil

(c) Carbon brushes **(d)** Magnetic field

76. A transformer is a device which:

(a) Steps up D.C voltage **(b)** Steps down D.C voltage

(c) Steps up or steps down A.C. voltage **(d)** None of above

77. A transformer consists of an iron core with:

(a) A secondary coil **(b)** A primary coil

(c) Neither primary nor secondary **(d)** Primary coil and secondary coil

78. A device consisting of two coils wound on iron core is called a:

(a) Electric motor **(b)** A.C generator

(c) Transformer **(d)** D.C. generator

79. The practical application of the phenomenon of mutual induction is:

(a) A.C generator **(b)** D.C generator

(c) Electric motor **(d)** Transformer

80. Who invented commutator:

(a) William Black **(b)** William Smith

(c) William Sturgeon **(d)** Mosley

81. Commutator was invented in:

(a) 1834 **(b)** 1820

(c) 1840 **(d)** 1835

82. Work can be stored in an inductor as:

(a) Elastic P.E **(b)** Electrical P.E

(c) Gravitational P.E **(d)** Kinetic energy

83. Energy stored per unit volume inside the solenoid is called:

(a) Mass density **(b)** Energy density

(c) Charge density **(d)** Volume density

84. A current which reverses its direction in each second is called:

(a) Alternating current **(b)** Direct current

(c) Induced current **(d)** None of these

85. Alternating current generator use:

(a) Split rings **(b)** Slip rings

(c) Loop rings **(d)** Coiled rings

86. The direction of the induced emf during electromagnetic induction can be determined by the use of:

(a) Amperes law **(b)** Coulomb's law

(c) Lenz's law **(d)** Faraday's law

87. A generator running in reverse direction may be called as:

(a) D.C generator **(b)** Commutator

(c) Motor **(d)** A.C generator

88. For the use of an electric lamp of low voltage on A.C main of high voltage, we use the device called ————————.

(a) Resistor **(b)** Rheostat

(c) Transformer **(d)** Solenoid

89. Lenz's law provides a relation between:

(a) Current and magnetic field

(b) Force on a current carrying conductor and magnetic field

(c) Induced emf and the rate of change of magnetic flux

(d) None of these

90. Lenz's law does not violated the principle of:

(a) Conservation of mass **(b)** Conservation of energy

(c) Conservation of charge **(d)** Conservation of momentum

91. A straight line conductor of length 0.4 m is moved with speed of 7m/s perpendicular to the magnetic field 0.9 Wb/m^2. The induced emf across the conductor is:

(a) 1.26 volt **(b)** 25.2 volt

(c) 2.52 volt **(d)** 5.04 volt

92. The direction of the induced emf during electromagnetic induction is determined by:

(a) Lenz's law **(b)** Faraday's law

(c) Ampere's law **(d)** None of these

93. The knowledge of electromagnetic induction has been used in construction of:

(a) Galvanometer **(b)** Voltmeter

(c) Electric motor **(d)** A.C generator

94. If the north pole of a magnet moves away from a metallic ring. Then the current flows:

(a) Clockwise **(b)** Anticlockwise

(c) First clockwise and then anticlockwise **(d)** None of above

95. If the number of turn in a coil is increased metallic ring to 3 times than its initial number, then the magnetic flux linked with is:

(a) Becomes one third of its initial value **(b)** Remains unchanged

(c) Becomes nine times of its initial value **(d)** Increased by 3 times

96. The movable wire is moved to the right causing an anticlockwise induced current. The direction of magnetic induction in the region P.

(a) Points to the right **(b)** Points to the left

(c) Points up the paper **(d)** Points down into the paper

97. When the rate of change of current in a coil is unity then the induced emf is equal to:

(a) Number of turns of the coil **(b)** Total flux linked with the coil

(c) Coefficient of self inductance **(d)** None of the above

98. When a current carrying conductor placed in an external magnetic field, experience a force. The device whose working based on this principle is:

(a) Electric bell **(b)** Electric motor

(c) Dynamo **(d)** None of these

99. If the load in the external circuit is greater, the current supplied by the generator is:

(a) Very small **(b)** Very large

(c) No change **(d)** None of these

100. A wire carrying the current placed in a magnetic field experience a force, this is the basic principle of:

(a) Transformer **(b)** D.C generator

(c) A.C generator **(d)** Electric motor

101. An electric motor consists of:

(a) An armature **(b)** A commutator

(c) Magnetic field **(d)** All of above

102. The windings of an electromagnet used in motors are called:

(a) Armature coil **(b)** Primary coil

(c) Secondary coil **(d)** Field coils

103. When a motor rotates, emf is induced. This induced emf is in such a direction that:

(a) Helps the emf running the motor **(b)** Opposes the emf running the motor

(c) Both (a) and (b) **(d)** None of these

104. In case of a motor, if V is the applied emf and ε is the back emf then net emf in the circuit is:

(a) $V - \varepsilon$ **(b)** $V + \varepsilon$

(c) $V \times \varepsilon$ **(d)** $\frac{\varepsilon}{V}$

105. If R is the resistance of the motor coil and I is the current drawn by the motor, then ohm's law gives:

(a) $V = IR - \varepsilon$ **(b)** $V = \varepsilon + IR$

(c) $V = \varepsilon - IR$ **(d)** $V = \frac{IR}{\varepsilon}$

106. When the motor is just started, the back emf is:

(a) Maximum and no current pass through the coil

(b) Minimum and a large current pass through the coil

(c) Zero and large current passes through the coil

(d) All of above

107. The output of a dynamo using a split ring commutator is:

(a) Half wave rectified voltage **(b)** A.C

(c) D.C **(d)** Fluctuating D.C

108. An electric motor:

(a) Generates mechanical energy

(b) Generates electric energy

(c) Converts mechanical energy into electric energy

(d) Converts electrical energy into mechanical energy

109. A dynamo is sometimes said to generate electricity it actually acts as a source of:

(a) Charge **(b)** emf

(c) Energy **(d)** Magnetism

110. A d.c electric motor is based on the interaction of current and magnetic field and the principle employed is the same as in a:

(a) Converter **(b)** Thermo couple

(c) d.c dynamo **(d)** d.c galvanometer

111. A transformer:

(a) Transform voltage **(b)** Transforms energy

(c) Transforms frequency **(d)** Generates emf

112. To step up voltage, the number of turns in the secondary should be:

(a) Less than the number of turns in the primary

(b) Greater than the number of turns in the primary

(c) Equal the number of turns in the primary

(d) Infinite

113. In a step up transformer, voltage in the secondary increases and current.

(a) Decreases **(b)** Increases

(c) Remain unchanged **(d)** None of the above

114. A transformer has no:

(a) Hystresis loss **(b)** Copper loss

(c) Both (a) and (b) **(d)** Mechanical loss

115. A transformer has:

(a) Two coil

(b) Only one coil

(c) Works on the principle of mutual induction

(d) None of these

116. The coil from which the power is delivered to the circuit is called:

(a) Primary coil **(b)** Secondary coil

(c) Field coil **(d)** None of these

117. The coils of a transformer are:

(a) Magnetically linked **(b)** Electrically linked

(c) Both (a) and (b) **(d)** None of these

118. The transformer equation is:

(a) $\frac{v_s}{v_p} = \frac{I_p}{I_s}$ **(b)** $\frac{v_s}{v_p} = \frac{N_s}{N_p}$

(c) $\frac{N_s}{N_p} = \frac{I_p}{I_s}$ **(d)** All of above

119. In an ideal case, the rate of change of flux in the secondary coil of transformer is:

(a) Equal to that of primary **(b)** Equal to that of secondary

(c) Greater than that of primary **(d)** Smaller than that of primary

120. When current I passes through a resistance R, the power loss due to heating effect is:

(a) Calculated by I^2R **(b)** Zero

(c) Maximum **(d)** All of above

121. In order to minimize the power loss during transmission:

(a) Resistance is reduced **(b)** Current is increased

(c) Potential difference is increased **(d)** Current is reduced

122. In a practical transformer, the output is always:

(a) Equal to input **(b)** Less than input

(c) Greater than input **(d)** None of these

123. The main cause of power loss in transformer is:

(a) Hysteresis **(b)** Eddy current

(c) Both (a) and (b) **(d)** None of these

124. Eddy currents are the induced currents which are setup:

(a) In a direction perpendicular to the flux **(b)** Along the flux lines

(c) Out of flux area **(d)** None of these

125. To improve the efficiency of a transformer:

(a) Insulation should be perfect **(b)** Resistance of both should be least

(c) Core should be laminated **(d)** All of above

126. It is possible to transmit A.C power over long distances without much power loss by:

(a) Commutators **(b)** Transformer

(c) D.C motor **(d)** Thermistors

127. The efficiency of a transformer can be calculated by:

(a) $\eta = \frac{P_{out}}{P_{in}} \times 100$ **(b)** $\eta = \frac{P_{in}}{P_{out}} \times 100$

(c) $\eta = \frac{P_{out} \times P_{in}}{100}$ **(d)** $\eta = \frac{100}{P_{out} \times P_i}$

128. The turn ratio of setup transformer is the voltage ratio and current ratio respectively will be:

(a) 25, 50 **(b)** 50, 0.02

(c) 0.02, 50 **(d)** 50 volt, 0.02 A

129. The power loss in transformer takes place due to:

(a) Eddy current **(b)** Hysteresis

(c) Magnetic field **(d)** Both (a) and (b)

130. For an ideal transformer:

(a) Power input = Power output **(b)** Power input is less than power output

(c) Power input is greater than power output **(d)** Power output is greater than power input

131. In step down transformer, the number of turns in:

(a) Primary are more **(b)** Primary are less

(c) Primary and secondary are equal **(d)** None of these

132. A transformer works on:

(a) A.C only **(b)** D.C only

(c) High voltage only **(d)** Both A.C and D.C

133. Which one of the following materials is more suitable for making cores of transformer?

(a) Soft iron **(b)** Copper

(c) Nickel **(d)** Aluminum

134. A coil has an inductance of 0.02 Henry. When a current in the coil is changing at the rate of 150 A/S then the induced emf will be:

(a) 3 volt **(b)** 0.3 volt

(c) 1.5 volt **(d)** 0.2 volt

135. In a step down transformer, the input voltage is 200 V and the output voltage is 5 volts the turn ratio of the transformer is:

(a) 1:20 **(b)** 1:40

(c) 20:1 **(d)** 40:1

136. A 25 watt and 100 watt bulbs are joined in series and connected to the mains. Which bulb will glow brighter?

(a) 100 watt **(b)** 25 watt

(c) First 25 and then 100watt **(d)** None of these

137. A coil of 10 cm × 20 cm having 40 turns in making 18.00 rev/min in a magnetic field 0.5 wb/m^2. The peak value of the induced emf is:

(a) 113 volt **(b)** 226 volt

(c) 339 volt **(d)** 452 volt

138. When the back emf in a current is zero, it draws.

(a) Zero current **(b)** Maximum current

(c) Minimum current **(d)** Steady average current

139. A loop of wire is suspended between poles of a magnet with its plane parallel to pole faces. What happens if A.C. is used?

(a) Coil oscillate **(b)** Coil rotate

(c) Coil remain at rest **(d)** Both (a), (b)

140. Motional e.m.f. in the stationary rod is:

(a) VBL sin θ **(b)** –VBL sin θ

(c) Both (a), (b) **(d)** Zero

141. 1 Henry =

(a) VSA^{-1} **(b)** $VS^{-1}A^{-1}$

(c) $V^{-1}SA$ **(d)** VSA^{-2}

142. When motor just started, back e.m.f. is almost:

(a) Maximum **(b)** Minimum

(c) Zero **(d)** None of these

143. For ideal transformer, V_s is ———— proportional to I_s.

(a) Directly **(b)** Inversely

(c) Both (a), (b) **(d)** None of these

144. Lenz's law is in accordance with law of conservation of:

(a) Mass **(b)** Momentum

(c) Charge **(d)** Energy

145. The phenomenon in which changing current in one coil induces an e.m.f. in another coil is called:

(a) Mutual inductance **(b)** Self induction

(c) Mutual induction **(d)** All of these

146. A dynamo converts:

(a) Electrical energy into mechanical energy **(b)** Mechanical energy into electrical energy

(c) Magnetic energy into electrical energy **(d)** None of these

147. Unit of energy density is:

(a) $\frac{T^2}{wbm^{-1}A^{-1}}$ **(b)** $\frac{J}{m^3}$

(c) Both (a), (b) **(d)** $\frac{kg}{m^3}$

148. In a D.C. motor ———— rings are used.

(a) Slip **(b)** Split

(c) Both (a), (b) **(d)** None of these

149. $\frac{V_s}{V_p} = \frac{N_s}{N_p}$. This relation is true only when ———— of transformer.

(a) Input is open **(b)** Output is open

(c) Both input and output are closed **(d)** Both input and output are open

150. If $\frac{N_s}{N_p} = 50$, $I_p = 20$ A, $V_p = 220$ V, $V_s = ?$

(a) 1100 V **(b)** 11000 V

(c) 500 V **(d)** 1000 V

ANSWERS									
1.	(d)	**2.**	(d)	**3.**	(a)	**4.**	(d)	**5.**	(a)
6.	(a)	**7.**	(b)	**8.**	(c)	**9.**	(a)	**10.**	(b)
11.	(d)	**12.**	(a)	**13.**	(a)	**14.**	(d)	**15.**	(d)
16.	(b)	**17.**	(a)	**18.**	(a)	**19.**	(b)	**20.**	(c)
21.	(a)	**22.**	(b)	**23.**	(b)	**24.**	(a)	**25.**	(b)
26.	(c)	**27.**	(a)	**28.**	(c)	**29.**	(a)	**30.**	(c)
31.	(a)	**32.**	(c)	**33.**	(a)	**34.**	(a)	**35.**	(b)
36.	(c)	**37.**	(a)	**38.**	(c)	**39.**	(d)	**40.**	(a)
41.	(b)	**42.**	(a)	**43.**	(c)	**44.**	(d)	**45.**	(a)
46.	(a)	**47.**	(b)	**48.**	(a)	**49.**	(d)	**50.**	(b)
51.	(d)	**52.**	(b)	**53.**	(a)	**54.**	(c)	**55.**	(c)
56.	(c)	**57.**	(c)	**58.**	(c)	**59.**	(d)	**60.**	(b)
61.	(a)	**62.**	(a)	**63.**	(b)	**64.**	(b)	**65.**	(b)
66.	(d)	**67.**	(c)	**68.**	(c)	**69.**	(a)	**70.**	(a)
71.	(a)	**72.**	(b)	**73.**	(c)	**74.**	(c)	**75.**	(a)
76.	(c)	**77.**	(d)	**78.**	(c)	**79.**	(d)	**80.**	(c)
81.	(a)	**82.**	(b)	**83.**	(b)	**84.**	(a)	**85.**	(b)
86.	(c)	**87.**	(c)	**88.**	(c)	**89.**	(a)	**90.**	(b)
91.	(c)	**92.**	(a)	**93.**	(d)	**94.**	(a)	**95.**	(d)
96.	(d)	**97.**	(c)	**98.**	(b)	**99.**	(a)	**100.**	(d)
101.	(d)	**102.**	(d)	**103.**	(b)	**104.**	(a)	**105.**	(b)
106.	(c)	**107.**	(d)	**108.**	(d)	**109.**	(b)	**110.**	(d)
111.	(a)	**112.**	(b)	**113.**	(a)	**114.**	(d)	**115.**	(c)
116.	(b)	**117.**	(a)	**118.**	(d)	**119.**	(b)	**120.**	(a)
121.	(d)	**122.**	(b)	**123.**	(c)	**124.**	(a)	**125.**	(d)
126.	(b)	**127.**	(a)	**128.**	(b)	**129.**	(d)	**130.**	(a)
131.	(a)	**132.**	(a)	**133.**	(c)	**134.**	(a)	**135.**	(d)
136.	(b)	**137.**	(a)	**138.**	(d)	**139.**	(c)	**140.**	(d)
141.	(a)	**142.**	(c)	**143.**	(b)	**144.**	(d)	**145.**	(c)
146.	(b)	**147.**	(c)	**148.**	(b)	**149.**	(b)	**150.**	(b)

Chapter 16

ALTERNATING CURRENT

Each question has four possible answers, tick (✓) the correct answer:

1. Alternating current is one which changes in a:

(a) Magnitude **(b)** Direction

(c) Magnitude as well as direction **(d)** None of the above

2. If V_{rms} be the root mean square value of emf then its peak to peak value is given by:

(a) $\frac{V_{rms}}{\sqrt{2}}$ **(b)** $\sqrt{2}\, V_{rms}$

(c) $\frac{2}{\sqrt{2}\, V_{rms}}$ **(d)** $\frac{V_{rms}}{2}$

3. If I_o is the peak value of current, then its root mean square value is given by:

(a) $\sqrt{2}\, I_o$ **(b)** $2\, I_o$

(c) I_o **(d)** $0.7\, I_o$

4. A.C can be measure with the help of:

(a) Ammeter (D.C) **(b)** Moving coil galvanometer

(c) Hot wire ammeter **(d)** All of the above

5. For a sine wave, the form factor is given by:

(a) $\frac{\pi}{2\sqrt{2}}$ **(b)** $\frac{\pi}{2}$

(c) $\sqrt{2}\,\pi$ **(d)** $2\sqrt{2}\,\pi$

6. Alternating current is converted to direct current by:

(a) Dynamo **(b)** Motor

(c) Transformer **(d)** Rectifier

7. The out put voltage of an A.C at any time is given by:

(a) $V = V_o \sin \omega t$ **(b)** $V = V_o \cos \frac{2\pi}{T} \times t$

(c) $V = V_o \sin \frac{2\pi}{T} \times t$ **(d)** None of the above

8. The value of capacitive reactance is given by:

(a) $X_c = VI$ **(b)** $X_c = \frac{V}{I}$

(c) $X_c = \frac{I}{V}$ **(d)** All of above

9. The time during which the voltage sources changes its polarity once is called:

(a) Time period **(b)** Critical time

(c) Period of the AC **(d)** None of the above

10. The SI unit of reactance is:

(a) ohm **(b)** Volt – m^{-1}

(c) Volt **(d)** Ampere

11. Alternating current or emf measuring instruments measures its:

(a) r.m.s. value **(b)** Peak value

(c) Average value **(d)** None of the above

12. The average value of A.C over a complete cycle is:

(a) I_o **(b)** $\frac{I}{\sqrt{2}}$

(c) I **(d)** None of the above

13. One complete set of positive and negative value of alternating quantities is called:

(a) Frequency **(b)** Time period

(c) Amplitude **(d)** Cycle

14. Reactance offered by a coil having no resistance in a.c circuit is equal to:

(a) $\frac{1}{\omega L}$ **(b)** ωL

(c) $\omega^2 L^2$ **(d)** ωLR

15. Alternating voltage is:

(a) Varies inversely with time **(b)** Varies directly with time

(c) Independent of time **(d)** Varies sinusoidally with time

16. The alternating current can be transmitted:

(a) Very low cost **(b)** To very high cost

(c) Long distances **(d)** Both (a) and (c)

17. Alternating current is produced by a voltage source which polarity:

(a) Keeps on reversing with time **(b)** Remains the same

(c) Reverses after period T **(d)** None of these

18. The output V of an A.C generator at any instant is given by:

(a) $V = V_o \sin \omega t$ **(b)** $V = Vo \sin \frac{2\pi}{t} T$

(c) $V = Vo \sin \frac{2\pi}{T} t$ **(d)** Both (a) and (c)

19. Using $\theta = \omega t$ and $\omega = \frac{2\pi}{T}$, the angle through which the coil of the A.C generator rotates when $t = \frac{T}{2}$ is:

(a) π **(b)** Zero

(c) $\frac{\pi}{2}$ **(d)** 2π

20. If $V = V_o \sin \omega t$ and $\omega = \frac{2\pi}{T}$, the value of alternating voltage V when $t = \frac{3T}{4}$ is:

(a) $-V_o$ **(b)** V_o

(c) $V_o = 0$ **(d)** None of these

21. The waveform of alternating voltage is the graph between:

(a) Current and time **(b)** Voltage and time

(c) Voltage and current **(d)** Voltage along y-axis and time along x-axis

22. The waveform of alternating voltage is a:

(a) Square **(b)** Sinusoidal

(c) Rectangular **(d)** None of these

23. The peak to peak value of alternating voltage is:

(a) $2V_o$ **(b)** V_o

(c) $\frac{V_o}{2}$ **(d)** None of these

24. The average value of alternating voltage over a complete cycle is:

(a) Zero **(b)** $0.7\ V_{max}$

(c) $0.707\ V_{max}$ **(d)** None of these

25. The RMS value of alternating voltage is:

(a) 0.5 times the peak value **(b)** 0.7 times the peak value

(c) 0.7 times the instantaneous value **(d)** Equal to maximum voltage

26. The alternating voltage or current is actually measured by:

(a) Its RMS value **(b)** Square root of its mean square value

(c) Peak value **(d)** Instantaneous value

27. The magnitude of alternating voltage is:

(a) Always decreases **(b)** Always increases

(c) Always remains the same **(d)** Does not remain the same

28. The basic circuit element in a D.C circuit is:

(a) An inductor **(b)** A resistor

(c) A capacitor **(d)** None of these

29. The basic circuit elements in A.C circuits are:

(a) Thermistor **(b)** Inductor and resistors

(c) Inductor and capacitor **(d)** All of above

30. The maximum current I_o passing through a resistance R connected with an alternating voltage source V_o is given by:

(a) $I_o = R \times V_o$ **(b)** $I_o = \frac{V_o}{R}$

(c) $I_o = \frac{R}{V_o}$ **(d)** $I_o = V_o \times R$

31. In a resistive A.C circuit, instantaneous values of voltage and current are:

(a) In phase **(b)** Out of phase

(c) Lead each other **(d)** None of these

32. The dimensions, of R.C matches with:

(a) $\frac{R}{L}$ **(b)** $\frac{L}{R}$

(c) RL **(d)** None of these

33. At what frequency 1 henry inductance offer same impendance as 1 μF capacitor:

(a) 450 Hz **(b)** 512 Hz

(c) 1 KHz **(d)** 159 Hz

34. A transformer has $\frac{N_2}{N_1} = 10$, the load current is 1.0A, the current in primary is:

(a) 1 A **(b)** 0.1 A

(c) 11 A **(d)** 10 A

35. For resistance, $\vec{V}$ and $\vec{I}$ vectors are drawn:

(a) Parallel to each other **(b)** Perpendicular to each other

(c) Such that $\vec{V}$ leads $\vec{I}$ **(d)** None of these

36. When voltage V and current I are in phase the power is expressed as:

(a) $P = VI \sin\theta$ **(b)** $P = I^2R$

(c) $P = VR$ **(d)** $P = VI \cos\theta$

37. When A.C voltage source is connected to a capacitor:

(a) Voltage V lags behind current I **(b)** Current I leads the voltage V

(c) Voltage leads the current I **(d)** Both (a) and (b)

38. The measure of the opposition offered by a capacitor to the flow of A.C is called:

(a) Reactance **(b)** Resistance

(c) Impedance **(d)** Capacitance

39. Energy in an inductance coil is stored in the form of:

(a) Electrical energy **(b)** Light energy

(c) Magnetic energy **(d)** Heat energy

40. The reactance is the ratio of:

(a) V_{rms}/I_{rms} **(b)** $V_{rms} \times I_{rms}$

(c) I_{rms}/V_{rms} **(d)** $V_{max} \times V_{rms}$

41. In case of capacitor, the unit of reactance is:

(a) Farad **(b)** Ohm

(c) Newton **(d)** All of these

42. The reactance of a coil depends upon:

(a) Inductance of the coil **(b)** Capacitance of the coil

(c) Thickness of the coil **(d)** None of these

43. To maintain the current in an inductor, the applied alternating voltage must be:

(a) Smaller than back emf **(b)** Greater than back emf

(c) Equal to back emf **(d)** None of these

44. When A.C voltage is applied to an inductor, the:

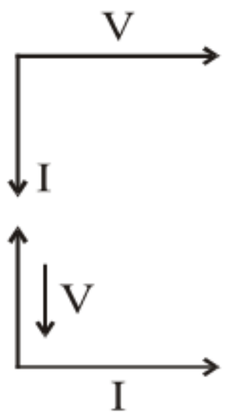
(a) Voltage V leads current I by 90° **(b)** Voltage V leads current I by 270°

(c) Voltage V leads current I by 0° **(d)** None of these

45. The phase diagram for an inductor can be shown as:

(a)

(b)

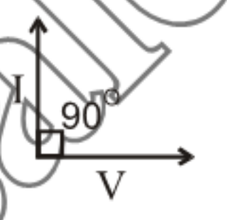


(c)

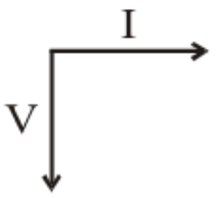
(d)

46. The phase diagram for a capacitor can be shown as:

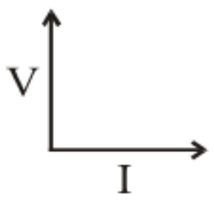
(a)



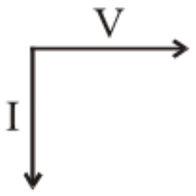
(b)



(c)



(d)



47. If frequency f is in Hz and inductance L is in milli henry, then X_L is in:

(a) milli ohm **(b)** kilo ohm

(c) ohm **(d)** none of these

48. If frequency f is in Hz and capacitance C is in μF then the unit of X_C is:

(a) Mega ohm **(b)** Milli ohm

(c) μ ohm **(d)** None of these

49. Alternating current can be produced by:

(a) Electric motor **(b)** Generator

(c) Turbine **(d)** Transformer

50. Which of the following statement is correct for an A.C circuit:

(a) The current depends upon the components connected in circuit

(b) The current lags the voltage by a phase angle of 90°

(c) The current leads the voltage by a phase angle of 90°

(d) The current and voltage are in same phase

51. Impedance is the combined effect of:

(a) Resistance and inductance **(b)** Resistance and reactance

(c) Inductance and capacitance **(d)** None of these

52. The unit of impedance is:

(a) Farad **(b)** Henry

(c) Tesla **(d)** Ohm

53. In an RLC circuit, the impedance is:

(a) Combined effect of resistance and reactance

(b) Another name of resistance

(c) Another name of inductance and capacitance

(d) None of these

54. The amplitude of the effective current is:

(a) $I_{rms} \cos \theta$ **(b)** $I_{rms} \sin \theta$

(c) $I_o \cos \theta$ **(d)** Infinity

55. The graph between time and voltage is:

(a) tan curve **(b)** Curved line

(c) Sine curve **(d)** Straight line

56. Alternating current can be measured by D.C ammeter because if:

(a) A.C is virtual **(b)** Average current for complete cycle is zero

(c) A.C cannot pass through D.C ammeter **(d)** None of the above

57. The highest value reached by the voltage or current in one cycle is known as:

(a) Peak value **(b)** Minimum value

(c) Average value **(d)** Zero value

58. Inductive reactance ωL of a coil is expressed in:

(a) Ohm **(b)** Ampere

(c) Volt **(d)** None of the above

59. The current flows from $0 \rightarrow T/2$ is:

(a) + ve direction of A.C **(b)** – ve direction of A.C

(c) Towards zero **(d)** None of the above

60. The current flows from T/2 → T is:

(a) – ve direction of A.C **(b)** + ve direction of A.C

(c) Towards zero **(d)** All of the above

61. The most common source of A.C voltage is:

(a) Cell **(b)** A.C generator

(c) A.C transformer **(d)** Motor

62. Voltage drop in A.C circuit is the product of current and:

(a) Impedance **(b)** Inductance

(c) Resistance **(d)** None of the above

63. In a purely capacitive A.C circuit, the current is:

(a) In phase with emf **(b)** The emf by 90°

(c) Leads the emf by 90° **(d)** All of the above

64. With high frequencies, capacitive reactance:

(a) Remain unchanged **(b)** Increases

(c) Decreases **(d)** None of the above

65. With increase of frequency of A.C supply, the inductive reactance is:

(a) Decreases **(b)** Increases as square of frequency

(c) Remain unchanged **(d)** Increases as directly to frequency

66. The natural frequency of L.C circuit is equal to:

(a) $\frac{1}{2\pi}\sqrt{\frac{C}{L}}$ **(b)** $\frac{1}{2\pi}\sqrt{\frac{L}{C}}$

(c) $\frac{1}{2\pi\sqrt{LC}}$ **(d)** $\frac{\sqrt{LC}}{2\pi}$

67. With increase in frequency of an A.C supply, the impedance of LCR series circuit:

(a) Decrease **(b)** Increases

(c) Remains constant **(d)** First decrease, becomes minimum and then increase

68. SI The unit of impedance is:

(a) Hertz **(b)** Henry

(c) Volt **(d)** Ohm

69. An expression for impedance for R.C series circuit is given by:

(a) $Z = \sqrt{R^2 + \frac{1}{\omega c}}$ **(b)** $Z = \sqrt{R + \frac{1}{\omega c}}$

(c) $Z = \sqrt{R^2 + \left(\frac{1}{\omega c}\right)^2}$ **(d)** $Z = \sqrt{\left(R + \frac{1}{\omega c}\right)^2}$

70. The phase angle θ in an R.C series circuit is expressed as:

(a) $\theta = \text{Cos}^{-1}\left(\frac{I}{\omega CR}\right)$ **(b)** $\theta = \tan\left(\frac{1}{\omega CR}\right)$

(c) $\theta = \tan^{-1}\left(\frac{X_C}{R}\right)$ **(d)** None of these

71. The phase angle θ in an R.L series circuit is expressed as:

(a) $\theta = \tan^{-1}\left(\frac{\omega L}{R}\right)$ **(b)** $\theta = \tan\left(\frac{\omega L}{R}\right)$

(c) $\theta = \tan^{-1}\left(\frac{R}{\omega L}\right)$ **(d)** None of these

72. The impedance Z of an R.L series circuit is expressed as:

(a) $Z = \sqrt{(\omega L)^2 + \frac{1}{R^2}}$ **(b)** $Z = \sqrt{R^2 + (\omega L)^2}$

(c) $Z = \sqrt{R^2 + \left(\frac{1}{\omega L}\right)^2}$ **(d)** None of these

73. In an R.L.C series circuit, the quantities which are directed opposite to each other are:

(a) X_C and R **(b)** X_C and X_L

(c) X_C and L **(d)** X_L and C

74. The condition of resonance in an R.L.C series circuit is that:

(a) $X_L = X_C$ **(b)** $X_L > X_C$

(c) $X_L < X_C$ **(d)** None of these

75. The equation which satisfied the resonance condition is:

(a) $X_L = X_C$ **(b)** $\omega = \frac{1}{\sqrt{LC}}$

(c) $f = \frac{1}{2\pi\sqrt{LC}}$ **(d)** All of above

76. Power factor is defined by:

(a) cos θ **(b)** sin θ

(c) tan θ **(d)** sec θ

77. At resonance frequency, the impedance of an R.L.C series circuit is:

(a) Minimum **(b)** Zero

(c) Maximum **(d)** None of these

78. At resonance frequency in an R.L.C series circuit, V_L and V_C:

(a) Greater than the source voltage **(b)** Smaller than the source voltage

(c) Equal to source voltage **(d)** None of these

79. A.C voltmeter measures:

(a) Peak value **(b)** Average voltage

(c) Peak inverse voltage **(d)** r.m.s voltage

80. The impedance of pure anti-resonant which at resonance is:

(a) 0 **(b)** $\frac{1}{2}$

(c) 1 **(d)** $\propto$

81. The positive value of current and voltage over a cycle is:

(a) Positive **(b)** Zero

(c) Negative **(d)** None of the above

82. A capacitor is a perfect insulator for:

(a) Direct current **(b)** Alternating current

(c) Both (a) and (b) **(d)** None of above

83. In comparison to D.C transmission losses in A.C are:

(a) Low **(b)** High

(c) Negligible **(d)** None of the above

84. In A.C circuits, the A.C instruments indicate:

(a) Peak values **(b)** Square of peak values

(c) Square root of peak values **(d)** Virtual values

85. When resistance is increased in a series LCR circuit:

(a) Impedance decreases **(b)** Reactance increases

(c) Phase angle increases **(d)** phase angle decreases

86. In an L.C.R, A.C circuit, the current becomes minimum when:

(a) $X_L > X_C$ **(b)** $X_L = X_C$

(c) $\sqrt{X_L X_C} = 1$ **(d)** $X_L < X_C$

87. The resonance frequency in case of series resonance circuit is given by:

(a) $f = \frac{1}{4\pi\sqrt{LC}}$ **(b)** $f = \frac{1}{2\pi\sqrt{L C}}$

(c) $f = \frac{1}{5\pi\sqrt{L C}}$ **(d)** None of the above

88. Which current can pass through a capacitor continuously:

(a) Direct current **(b)** Electronic current

(c) Alternating current **(d)** Both (a) and (b)

89. An inductor may store energy in its:

(a) Magnetic field **(b)** Electric field

(c) Coil **(d)** None of the above

90. The reactance of inductor depends upon:

(a) L **(b)** ωL

(c) ω **(d)** All of the above

91. A device that allows only the continuous flow of AC through a circuit is:

(a) Capacitor **(b)** Inductor

(c) Dynamo **(d)** D.C motor

92. A.C varies as function of:

(a) Time **(b)** Voltage

(c) Current **(d)** Displacement

93. In electromagnetic waves, the electric and magnetic fields are:

(a) Perpendicular **(b)** Parallel

(c) Antiparallal **(d)** At an angle of 45°

94. The impedance of a series circuit containing capacitance C, inductance L and resistance R is:

(a) $R + L - \frac{1}{C}$ **(b)** $\frac{1}{R} + L - C$

(c) $R + L + C$ **(d)** None of the above

95. The effective value of any sinusoidal alternating current or voltage is:

(a) $\sqrt{3}$ times its maximum value **(b)** $\frac{1}{\sqrt{2}}$ times its maximum value

(c) $\sqrt{2}$ times its maximum value **(d)** None of the above

96. In modulation, low frequency signal is known as:

(a) Loaded signal **(b)** Fluctuated signal

(c) Harmonic signal **(d)** Modulation signal

97. As a result of modulation, the resultant wave is known as:

(a) Energetic carriers wave **(b)** Carrier wave

(c) Modulated carrier wave **(d)** None of the above

98. The reactance X_C for a capacitor across an alternating source of frequency is:

(a) $X_c = \frac{f}{2\pi c}$ **(b)** $X_c = 2\pi fc$

(c) $X_c = \frac{fc}{2\pi}$ **(d)** $X_c = \frac{1}{2\pi fc}$

99. In A.C circuits, current and voltage is controlled by:

(a) Inductor L **(b)** Resistance R

(c) Capacitance C **(d)** All of the above

100. A pure inductive coil is that which has:

(a) No impedance **(b)** No ohmic resistance

(c) Some ohmic resistance **(d)** None of these

101. If X be the reactance, Z be impedance then in a series L.C.R circuit:

(a) $X^2 = (Z + R)^2$ **(b)** $X^2 = (Z - R)^2$

(c) $X^2 = Z^2 - R^2$ **(d)** $X^2 = Z^2 + R^2$

102. In a series L.C.R circuit, the total reactance of the circuit is:

(a) $(X_L - X_C)^2$ **(b)** $\sqrt{X^2_L - X^2_C}$

(c) $X_L + X_C$ **(d)** $\sqrt{(X_L - X_C)^2}$

103. Electrical resonance in an LCR A.C circuit is very sharp if:

(a) R is large **(b)** R is small

(c) $R = X_L$ or X_C **(d)** None of these

104. The instantaneous voltage across a pure inductance is:

(a) In phase with current **(b)** Lags the current by 90°

(c) Leads the current by 90° in phase **(d)** None of these

105. The process of combining low frequency signal with high frequency radio waves is called:

(a) Resonance **(b)** Fluctuation

(c) Modulation **(d)** Amplitude

106. For parallel resonant circuit, the resonance current is:

(a) Zero **(b)** Minimum

(c) Maximum **(d)** One

107. In L.C parallel circuit, the coil draws:

(a) Leading current **(b)** Lagging voltage

(c) Lagging current **(d)** Leading voltage

108. The reciprocal of impedance is called:

(a) Admittance **(b)** Capacitance

(c) Inductance **(d)** Resistance

109. The circuit in which current and voltage are in phase, the power factor is:

(a) Double **(b)** three times

(c) One **(d)** Zero

110. Capacity time constant is given by:

(a) $\frac{1}{RC}$ **(b)** R/C

(c) RC **(d)** $\frac{C}{R}$

111. In which of the following, the loss of energy is less:

(a) Alternating current **(b)** Direct current

(c) Photo electric current **(d)** None of the above

112. At high frequency, the current through a capacitor is:

(a) Small **(b)** Infinity

(c) Zero **(d)** Large

113. The reactance of 1 farad capacitance when connected to D.C circuit is:

(a) Infinite **(b)** One

(c) Zero **(d)** None of these

114. Pure choke consumes:

(a) Minimum power **(b)** Maximum power

(c) No power **(d)** Average power

115. Radio frequency choke is:

(a) Iron cored **(b)** Air Cored

(c) Air as well as iron cored **(d)** None of these

116. A choke is preferred to a capacitor to decrease the A.C in a circuit because the capacitor:

(a) Has power factor cos $\phi = 1$ **(b)** May not be a leak proof wattless resistance

(c) Leak proof wattless resistance **(d)** None of these

117. The peak value of alternating voltage is 423 volts, its rms value is:

(a) 300 volts **(b)** 423 volts

(c) 150 volts **(d)** 211.5 volts

118. The purpose of choke in a fluorescent lamp is:

(a) Increase the current **(b)** Decrease the current

(c) Decrease the voltage **(d)** Increase the voltage

119. The power dissipation in a pure inductive or capacitive circuit is:

(a) Zero **(b)** Maximum

(c) Opposite **(d)** Negative

120. As series resonance in L.C.R circuit, the impedance is equal to:

(a) Inductive reactance **(b)** Ohmic resistance

(c) Capacitive reactance **(d)** None of these

121. The frequency of an A.C may be associated by:

(a) $f = \frac{IV}{T}$ **(b)** $f = \frac{I}{T}$

(c) $f = \frac{1}{T}$ **(d)** None of these

122. The reactance of magnitude X_C of a capacitor joined across a alternating source can be found by a relation:

(a) $X_C = \frac{V_{rms}}{I_{rms}}$ **(b)** $X_C = V_{rms} + I_{rms}$

(c) $X_C = \frac{I_{rms}}{V_{rms}}$ **(d)** None of these

123. The magnitude of r.m.s value of voltage can be expressed as:

(a) $V_{rms} = \frac{V_o + V}{\sqrt{2}}$ **(b)** $V_{rms} = \frac{V_o}{\sqrt{2}}$

(c) $V_{rms} = \frac{V_o + V_o}{2}$ **(d)** None of these

124. Modulation is the process of:

(a) Combining low frequency signal with carrier

(b) Separating the low frequency signal from higher frequency radio wave

(c) Combing low frequency signal with high frequency radio waves

(d) Both (a) and (c)

125. For modulation purpose, high frequency radio waves are called:

(a) Carrier waves **(b)** Transverse waves

(c) Radio waves **(d)** Longitudinal waves

126. The low frequency signal used for modulation is called:

(a) Carrier signal **(b)** Radio signal

(c) Modulating signal **(d)** None of these

127. The amplitude modulation A.M transmission frequencies range from:

(a) 540 Hz to 1600 Hz **(b)** 540 Hz to 1500 MHz

(c) 540 KHz to 1600 KHz **(d)** None of these

128. In frequency modulation, the amplitude of carrier waves is:

(a) Increases **(b)** Remains constant

(c) Decreases **(d)** None of these

129. Modulation is achieved by changing the:

(a) Frequency and amplitude of the carrier waves

(b) Only frequency of the carrier wave

(c) Only amplitude of the carrier wave

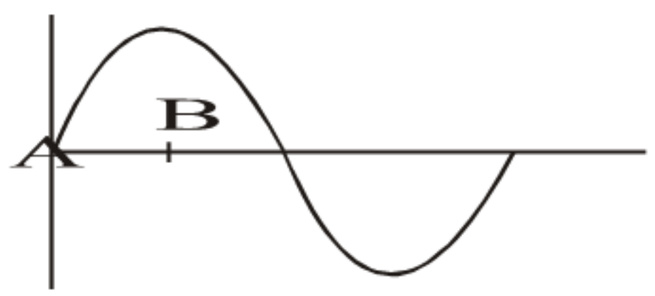
(d) None of these

130. If frequency of rotating coil of an A.C. generator is f Hz then frequency of e.m.f. produced is:

(a) 50 Hz **(b)** 60 Hz

(c) f Hz **(d)** None of these

131. In figure phase at B is:



(a) $\frac{\pi}{2}$ **(b)** π

(c) $\frac{3\pi}{2}$ **(d)** 2π

132. The basic circuit element in a D.C. circuit is:

(a) Capacitor **(b)** Transistor

(c) Resistor **(d)** Inductor

133. For q – t graph, slope shows:

(a) Current **(b)** Voltage

(c) e.m.f. **(d)** None of these

134. Slope of a horizontal line is:

(a) Zero **(b)** Infinite

(c) Maximum **(d)** None of these

135. For A.C. through a capacitor, current ———— voltage.

(a) Lags by $\frac{\pi}{2}$ **(b)** Leads by $\frac{\pi}{2}$

(c) $\tan^{-1}\frac{1}{\omega CR}$ **(d)** $\tan^{-1}\frac{\omega^2}{R}$

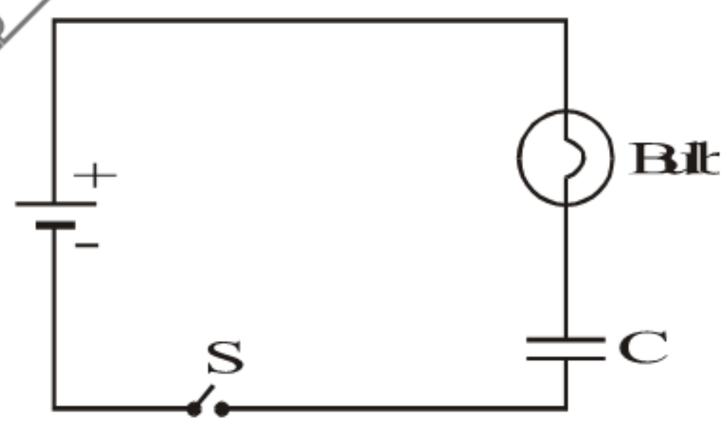
136. When switch S in closed bulb is:

(a) ON

(b) OFF

(c) Both (a), (b)

(d) None of these



137. When A.C. pass through an inductor, voltage leads the current by:

(a) Half cycle **(b)** Quarter cycle

(c) Full cycle **(d)** None of these

138. In case of inductor, in third quarter power is:

(a) Positive **(b)** Negative

(c) Both (a), (b) **(d)** None of these

139. Since an inductor does not consume energy coil is used for controlling A.C. Such a coil is called:

(a) Resistor **(b)** Choke

(c) Starter **(d)** None of these

140. When 10 V are applied to an A.C. circuit, the current flowing in it is 100 mA. Its impendence is:

(a) 100 Ω **(b)** 200 Ω

(c) 10 Ω **(d)** 300 Ω

141. In a R-C series circuit, current ———— applied voltage by θ =

(a) Lead, $\tan^{-1}\frac{1}{\omega CR}$ **(b)** Lead, $\frac{\pi}{2}$

(c) Lags, $\tan^{-1}\frac{1}{\omega CR}$ **(d)** Lags, $\frac{\pi}{2}$

142. In a R-L series circuit, current ———— applied voltage by θ =

(a) Lags, $\frac{\pi}{2}$ **(b)** Lags, $\tan^{-1}\frac{\omega L}{R}$

(c) Leads, $\tan^{-1}\frac{\omega L}{R}$ **(d)** None of these

143. Series resonance circuit is also called:

(a) R-L-C series circuit **(b)** Acceptor circuit

(c) Both (a), (b) **(d)** None of these

144. The resonance frequency is:

(a) $\frac{1}{2\pi\sqrt{2LC}}$ **(b)** $\frac{1}{4\pi\sqrt{LC}}$

(c) $\frac{0.0159}{\sqrt{LC}}$ **(d)** None of these

145. Parallel resonance circuit is also called:

(a) LC parallel **(b)** Tank

(c) Rejector **(d)** All of these

146. At resonance, impedance of parallel resonance circuit is ———— and it is equal to ————.

(a) Maximum, $\frac{L}{Cr}$ **(b)** Minimum, $\frac{L}{Cr}$

(c) Zero **(d)** None of these

147. For L-C parallel circuit, power factor is:

(a) Zero **(b)** One

(c) Two **(d)** Three

148. If capacitance of L-C parallel circuit is made four times then f = ————.

(a) Twice **(b)** Four times

(c) One fourth **(d)** One half

149. A 100 μF capacitor will offer a reactance of:

(a) 60 Ω **(b)** 90 Ω

(c) 32 Ω **(d)** 42 Ω

150. If a glass plate is placed between plates of a capacitor, in series with a lighted bulb, the brightness of the bulb.

(a) Remains same **(b)** Decreases

(c) Increases **(d)** Bulb turns off

151. Three phase supply also provides:

(a) 230 V **(b)** 460 V

(c) 400 V **(d)** None of these

152. The electromagnetic spectrum contains:

(a) Radio waves **(b)** X-rays

(c) Microwaves **(d)** All of these

153. Who proved that light waves are electromagnetic?

(a) Faraday **(b)** Einstein

(c) Maxwell **(d)** Enderson

154. Formula to prove speed of electromagnetic wave is equal to speed of light is:

(a) $V = \frac{S}{t}$ **(b)** $\frac{1}{\sqrt{\in_o \mu_o}}$

(c) $\sqrt{\frac{\in_o}{\mu_o}}$ **(d)** $\sqrt{\in_o \mu_o}$

155. Value of μ_o is:

(a) $4\pi \times 10^{-7}\ Hm^{-1}$ **(b)** $4\pi \times 10^{-7}\ wbA^{-1}m^{-1}$

(c) $4\pi \times 10^{-7}$ wb Am **(d)** Both (a), (c)

(e) Both (a), (b)

156. A capacitor of capacitance 30 μF is charged by a constant current of 10 mA. If initially capacitor is uncharged, what is time taken for potential difference across capacitor to reach 300 V?

(a) 0.9 sec. **(b)** 15 sec.

(c) 1.5×10^{-5} s **(d)** 0.9×10^{-3} s

ANSWERS

1.	(c)	**2.**	(b)	**3.**	(d)	**4.**	(c)	**5.**	(a)
6.	(d)	**7.**	(a)	**8.**	(b)	**9.**	(c)	**10.**	(a)
11.	(a)	**12.**	(c)	**13.**	(d)	**14.**	(b)	**15.**	(d)
16.	(d)	**17.**	(a)	**18.**	(d)	**19.**	(a)	**20.**	(a)
21.	(d)	**22.**	(b)	**23.**	(a)	**24.**	(a)	**25.**	(b)
26.	(a)	**27.**	(d)	**28.**	(b)	**29.**	(b)	**30.**	(b)
31.	(a)	**32.**	(b)	**33.**	(d)	**34.**	(d)	**35.**	(a)
36.	(b)	**37.**	(d)	**38.**	(a)	**39.**	(c)	**40.**	(a)
41.	(b)	**42.**	(a)	**43.**	(c)	**44.**	(a)	**45.**	(d)
46.	(a)	**47.**	(a)	**48.**	(a)	**49.**	(b)	**50.**	(a)
51.	(b)	**52.**	(d)	**53.**	(a)	**54.**	(a)	**55.**	(c)
56.	(b)	**57.**	(a)	**58.**	(a)	**59.**	(a)	**60.**	(a)
61.	(b)	**62.**	(a)	**63.**	(c)	**64.**	(d)	**65.**	(d)
66.	(c)	**67.**	(d)	**68.**	(d)	**69.**	(c)	**70.**	(c)
71.	(a)	**72.**	(b)	**73.**	(b)	**74.**	(a)	**75.**	(d)
76.	(a)	**77.**	(a)	**78.**	(b)	**79.**	(d)	**80.**	(d)
81.	(b)	**82.**	(a)	**83.**	(c)	**84.**	(d)	**85.**	(d)
86.	(b)	**87.**	(b)	**88.**	(c)	**89.**	(a)	**90.**	(b)
91.	(a)	**92.**	(a)	**93.**	(a)	**94.**	(d)	**95.**	(b)
96.	(d)	**97.**	(c)	**98.**	(d)	**99.**	(d)	**100.**	(b)
101.	(c)	**102.**	(d)	**103.**	(b)	**104.**	(c)	**105.**	(c)
106.	(b)	**107.**	(c)	**108.**	(a)	**109.**	(c)	**110.**	(a)
111.	(a)	**112.**	(d)	**113.**	(a)	**114.**	(c)	**115.**	(b)
116.	(b)	**117.**	(a)	**118.**	(b)	**119.**	(b)	**120.**	(b)
121.	(c)	**122.**	(a)	**123.**	(b)	**124.**	(d)	**125.**	(a)
126.	(c)	**127.**	(c)	**128.**	(b)	**129.**	(a)	**130.**	(c)
131.	(a)	**132.**	(c)	**133.**	(a)	**134.**	(a)	**135.**	(b)
136.	(b)	**137.**	(b)	**138.**	(a)	**139.**	(b)	**140.**	(a)
141.	(c)	**142.**	(c)	**143.**	(c)	**144.**	(c)	**145.**	(d)
146.	(a)	**147.**	(b)	**148.**	(d)	**149.**	(c)	**150.**	(b)
151.	(c)	**152.**	(d)	**153.**	(c)	**154.**	(b)	**155.**	(c)
156.	(a)								

PHYSICS OF SOLIDS

Each question has four possible answers, tick (✓) the correct answer:

1. Polymer solids are:

(a) Order solids **(b)** Disorder solids

(c) In b/w order and disorder **(d)** Neither type

2. Crystalline solids are:

(a) Order solid **(b)** Disorder solid

(c) In b/w order and disorder **(d)** All of above

3. Amorphous solids are:

(a) Order solid **(b)** Disorder solid

(c) In b/w order and disorder **(d)** None of the above

4. Amorphous solid are also called:

(a) Crystalline solid **(b)** Glassy solid

(c) Soft solid **(d)** Hard solid

5. Crystalline solid have:

(a) Definite melting point **(b)** Indefinite melting point

(c) In between **(d)** None of above

6. The solids are classified as:

(a) Polymeric **(b)** Amorphous

(c) Crystalline **(d)** All of above

7. Each atom in a crystalline vibrates about a fixed point with an amplitude that:

(a) Increases with rise in temperature **(b)** Decreases with rise in temperature

(c) Remains the same with rise in temperature **(d)** None of these

8. The transition from solid state to liquid state is actually from:

(a) Order to order **(b)** Disorder to order

(c) Order to disorder **(d)** None of these

9. The force which maintains the long-range order between atoms of crystalline solid is called:

(a) Gravitational force **(b)** Nuclear force

(c) Coulomb's force **(d)** Cohesive force

10. The word amorphous means:

(a) With definite structure **(b)** Without any structure

(c) Regular arrangement of atoms **(d)** None of these

11. An ordinary glass gradually softness into a paste like state before it becomes a very viscous liquid which is possible at:

(a) 900°C **(b)** 600°C

(c) 800°C **(d)** 100°C

12. A unit cell is the smallest basic structure which is:

(a) Two dimensional **(b)** One dimensional

(c) Three dimensional **(d)** None of these

13. The temperature at which the vibrations becomes so great that the structure of the crystal breaks is called:

(a) Melting point **(b)** Critical temperature

(c) Boiling point **(d)** None of these

14. The whole structure obtained by the repetition of unit cell is called:

(a) Crystalline solid **(b)** Amorphous solid

(c) Polymeric solid **(d)** Crystal lattice

15. Examples of polymeric solids are:

(a) Plastic **(b)** Zirconia

(c) NaCl **(d)** Copper

16. Examples of crystalline solids are:

(a) Copper **(b)** NaCl

(c) Zirconia **(d)** All of above

17. The substance which breaks after the elastic limit is called:

(a) Brittle **(b)** Organic

(c) Ductile **(d)** All of above

18. Ordinary glass becomes a very viscous liquid at:

(a) 600°C **(b)** 800°C

(c) 300°C **(d)** 100°C

19. Artificial polymers are made by a chemical reaction known as:

(a) Polymerization **(b)** Polarization

(c) Electroplating **(d)** All of the above

20. Which of the following are mechanical properties of a material:

(a) Ductility **(b)** Strength

(c) Stiffness **(d)** All of the above

21. The ratio of stress to strain is called:

(a) Modulus of elasticity **(b)** Young's modulus

(c) Bulk modulus **(d)** All of the above

22. The ratio of applied stress to tensile strain is called:

(a) Bulk modulus **(b)** Young modulus

(c) Shear modulus **(d)** None of the above

23. The ratio of the applied stress to volume strain is called:

(a) Bulk modulus **(b)** Young modulus

(c) Shear modulus **(d)** None of the above

24. The ratio of the applied stress to shear strain is called:

(a) Bulk modulus **(b)** Young modulus

(c) Shear modulus **(d)** None of the above

25. The prosperity of a material to return to its original shape and size on the removal of strain is called:

(a) Elasticity **(b)** Strain

(c) Plasticity **(d)** None of the above

26. When a body is subjected to some external force, deformation is produced in:

(a) Shape **(b)** Length

(c) Volume **(d)** Any of these

27. The results of mechanical tests are usually expressed in terms of:

(a) Strain **(b)** Stress

(c) Applied force **(d)** All of above

28. When the stress changes length of a body, it is called:

(a) Tensile strain **(b)** Shear strain

(c) Volumetric strain **(d)** None of these

29. When the stress changes the shape of the body it is called:

(a) Tensile strain **(b)** Shear strain

(c) Volumetric strain **(d)** None of these

30. When the stress changes the volume of the body, it is called:

(a) Tensile strain **(b)** Shear strain

(c) Volumetric strain **(d)** None of these

31. A stress which decreases the length along one dimension is known as:

(a) Compressive stress **(b)** Tensile stress

(c) Linear stress **(d)** None of these

32. Bulk Modulus is involved when the deformation is:

(a) Two dimensional **(b)** Three dimensional

(c) One dimensional **(d)** None of these

33. For practical purposes, the proportional limit for ductile material is:

(a) Smaller than elastic limit **(b)** Greater than elastic limit

(c) Identical to the elastic limit **(d)** None of these

34. When the specimen does not recover its original shape after the stress is removed, its behaviour is called:

(a) Ductility **(b)** Deformation

(c) Plasticity **(d)** Elasticity

35. Yield stress is another name of:

(a) Plasticity **(b)** Proportional limit

(c) Elastic limit **(d)** Both (b) and (c)

36. The ultimate tensile strength (UTS) is the:

(a) Maximum strength that a material can with stand

(b) Minimum strength

(c) Minimum strength that a material can withstand

(d) Both (a) and (c)

37. Once the stress is increased than UTS, the material falls into the region of:

(a) Fracture stress **(b)** Elastic limit

(c) Proportional limit **(d)** None of these

38. A steel wire 20 mm in diameter is stretched by a force of 113 N. The tensile stress applied is:

(a) 1 MPa **(b)** 10^{-6} N/m^2

(c) 0.1 MPa **(d)** 0.2×10^6 Pa

39. The area method for finding strain energy is useful for:

(a) Linear part **(b)** Non-elastic part

(c) Linear part of the force-extension graph **(d)** None of these

40. The strain energy in a deformed wire is actually the gain in the:

(a) Kinetic energy of its molecules **(b)** Potential energy of its molecules

(c) K.E and P.E of the its molecules **(d)** Gravitational P.E of its molecules

41. The force applied on a unit area to produce any change in shape, volume and length is called:

(a) Stress **(b)** Strain

(c) Elasticity **(d)** Plasticity

42. Hook's law states that the strain is directly proportional to:

(a) Power **(b)** Shear

(c) Force **(d)** Energy

43. Molecules of a solid possess:

(a) Rotatory motion **(b)** Vibratory motion

(c) Circular motion **(d)** Translatory motion

44. Force applied on a unit area is called:

(a) Strain **(b)** Stress

(c) Elasticity **(d)** Fracture strain

45. The SI unit of stress is:

(a) N-S **(b)** $N\text{-}m^{-2}$

(c) N-m **(d)** N

46. A stress which changes one dimension only is:

(a) Linear strain **(b)** Linear stress

(c) Elasticity **(d)** None of the above

47. The dimension of stress is:

(a) $[MLT^{-1}]$ **(b)** $[ML^{-1}T]$

(c) $[ML^{-1}T^{-1}]$ **(d)** $[ML^{-1}T^{-2}]$

48. The dimension of strain is:

(a) [L] **(b)** $[LT^{-1}]$

(c) $[L^{-1}]$ **(d)** Dimension less

49. The maximum stress which a body can bear is:

(a) Plastic stress **(b)** Elastic stress

(c) UTS **(d)** None of the above

50. Mathematically stress ca be expressed as:

(a) $E = \frac{F}{A}$ **(b)** $\sigma = \frac{F}{A}$

(c) $\gamma = \frac{\Delta a}{a}$ **(d)** None of the above

51. The extension produced in a sample of material depends upon:

(a) Area **(b)** Force

(c) Nature of material **(d)** All of the above

52. Mathematically the tensile strain can be expressed as:

(a) $\epsilon = \frac{\Delta l}{l}$ **(b)** $\sigma = F/A$

(c) $\gamma = \frac{\Delta a}{a}$ **(d)** None of the above

53. If ΔV be the change in volume and V is the original volume, the volume strain is given by:

(a) $\frac{\Delta V}{V}$ **(b)** $\frac{V}{\Delta V}$

(c) ΔV **(d)** None of the above

54. If Δl is the change in length and l is the original length then tensile strain can be expressed as:

(a) $\epsilon = l.\Delta l$ **(b)** $\epsilon = \frac{\Delta l}{l}$

(c) $\epsilon = \frac{l}{\Delta l}$ **(d)** None of these

55. A solid that is intermediate between order and disorder is called:

(a) Polymeric solids **(b)** Glassy solid

(c) Amorphous solids **(d)** None of these

56. Materials have specific uses depending upon their characteristics and properties such as:

(a) Hardness **(b)** Conducting or magnetic

(c) Ductility **(d)** All of above

57. Example of polymeric solid:

(a) Polythene **(b)** Plastic

(c) Nylon **(d)** All of above

58. Whole structure of solid obtain by the repetition of unit cells is called:

(a) Polymer **(b)** Crystal lattice

(c) Amorphous **(d)** None of these

59. Measure of deformation of body with application of stress is called:

(a) Rigidity **(b)** Modulus of elasticity

(c) Elasticity **(d)** Strain

60. Bulk modulus of elasticity is given by:

(a) $E = \dfrac{F/A}{\dfrac{\Delta l}{l}}$ **(b)** $K = \dfrac{F/A}{\dfrac{\Delta V}{V}}$

(c) $G = \dfrac{F/A}{\text{Tan}\,\theta}$ **(d)** F/A

61. Solids with high value of conduetivity are called:

(a) Conductors **(b)** Semi-conductors

(c) Insulators **(d)** Plasticity

62. Any change produced in shape, volume or length when a body is subjected some external force is called:

(a) Yield point **(b)** Elastic limit

(c) Deformation **(d)** Plasticity

63. Modulus of elasticity of material is:

(a) $\dfrac{\text{Stress}}{\text{Strain}}$ **(b)** $\dfrac{\text{Strain}}{\text{Stress}}$

(c) Stress × Strain **(d)** None of these

64. The value of stress beyond which the body is permanently deformed is called:

(a) Mini-stress **(b)** Yield stress

(c) Maxi-stress **(d)** None of these

65. The conductors having the conductivity of the order of:

(a) $10^{-4}\,(\Omega - m)^{-1}$ **(b)** $10^{7}\,(\Omega\,m)^{-1}$

(c) $10^{-10}\,(\Omega - m)^{-1}$ **(d)** $10^{-7}\,(\Omega - m)^{-1}$

66. Insulators have the conductivity of the order of:

(a) $10^{7}\ (\Omega\ m)^{-1}$ **(b)** $10^{-6}\ (\Omega\ m)^{-1}$

(c) $10^{-20}\ (\Omega\ m)^{-1}$ **(d)** $10^{-4}\ (\Omega\ m)^{-1}$

67. The substances which have partially filled conduction bands are called:

(a) Conductors **(b)** Insulator

(c) Semi-conductor **(d)** Super Conductor

68. A conduction band is always:

(a) Partially filled **(b)** Complete filled

(c) Partially empty **(d)** Empty

69. The conduction band lies:

(a) Inside the valance band **(b)** Below valance band

(c) Above valance band **(d)** None of these

70. The electrons occupying by conduction band are:

(a) Free electrons **(b)** Valance electrons

(c) Conductive electrons **(d)** All of above

71. The band below the valance band is:

(a) Empty band **(b)** Partially filled band

(c) Completely filled band **(d)** All of above

72. The theory failed to explain the complete electric behaviour of solid:

(a) Rutherford's theory **(b)** Newton's theory

(c) Bohr's theory **(d)** None of the above

73. The examples of conductors are:

(a) Copper **(b)** Diamond

(c) Wood **(d)** Germinium

74. The examples of insulators are:

(a) Diamond **(b)** Wood

(c) Zinc **(d)** Both (a) and (b)

75. Valence band:

(a) Contains valence electron **(b)** Contains no valence electron

(c) Highest occupied band **(d)** Lowest occupied band

76. Valence band may be:

(a) Completely filled **(b)** Partially filled

(c) Both (a) and (b) **(d)** None of these

77. Conduction band may be:

(a) Partially filled with electrons **(b)** Empty

(c) Not empty **(d)** None of these

78. Those materials in which valence and conduction bands are overlap each other are called:

(a) Conductors **(b)** Insulators

(c) Semi-conductors **(d)** None of these

79. Partially filled conduction and valence bands with a very narrow forbidden energy gap in between them shows the:

(a) Conductors **(b)** Insulators

(c) Semi-conductors **(d)** None of these

80. When a battery is connected to a semi-conductor, the current passes through it is due to:

(a) Electrons and holes **(b)** Protons and holes

(c) Electrons **(d)** Holes

81. On introducing a small amount of impurity into a pure semi-conductor, its electrical behaviour:

(a) does not change **(b)** is changed

(c) is changed very small **(d)** is changed very large

82. To form an N-type semi-conductor, silicon crystal is doped with:

(a) Penta valent element **(b)** Trivalent element

(c) Both (a) and (b) **(d)** None of these

83. An example of donor impurity is:

(a) Phosphorus **(b)** Indium

(c) Boron **(d)** Gallium

84. To form a P-type semi-conductor, silicon is doped with:

(a) Germanium **(b)** Arsenic

(c) Indium **(d)** Antimony

85. An example of acceptor impurity is:

(a) Phosphorus **(b)** Indium

(c) Arsenic **(d)** Silicon

86. An P-type substance is:

(a) Neutral **(b)** Positively charged

(c) Negatively charged **(d)** None of these

87. An N-type substance is:

(a) Neutral **(b)** Positively charged

(c) Negatively charged **(d)** None of these

88. Conductors have:

(a) Partially filled valance band **(b)** Partially filled conduction band

(c) Narrow forbidden gap **(d)** All of above

89. The doped semi-conducting materials are called:

(a) Superconductors **(b)** Poor semi conductors

(c) Pure semi conductors **(d)** Extrinsic semi conductors

90. When a Germinium is doped with pentavalent impurity, the doped semi conductor is:

(a) p-type **(b)** n-type

(c) Both (a) and (b) **(d)** None of the above

91. When a covalent bond is broken in a doped semi conductor:

(a) An electron is created **(b)** A proton and electron are created

(c) A hole is created **(d)** A pair of hole and electron are created

92. The material whose resistivity becomes zero below a certain temperature:

(a) Conductors **(b)** Semi conductors

(c) Super conductors **(d)** Insulators

93. The energy band occupying valance electrons is known as:

(a) Conductive electrons **(b)** Valance electrons

(c) Free electrons **(d)** Both (a) and (c)

94. The energy band occupying free electrons is called:

(a) Conduction band **(b)** Valance band

(c) Forbidden gap **(d)** None of these

95. An example of an intrinsic semi conductor is:

(a) Al **(b)** Ge

(c) Cb **(d)** Ph

96. An example of an extrinsic semi conductor is:

(a) Si **(b)** ph

(c) Al **(d)** Both (b) and (c)

97. The supper conductor was discovered by:

(a) Lenz **(b)** Orested

(c) Kmaerlingh ornes **(d)** Faraday

98. The first super conductor was discovered in:

(a) 1923 **(b)** 1917

(c) 1905 **(d)** 1911

99. The resistance of mercury becomes zero at the temperature:

(a) Below 4.2 K **(b)** to 4.2 K

(c) Above 4.2 K **(d)** None of these

100. A new class of ceramic materials was discovered in:

(a) 1986 **(b)** 1978

(c) 1938 **(d)** 1958

101. Lead becomes super conductor at temperature:

(a) 12.66 K **(b)** 7.2 K

(c) 3.0 K **(d)** 2.5 K

102. Super conductors are used in:

(a) Magnetic Levitation train **(b)** Fast computer chip

(c) Magnetic resonance imaging **(d)** All of the above

103. Semi conductor is one which has:

(a) Large conductivity **(b)** Less conductivity

(c) Zero conductivity **(d)** Intermediate conductivity

104. On doping, the conductivity of the semi conductor:

(a) Remains constant **(b)** Increases

(c) Decreases **(d)** None of the above

105. What type of impurity is to be added to the semi conductor material to provide hole:

(a) Pentavalent **(b)** Trivalent

(c) Monovalent **(d)** None of these

106. A p-type material is:

(a) Negatively charged **(b)** Positive charged

(c) Neutral **(d)** None of these

107. A metallic conductors conduct electricity because they have large number of free:

(a) Ions **(b)** Electrons

(c) Protons **(d)** Dipoles

108. A n-type material is:

(a) Negatively charged **(b)** Positively charged

(c) Both (a) and (b) **(d)** Neutral

109. Semi conductors have electrical conductivities which:

(a) Are high at ordinary temperature **(b)** Increase with temperature

(c) Decrease with temperature **(d)** None of these

110. A hole in p-type semi conductor is:

(a) Deficiency of electron **(b)** Excess of electron

(c) A missing proton **(d)** None of these

111. In a semi conductor, the mobility of holes is:

(a) Equal to electrons **(b)** Less than electrons

(c) Greater than electrons **(d)** None of these

112. In semi conductor, the holes and electrons move in:

(a) Opposite direction **(b)** Same direction

(c) Perpendicular to each other **(d)** None of these

113. A trivalent impurity is usually called:

(a) Donar **(b)** Accepter

(c) Transistor **(d)** Transformer

114. Recently a complex crystalline structure known as yttrium barium copper oxide ($Yba_2\ Cu_3\ O_3$) have reported to become super conductor at:

(a) 163 K **(b)** 169 K

(c) 200 K **(d)** 100 K

115. Substances whose atoms are magnetic dipole are called:

(a) Diamagnetic substance **(b)** Ferromagnetic substance

(c) Paramagnetic substance **(d)** All of these

116. An atom having resultant magnetic field:

(a) behaves like a tiny magnet **(b)** is called magnetic dipole

(c) is called diamagnetic **(d)** all of above

117. Magnetic field produced by spinning nucleus is:

(a) much weaker **(b)** is the same

(c) much stronger **(d)** none of these

118. The term domain refers mainly to:

(a) Paramagnetic substance **(b)** Diamagnetic substances

(c) Ferromagnetic substances **(d)** None of these

119. An electromagnet is the combination of solenoid and a specimen of:

(a) Steel inside it **(b)** Iron inside it

(c) Iron outside it **(d)** Wood inside it

120. Soft magnetic materials are used for making:

(a) Permanent magnets **(b)** Electromagnets

(c) Both (a) and (b) **(d)** None of these

121. Curie temperature is:

(a) Different for chromium oxide and cobalt **(b)** Same for chromium oxide and cobalt

(c) Same for iron and cobalt **(d)** None of these

122. Substances whose atoms do not form magnetic dipole are:

(a) Ferromagnetic **(b)** Paramagnetic

(c) Diamagnetic **(d)** All of these

123. Iron is a magnetic material:

(a) Soft **(b)** Hard

(c) Both (c) and (b) **(d)** None of these

124. The steel makes a good permanent magnet and is called:

(a) soft **(b)** hard

(c) in between **(d)** None of these

125. Ferromagnetic substance have the small regions are called:

(a) Magnets **(b)** Patches

(c) Domains **(d)** None of these

126. The curie temp for iron is about:

(a) 800°C **(b)** 740°C

(c) 750°C **(d)** 650°C

127. The process of introduces a small amount of impurity into the pure semi conductor is called:

(a) Overlapping **(b)** Mixing

(c) Doping **(d)** None of these

128. Which of the following are example of diamagnetic substances:

(a) Antimony **(b)** Cobalt

(c) Copper **(d)** Both (a) and (c)

129. Which of the following is not a ferromagnetic substances:

(a) Copper **(b)** Steel

(c) Iron **(d)** Cobalt

130. The permeability of diamagnetic materials:

(a) Less than one **(b)** Greater than one

(c) Equal to one **(d)** Zero

131. The temp at which a ferromagnetic disappear, the substance becomes paramagnetic is known as:

(a) Critical temperature **(b)** Curie temperature

(c) Absolute temperature **(d)** All of above

132. The area of hysteresis loop is proportional to the work done in:

(a) Magnetizing of the substance **(b)** Reversing the magnetic field

(c) Demagnetizing the substance **(d)** None of these

133. If a material sets up a magnetic field which opposes the applied magnetic field it is said to be:

(a) Electromagnetic **(b)** Diamagnetic

(c) Paramagnetic **(d)** None of these

134. The domain theory of magnet is important to explain the behaviour of:

(a) Diamagnets **(b)** Paramagnets

(c) Ferromagnets **(d)** All of these

135. A pentaralent impurity in Si:

(a) a free electron and a free hole **(b)** a free hole

(c) a free electron **(d)** No free particle

136. Unit of specific gravity:

(a) m/s^2 **(b)** No unit

(c) kg/m^3 **(d)** J/m^3

137. Unit of Bulk modulus is:

(a) No unit **(b)** N/m^2

(c) N/P_a **(d)** $P_a(m)$

138. Formula for strain energy in deformed materials is:

(a) $\frac{1}{2}\frac{EAl_1^2}{L}$ **(b)** $\frac{EAl_1^2}{2}$

(c) $\frac{1}{3}\frac{EAl_1}{L}$ **(d)** $\frac{1}{2}\frac{EAl_1}{L^2}$

139. At 0 K a piece of silicon is a:

(a) Conductor **(b)** Semi-conductor

(c) Insulator **(d)** All

140. Gallium belongs to ———— group.

(a) 4^{th} **(b)** 2^{nd}

(c) 7^{th} **(d)** 3^{rd}

141. Polythene, polystyrene and nylon etc., are examples of:

(a) Crystalline **(b)** Amorphous

(c) Polymers **(d)** None of these

142. Polymers have ———— specific gravity compared with even the lightest of metals.

(a) High **(b)** Low

(c) Zero **(d)** None of these

143. The strength to weight ratio of plastic material (chair) is ———— then steel material (chair).

(a) Greater **(b)** Lesser

(c) Same **(d)** None of these

144. There are ———— different crystal systems based as the geometrical arrangement of their atoms and the material breaks at a point, responding the ————.

(a) 2 **(b)** 7

(c) 3 **(d)** 5

145. Coercive force is used to:

(a) Demagnetize the material **(b)** Magnetize the material

(c) Extend it **(d)** None of these

146. Net charge on n-type material is:

(a) Positive **(b)** Negative

(c) Neutral **(d)** All

147. Energy needed to magnetize and demagnetize is given by:

(a) Hysteresis curve **(b)** Area of loop

(c) Coercivity **(d)** None of these

148. Yttrium bearium copper oxide ($YBa_2Cu_3O_7$) become superconductor at:

(a) 163 K **(b)** $-110°C$

(c) Both (a), (b) **(d)** None of these

149. Which of following has the highest elasticity?

(a) Rubber **(b)** Steel

(c) Glass **(d)** All

150. Which of the following has bulk modulus?

(a) Water **(b)** Gas

(c) Honey **(d)** All

151. The power dissipated in a resistor is the same for a constant potential difference V as for a sinusoidal potential difference with peak value V_0. Which of the following is the correct relationship between V and V_0?

(a) $V_0 = \frac{V}{2}$ **(b)** $V_0 = \frac{V}{\sqrt{2}}$

(c) $V_0 = V$ **(d)** $V_0 = \sqrt{2}V$

152. A sinusoidal alternating current of peak value I_0 passes through a heater of resistance R. What is the mean power output of the heater?

(a) $\frac{I_0^2 R}{2}$ **(b)** $\frac{I_0^2 R}{\sqrt{2}}$

(c) $I_0^2 R$ **(d)** $\sqrt{2}\, I_0^2 R$

153. An alternating current I/A varies with time t/s according to the equation.

$$I = 5\sin(100\pi t)$$

What is the mean power developed by the current in a resistive load of resistance 10Ω?

(a) 125W **(b)** 160W

(c) 250W **(d)** 500W

154. An alternating current of root-mean-square value 2A in a given resistor dissipates energy at the same rate as a steady direct current I in another resistor of the same value. What is the value of I?

(a) $\sqrt{2}$ A **(b)** 2A

(c) $2\sqrt{2}$ A **(d)** 4A

ANSWERS									
1.	(c)	**2.**	(a)	**3.**	(b)	**4.**	(b)	**5.**	(a)
6.	(d)	**7.**	(a)	**8.**	(c)	**9.**	(d)	**10.**	(b)
11.	(c)	**12.**	(c)	**13.**	(a)	**14.**	(d)	**15.**	(a)
16.	(d)	**17.**	(a)	**18.**	(b)	**19.**	(a)	**20.**	(d)
21.	(a)	**22.**	(b)	**23.**	(a)	**24.**	(c)	**25.**	(a)
26.	(d)	**27.**	(d)	**28.**	(a)	**29.**	(b)	**30.**	(c)
31.	(c)	**32.**	(b)	**33.**	(c)	**34.**	(c)	**35.**	(c)
36.	(a)	**37.**	(a)	**38.**	(a)	**39.**	(c)	**40.**	(b)
41.	(a)	**42.**	(c)	**43.**	(b)	**44.**	(b)	**45.**	(b)
46.	(b)	**47.**	(d)	**48.**	(d)	**49.**	(c)	**50.**	(b)
51.	(d)	**52.**	(a)	**53.**	(a)	**54.**	(b)	**55.**	(a)
56.	(d)	**57.**	(d)	**58.**	(b)	**59.**	(d)	**60.**	(b)
61.	(a)	**62.**	(c)	**63.**	(a)	**64.**	(b)	**65.**	(b)
66.	(c)	**67.**	(a)	**68.**	(a)	**69.**	(c)	**70.**	(d)
71.	(c)	**72.**	(c)	**73.**	(a)	**74.**	(d)	**75.**	(a)
76.	(c)	**77.**	(a)	**78.**	(a)	**79.**	(c)	**80.**	(a)
81.	(b)	**82.**	(a)	**83.**	(a)	**84.**	(c)	**85.**	(b)
86.	(a)	**87.**	(a)	**88.**	(d)	**89.**	(d)	**90.**	(b)
91.	(d)	**92.**	(c)	**93.**	(d)	**94.**	(b)	**95.**	(b)
96.	(d)	**97.**	(c)	**98.**	(d)	**99.**	(a)	**100.**	(a)
101.	(b)	**102.**	(d)	**103.**	(d)	**104.**	(b)	**105.**	(b)
106.	(c)	**107.**	(b)	**108.**	(d)	**109.**	(b)	**110.**	(a)
111.	(b)	**112.**	(a)	**113.**	(b)	**114.**	(a)	**115.**	(c)
116.	(d)	**117.**	(a)	**118.**	(c)	**119.**	(b)	**120.**	(c)
121.	(a)	**122.**	(c)	**123.**	(a)	**124.**	(b)	**125.**	(c)
126.	(c)	**127.**	(c)	**128.**	(d)	**129.**	(a)	**130.**	(a)
131.	(b)	**132.**	(d)	**133.**	(b)	**134.**	(c)	**135.**	(c)
136.	(b)	**137.**	(b)	**138.**	(a)	**139.**	(b)	**140.**	(d)
141.	(c)	**142.**	(b)	**143.**	(a)	**144.**	(b)	**145.**	(a)
146.	(c)	**147.**	(b)	**148.**	(c)	**149.**	(b)	**150.**	(b)
151.	(d)	**152.**	(a)	**153.**	(a)	**154.**	(c)		

ELECTRONICS

Each question has four possible answers, tick (✓) the correct answer:

1. Temperature coefficient of resistivity of a semi conductor is:

(a) Constant **(b)** Positive

(c) Negative **(d)** Variable

2. The pn junction on forward baising acts as:

(a) Capacitor **(b)** Low resistor

(c) Inductor **(d)** High resistor

3. Which one of the following is not semi conductor:

(a) Silicon **(b)** Copper

(c) Gallium arsenide **(d)** Germinium

4. The average gap for Germanium at 0K is:

(a) 1.12 ev **(b)** 0.02 ev

(c) 6.72 ev **(d)** 7.2 ev

5. The process of doping causes the resistivity of semi conductor to:

(a) Decrease **(b)** Remains constant

(c) Increase **(d)** None of these

6. Depletion region has:

(a) Electrons only **(b)** Holes only

(c) Both electrons and holes **(d)** Neither holes nor electrons

7. An n-type substance is:

(a) Electrically neutral **(b)** Negatively charged

(c) Positively charged **(d)** None of these

8. Holes are exist in:

(a) Conductors **(b)** Semi conductors

(c) Insulators **(d)** All of the above

9. A pn junction cannot be used as:

(a) A detector **(b)** A rectifier

(c) An amplifier **(d)** None of these

10. Hole is equivalent to:

(a) A positive charge **(b)** A negative charge

(c) A neutral **(d)** None of these

11. There is no current due to holes in good electrical conductors because they have:

(a) Large forbidden energy gap **(b)** No valance electron

(c) Overlapping valance & conduction band **(d)** None of these

12. Silicon is the most commonly used:

(a) Insulator **(b)** Semi-conductor

(c) Dielectric **(d)** Conductor

13. The crystal of Germinium or silicon in its pure form at absolute zero acts as:

(a) Insulater **(b)** Conductor

(c) Semi-conductor **(d)** None of these

14. The crystal of germinium or silicon in its pure form at room temperature acts as:

(a) Insulator **(b)** Conductor

(c) Semi-conductor **(d)** None of these

15. All the valence electrons present in a crystal of silicon are bounded in their orbits by:

(a) Covalent bond **(b)** Ionic bond

(c) Molecular bond **(d)** None of these

16. Majority charge carries in the P-type region of p-n-junction are:

(a) Protons **(b)** Electrons

(c) Positrons **(d)** Holes

17. The impurity in the germinium is usually in the ratio of:

(a) $1:10^6$ **(b)** $1:10^4$

(c) $1:10^8$ **(d)** $1:10^{10}$

18. A potential barrier of 0.7V exists across p-n junction made from:

(a) Silicon **(b)** Germinium

(c) Indium **(d)** Gallium

19. A Potential difference is developed across the depletion region of p-n junction due to:

(a) Negative ions **(b)** Positive ions

(c) Both positive and negative ions **(d)** None of these

20. The external potential difference applied to p-n junction for forward biasing supplied energy to:

(a) Free electrons in n region **(b)** Holes in p-region

(c) Both free electrons and holes **(d)** None of these

21. In forward biased situation, as the biasing voltage is increased, the current:

(a) Does not change **(b)** Decreases

(c) Also increases **(d)** None of these

22. While drawing a graph between current and biasing voltage in p-n junction, the current is taken:

(a) Along x-axis **(b)** Along –y-axis

(c) Along x-axis and in mA **(d)** Along +y-axis

23. In reverse biased, the resistance offered by the p-n junction is of the order of:

(a) A few MΩ **(b)** Several MΩ

(c) A few ohms **(d)** None of these

24. The semi conductor diode has the property of:

(a) Two way conduction **(b)** Zero conduction

(c) One way conduction **(d)** Amplification

25. Electrons present in P-type material due to thermal pair generation are:

(a) Majority carriers **(b)** Minority carriers

(c) Dual carriers **(d)** None of these

26. Semi conductors with donor atoms and free electrons belong to the type:

(a) n **(b)** P

(c) Both n and P **(d)** Any of above

27. P-n junction when reversed biased acts as a:

(a) Capacitor **(b)** Inductor

(c) On switch **(d)** Off switch

28. In an n-type semi conductor there are:

(a) Holes as majority carrier **(b)** Immobile positive ions

(c) Immobile negative ions **(d)** None of these

29. The width of depletion region of a junction:

(a) Increase with inverse biasing **(b)** Decrease with light doping

(c) Increase with heavy doping **(d)** None of these

30. Which one of the following has the greatest energy gap:

(a) Conductor **(b)** Semi conductor

(c) Insulator **(d)** None of these

31. Which one of the following has smallest energy gap:

(a) Conductors **(b)** Semi conductors

(c) Insulators **(d)** None of these

32. Minority carries in n-type substances are:

(a) Protons **(b)** Electrons

(c) Neutrons **(d)** Holes

33. Minority carriers in a p-type substances are:

(a) Protons **(b)** electrons

(c) Neutrons **(d)** Holes

34. A junction between p and n materials forms:

(a) An amplifier **(b)** An oscillator

(c) A detector **(d)** A semi conductor diode

35. Semi conductor diode conducts only when it is:

(a) Reverse biased **(b)** Forward biased

(c) Not biased **(d)** None of these

36. The forward current through a semi conductor diode circuit is due to:

(a) Electrons **(b)** Holes

(c) Majority carriers **(d)** Minority carriers

37. The reverse current through a semi conductor diode is due to:

(a) Electrons **(b)** Holes

(c) Majority carriers **(d)** Minority carriers

38. In pn junction, p-type end is basically referred as:

(a) Anode **(b)** Cathode

(c) Neutral **(d)** None of these

39. In half wave rectification, the output DC voltage is obtained across the load for:

(a) The negative half cycle of input AC **(b)** The positive half cycle of input AC

(c) Both the input of AC **(d)** None of the above

40. In full wave rectification, the output DC voltage is obtained across the load for:

(a) The positive half cycle of input AC **(b)** The negative half cycle of input AC

(c) Complete cycle of input AC **(d)** None of these

41. Forward resistance of p-n junction is:

(a) Few ohms **(b)** Mega ohms

(c) Infinity **(d)** Kilo ohms

42. Reverse resistance of p-n junction is:

(a) Low **(b)** Zero

(c) Very high **(d)** None of these

43. Conversion of alternating current into direct current is called:

(a) Modulation **(b)** Amplification

(c) Oscillation **(d)** Rectification

44. A region having zero charge particle:

(a) Depletion region **(b)** Potential difference

(c) Curved region **(d)** None of above

45. The potential difference across depletion region in case of Si is:

(a) 0.6 volt **(b)** 0.9 volt

(c) 0.7 volt **(d)** 0.2 volt

46. The potential difference across depletion region in case of Ge is:

(a) 0.3 volt **(b)** 0.7 volt

(c) 0.6 volt **(d)** 0.8 volt

47. The most commonly used diode for special purpose is:

(a) Light emitting diode **(b)** Photo diode

(c) Photo voltaic cell **(d)** All of above

48. A light emitting diode is made from:

(a) Germinium **(b)** Silicon

(c) Gallium arsenide **(d)** Phosphorus

49. The number of LEDs required to display all the digits is:

(a) Seven **(b)** Five

(c) Six **(d)** Eight

50. A photo diode can be used:

(a) For detection of visible light **(b)** For detection of invisible light

(c) Both (a) and (b) **(d)** As an inductor

51. The diode used for the detection of visible and in visible light is:

(a) Photodiode **(b)** Photo voltaic cell

(c) Light emitting **(d)** All of above

52. A diode, which can turn current ON and OFF in nanosecond is called:

(a) Photo voltaic cell **(b)** Light emitting diode

(c) Photodiode **(d)** None of these

53. Photodiode is operated:

(a) In the reversed biased situation **(b)** In the forward biased situation

(c) With the light incident upon it **(d)** Both (a) and (c)

54. Photo voltaic cell is also called:

(a) Solar cell **(b)** Generator

(c) Thermo couple **(d)** Thermister

55. A single photovoltaic cell produces a current of:

(a) 0.9v **(b)** 0.6v

(c) 0.5v **(d)** 6.0v

56. A single photo voltaic cell produces a current of:

(a) A few mA **(b)** A few μ A

(c) A few ampere **(d)** 1A

57. The light emitting diode emits light when it is:

(a) Reverse biased **(b)** Forward biased

(c) Both (a) and (b) **(d)** None of these

58. The specially designed semi conductor diodes used as indicator lamps in electronic circuits are:

(a) The switch **(b)** The light emitting diode

(c) The photo diode **(d)** Solar cells

59. The specially designed semi-conductor used for as fast countings in electronic circuits is:

(a) Photo diodes **(b)** Light emitting diode

(c) Photo voltaic cell **(d)** Solar cell

60. A combination of p-type and N-type substance give rise to:

(a) P-N junction **(b)** N-N-junction

(c) P-P junction **(d)** None of the above

61. When p-type of p-n-junction connected to positive end and N-type of the junction connected to the negative terminal of battery then the junction is:

(a) Reverse biased **(b)** Forward biased

(c) Neutral **(d)** None of these

62. If a reverse current of a reverse biased junction is increased to a maximum value then:

(a) Diode junction may break down **(b)** Voltage drops to zero

(c) Voltage becomes maximum **(d)** None of these

63. The forward resistance of the p-n-junction is expressed as:

(a) $r_f = \Delta v_f \times \Delta I_f$ **(b)** $r_f = \Delta v_f - \Delta I_f$

(c) $r_f = \frac{\Delta v_f}{\Delta I_f}$ **(d)** $r_f = \frac{\Delta I_f}{\Delta V_f}$

64. The semi conductor diode has the property of a:

(a) Two way conduction **(b)** One way conduction

(c) Zero conduction **(d)** None of these

65. If positive terminal of the battery is connected to n-type and negative terminal is connected to p-type then diode is:

(a) Forward biased **(b)** Reverse biased

(c) Zero biased **(d)** Not biased

66. The process due to which current flows only during alternate half cycle is known as:

(a) Half wave rectification **(b)** Full wave rectification

(c) Saturation **(d)** Amplification

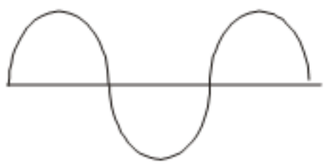
67. The circuit of full wave rectification consist of:

(a) Three diodes **(b)** Four diodes

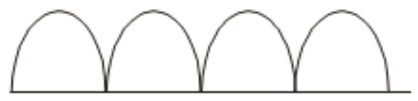
(c) Two diodes **(d)** One diode

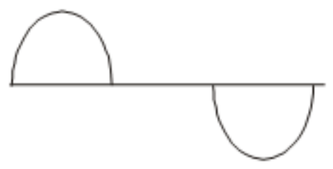
68. The wave form of an a.c voltage is:

(a)  **(b)** 

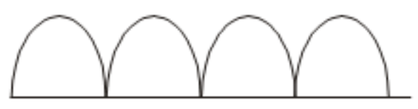
(c)  **(d)**

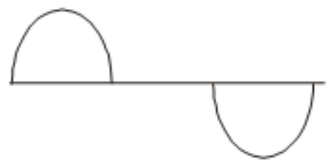
69. Which of the following diagram represents the wave form of an a.c voltage after full wave rectification:

(a)  **(b)** 

(c)  **(d)** 

70. Which of the following diagram represents the wave form of a.c voltage after half wave rectification:

(a)  **(b)** 

(c) **(d)** 

71. Transistor was discovered by:

(a) John Bardeen **(b)** I-carrie

(c) G Bell **(d)** Young

72. A transistor has:

(a) Two region **(b)** One region

(c) Three region **(d)** Four region

73. In a certain circuit, $I_B = 40\ \mu A$, $I_C = 20$ mA:

(a) 450 amp **(b)** 0.45 amp

(c) 5 m amp **(d)** 500 amp

74. The basic condition for a transistor amplifier circuit is:

(a) The base-emitter junction should be forward biased

(b) The base-emitter junction should be reverse biased

(c) The base-collector junction should be forward biased

(d) None of these

75. Usually V_{BB} is:

(a) Larger than V_{CC} **(b)** Smaller than V_{CC}

(c) Equal to V_{CC} **(d)** None of these

76. In order that a transistor acts as switch, a larger positive potential is applied across its:

(a) Base-collector terminals **(b)** Base emitter terminals

(c) Collector emitter terminals **(d)** None of these

77. To turn the transistor OFF, the base current is set:

(a) At zero value **(b)** At maximum value

(c) At minimum value **(d)** None of these

78. Types of transistors are:

(a) Seven **(b)** Two

(c) Four **(d)** Three

79. In the transistor schematic symbol, the arrow is:

(a) Located on the base **(b)** Located on the collector

(c) Located on the emitter **(d)** None of these

80. The term transistor stands for:

(a) Transfer of resistance **(b)** Transfer of current

(c) Transfer of charge **(d)** Transfer of energy

81. The transistor in a circuit basically acts as:

(a) Power amplifier **(b)** Current amplifier

(c) Voltage amplifier **(d)** None of these

82. Transistor can be used as:

(a) Oscillator **(b)** Switches

(c) Units **(d)** All of above

83. When a transistor is used in a circuit generally:

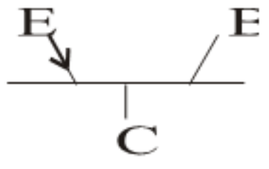
(a) The collector-base junction is forward biased and the collector-base junction is reverse biased

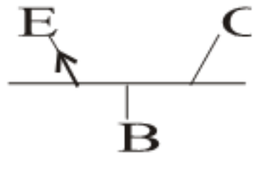
(b) Both the junctions are forward biased

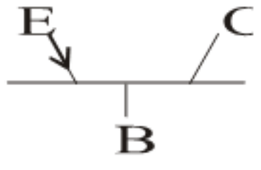
(c) Both the junction are reverse biased

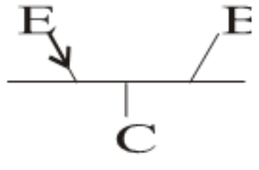
(d) None of these

84. The symbol of p-n-p transistor is:

(a) 

(b) 

(c) 

(d) 

85. The characteristic of transistor are:

(a) Temperature dependent **(b)** Sound dependent

(c) Energy dependent **(d)** Light dependent

86. Emitter base junction is always:

(a) Forward biased **(b)** Reverse biased

(c) Both forward and reverse **(d)** None of these

87. The emitter and base has concentration of impurity:

(a) Less **(b)** Zero

(c) Greater **(d)** None of these

88. Identify which device used the rectification:

(a) Inductor **(b)** Capacitor

(c) Transistor **(d)** P-n junction

89. Which one of the following device based on p-n junction:

(a) Photo diode **(b)** Light emitting diode

(c) Photo voltaic cell **(d)** All of the above

90. Light emitting diode based on:

(a) Emission of energy in the form of photons

(b) Faradays law

(c) Ionic bonding between p-type and n-type substances

(d) None of these

91. Photo diode can be used as:

(a) A automatic ON and OFF switch **(b)** Direction of light

(c) Logic gates **(d)** All of above

92. The central region of n-p-n transistor is known as:

(a) Base **(b)** Collector

(c) Emitter **(d)** None of above

93. In general, most of the electrical circuits make use of:

(a) n-n junction **(b)** p-p junction

(c) n-p-n transistor **(d)** p-n-p transistor

94. For normal transistor the emitter current can be given by:

(a) $I_E = I_C$ **(b)** $I_E = I_C + I_B$

(c) $I_E = I_B$ **(d)** None of these

95. When light emitting diode is forward biased, it emits light of colour:

(a) Yellow **(b)** Green

(c) Red **(d)** All of the above

96. The advantage of LEDs is:

(a) High operating speed **(b)** Small size

(c) Reliability **(d)** All

97. In n-p-n transistor, the current flows in the direction from:

(a) Base to emitter **(b)** Collector to emitter

(c) Emitter to base **(d)** Base to collector

98. In p-n-p transistor, the current flows in the direction from:

(a) Base to emitter **(b)** Emitter to collector

(c) Emitter to base **(d)** Base to collector

99. In a transistor which one is very thin:

(a) Base **(b)** Collector

(c) Emitter **(d)** None of these

100. The thickness of the base is of the order of:

(a) 10^{-6} m **(b)** 10^{-4} m

(c) 10^{-2} m **(d)** 10^{4} m

101. A transistor consists of three electrical contact which one of these is rectifying:

(a) Collector **(b)** Base

(c) Emitter **(d)** Both (a) and (c)

102. An expression for current gain of a transistor is given by:

(a) $\beta = \frac{I_B}{I_C}$ **(b)** $\beta = I_C + I_B$

(c) $\beta = I_C - I_B$ **(d)** $\beta = \frac{I_B}{I_C}$

103. When transistor works as an amplifier, its output is:

(a) Zero **(b)** Greater

(c) Less **(d)** Greater or less directly proportional to the input

104. An operational amplifier can be used as:

(a) Night switch **(b)** Comparator

(c) Inverting and non-inverting amplifier **(d)** All of the above

105. An operational amplifier have how many input terminals:

(a) Two **(b)** Four

(c) Three **(d)** Five

106. An operational amplifier will act as inverting amplifier, when the input signal is connected to:

(a) Earthed wire **(b)** Inverting terminal

(c) Non inverting terminal **(d)** None of these

107. The operational-amplifier is so called because it was some times used to perform mathematical operations:

(a) Chemically **(b)** Electronically

(c) Electrically **(d)** Mechanically

108. An op-amp has input terminals namely:

(a) Inverting (–) input **(b)** Non-inventing C+D

(c) Both (a) and (b) **(d)** None of these

109. The resistance between (+) and (–) inputs of an op-amp is of the order of:

(a) Several mega ohms **(b)** A few ohms

(c) Both (a) and (b) **(d)** None of these

110. To use an op-amp as an inverting amplifier, the terminal which is grounded is the:

(a) Inverting terminal **(b)** Non-inverting terminal

(c) Out put terminal **(d)** None of these

111. In case of op-amp as an inverting amplifier, $V_+ - V_- = 0$, this is because:

(a) Open gain loop is very low **(b)** Closed loop gain is very high

(c) Open loop gain is very high **(d)** Both (a) and (a)

112. In order to use the op-amp as non-inverting amplifier, the input signal is applied as:

(a) Non-inverting (+) terminal **(b)** Inverting (–) terminal

(c) Inverting (+) terminal **(d)** All of above

113. If $R_1 = 10\ k\Omega$, $R_2 = 100\ k\Omega$, the gain of the op-amp acting as inverting amplifier comes out to be:

(a) +10 **(b)** –10

(c) +0.1 **(d)** –0.1

114. The open loop gain of an op-amplifier is of the order of:

(a) 10^3 **(b)** 10^4

(c) 10^6 **(d)** 10^5

115. The number of input terminals of an op-amplifier is:

(a) Four **(b)** Two

(c) Three **(d)** One

116. Operational-amplifier has been discussed as comparator of:

(a) Voltage **(b)** Current

(c) Displacement **(d)** Electric fields

117. The operational amplifier is:

(a) A high gain amplifier **(b)** A high-power amplifier

(c) A high resistance amplifier **(d)** A low resistance amplifier

118. An op-amplifier can apply to:

(a) A.C only **(b)** D.C only

(c) Both A.C and D.C **(d)** None of these

119. Non-inverting amplifier circuit have:

(a) A very low input impedance **(b)** A very high input impedance

(c) A low output impedance **(d)** None of these

120. An expression for gain of an inverting amplifier is:

(a) $-\frac{R_2}{R_1}$ **(b)** $\frac{R_1}{R_2}$

(c) $(R_1\ R_2)$ **(d)** None of these

121. The value of open loop gain value for the amplifier is:

(a) Zero **(b)** Infinity

(c) Very high **(d)** Very low

122. An expression for gain of non-inverting amplifier is:

(a) $G = 1 + \frac{R_2}{R_1}$ **(b)** $G = 1 + \frac{R_1}{R_2}$

(c) $G = 1 - \frac{R_1}{R_2}$ **(d)** $G = 1 + R_1\ R_2$

123. A system which deals with quantities or variables which have only two discrete values or states is known as:

(a) Binary system **(b)** Logic gate

(c) Number system **(d)** Digital system

124. In describing functions of digital system, a lighted bulb will be described as:

(a) Infinity **(b)** 1

(c) 0 **(d)** None of these

125. Which of the following is basic operation of Boolean algebra:

(a) AND operation **(b)** NOT operation

(c) OR operation **(d)** All of these

126. A circuit which has two or more input signals that delivers an output when any one or more input signals are energetic is known as:

(a) AND gate **(b)** OR gate

(c) NOT gate **(d)** NOR gate

127. A circuit which has two or more input signals and which delivers an output only when every input signal is energetic is known as:

(a) OR gate **(b)** NOT gate

(c) AND gate **(d)** NOR gate

128. The logic circuit with one input and one output that inverts the input signal at the output is known as:

(a) OR gate **(b)** NOT gate

(c) AND gate **(d)** NOR gate

129. The mathematical symbol for OR operation:

(a) $X = A.B$ **(b)** $X = \overline{A \,.\, B}$

(c) $X = A + B$ **(d)** $X = \overline{A + B}$

130. The mathematical symbol for AND gate is:

(a) $X = \overline{A + B}$ **(b)** $X = A.B$

(c) $X = A + B$ **(d)** $X = \overline{A \,.\, B}$

131. The mathematical symbol for NOR operation is:

(a) $X = \overline{A + B}$ **(b)** $X = A.B$

(c) $X = A + D$ **(d)** $X = \overline{A \,.\, B}$

132. The mathematical symbol for NAND operation is:

(a) $X = A + B$ **(b)** $X = \overline{A} \,.\, \overline{B}$

(c) $X = \overline{A \,.\, B}$ **(d)** $X = \overline{A + B}$

133. The logic gats are used in:

(a) Pocket calculators **(b)** Robots

(c) Digital watches **(d)** All of these

134. In describing functions of digital system, 0 represents:

(a) OFF **(b)** True

(c) ON **(d)** Lighted

135. In describing function of digital system, 1 represents:

(a) True statement **(b)** Closed switch

(c) Lighted bulb **(d)** All of above

136. The values 1 and 0 are designated as:

(a) Binary values **(b)** Continuous values

(c) Decimal values **(d)** None of these

137. The gate will recognized the voltage as high or 1 if the voltage applied to the gate is:

(a) 1.5 volt **(b)** 3.5 volt

(c) 0.5 volt **(d)** 0.7 volt

138. The gate will recognize the voltage as 1 or 0 if the voltage applied to the gate is:

(a) 3.5 volt **(b)** 0.5 volt

(c) 5.5 volt **(d)** 7.5 volt

139. In OR gate, the output is 1 if:

(a) At least one input is 1 **(b)** Both input are 1

(c) Both inputs are 0 **(d)** None of these

140. In AND gate, the output is 0 if:

(a) Both inputs are 1 **(b)** Both inputs are 0

(c) One input is Zero **(d)** None of these

141. In AND gate, the output is 1 if:

(a) Both inputs are 1 **(b)** Both inputs are 0

(c) One input is 0 **(d)** None of these

142. The gate, which performs the operation of inversion is called:

(a) NOT gate **(b)** AND gate

(c) OR gate **(d)** XOR gate

143. The gate, which changes the logic level to its opposite level is called:

(a) NOR gate **(b)** AND gate

(c) OR gate **(d)** NOT gate

144. If both the inputs given to a gate are 1, such that the output is 0 then it is:

(a) NAND gate **(b)** NOR gate

(c) XOR gate **(d)** All of these

145. If both the inputs given to a gate are 0 such that the output is 1 then it is:

(a) NAND gate **(b)** NOR gate

(c) XN, OR gate **(d)** All of these

146. XOR gate can be made by combining:

(a) NOR, AND, NOT gates **(b)** OR, AND, NOT gates

(c) OR, NAND, NOT gates **(d)** OR, NOR, NOT gates

147. XNOR gate can be made by combining:

(a) OR, NOR, NOT gate **(b)** OR, AND, NO gates

(c) OR, NAND, NOT gates **(d)** NOR, AND, NOT gates

148. At higher temperature, potential barrier voltage:

(a) Decreases **(b)** Increases

(c) No change **(d)** None

149. Width of depletion region is:

(a) 10^{-8} m **(b)** 10^{-7} m

(c) 10^{-6} m **(d)** 10^{-4} m

150. The barrier voltage is more for silicon because of its ———— atomic number allows more stability in covalent bonds.

(a) High **(b)** Low

(c) Both (a), (b) **(d)** None

151. Breakdown voltage is:

(a) 25 V **(b)** 15 V

(c) 35 V **(d)** 5 V

152. The value of reverse current for Ge is:

(a) 1 μA **(b)** 1 mA

(c) 1 A **(d)** 1 MA

153. Device used for conversion of D.C. to A.C. is:

(a) Oscillator **(b)** Rectifier

(c) Amplifier **(d)** None

154. p-n junction when reversed biased acts as a:

(a) Capacitor **(b)** On switch

(c) Off switch **(d)** None

155. Pulsating D.C. can be made smooth by using a circuit known as:

(a) Filter **(b)** Tank

(c) Accepter **(d)** All

156. A photodiode can switch its current on OR off in:

(a) nano second **(b)** milli second

(c) micro second **(d)** centi second

157. Photodiode is used in:

(a) Automatic switch **(b)** Optical communication equipment

(c) Light meters **(d)** All

158. Silicon transistors are preferred because:

(a) High operating temperature **(b)** Low leakage current

(c) Suited to high frequency circuits **(d)** All

159. Current gain of a transistor which has collector current of 10 mA and a base current of 40 μA is:

(a) 25 **(b)** 250

(c) 2500 **(d)** 25000

160. In case of common emitter amplifier, phase difference between input and out:

(a) 0° **(b)** 120°

(c) 180° **(d)** 90°

161. When transistor acts as OFF switch then voltage across collector and emitter is ———— V_{CC}.

(a) Less than **(b)** Greater than

(c) Equal to **(d)** None

162. LDR is a:

(a) Conductor **(b)** Semiconductor

(c) Insulator **(d)** None

163. During day time, when light is falling upon LDR, R_L is:

(a) Large **(b)** Unchanged

(c) Small **(d)** None

164. The photovoltaic cell is always:

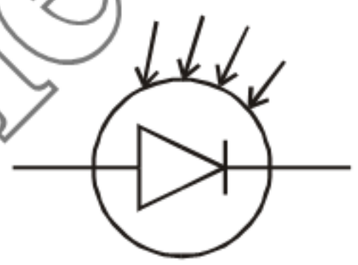
(a) Forward biased **(b)** Reverse biased

(c) No biasing is required **(d)** None

165. Under ideal conditions, the collector current is:

(a) Equal to base current **(b)** Nearly equal to emitter current

(c) Less than base current **(d)** Always zero

166. The symbol  represents:

(a) LED **(b)** Photodiode

(c) Diode **(d)** All

167. One use of a single p-n junction semiconductor in an electrical circuit is a:

(a) Rectifier **(b)** Transistor

(c) Battery **(d)** Diode

168. The main difference between intrinsic and extrinsic semiconductor, under ambient condition, is:

(a) Shape **(b)** Density

(c) Electrons **(d)** Resitivity

169. The output from a full wave rectifier is.

(a) An ac voltage **(b)** A dc voltage

(c) Zero **(d)** A pulsating unidirectional voltage

170. A piece of copper and another of germanium are cooled from room temperature to 80K. The resistance of:

(a) Each of them increases

(b) Each of them decreases

(c) Copper increases and that of germanium decreases

(d) Copper decreases and that of germanium increases

171. The electrical conductivity of a semiconductor increases if electromagnetic radiation of wavelength shorter than 2066 nm is incident on it. The band gap energy (in eV) for the semiconductor is very nearly equal to.

(a) 0.5 **(b)** 0.6

(c) 0.8 **(d)** 1.2

ANSWERS									
1.	(b)	**2.**	(b)	**3.**	(b)	**4.**	(c)	**5.**	(a)
6.	(d)	**7.**	(a)	**8.**	(b)	**9.**	(c)	**10.**	(a)
11.	(c)	**12.**	(b)	**13.**	(a)	**14.**	(c)	**15.**	(a)
16.	(d)	**17.**	(c)	**18.**	(a)	**19.**	(c)	**20.**	(c)
21.	(c)	**22.**	(c)	**23.**	(b)	**24.**	(c)	**25.**	(b)
26.	(a)	**27.**	(d)	**28.**	(b)	**29.**	(a)	**30.**	(c)
31.	(a)	**32.**	(d)	**33.**	(b)	**34.**	(d)	**35.**	(b)
36.	(c)	**37.**	(d)	**38.**	(a)	**39.**	(b)	**40.**	(b)
41.	(a)	**42.**	(c)	**43.**	(d)	**44.**	(a)	**45.**	(c)
46.	(a)	**47.**	(d)	**48.**	(c)	**49.**	(a)	**50.**	(c)
51.	(a)	**52.**	(c)	**53.**	(d)	**54.**	(a)	**55.**	(b)
56.	(a)	**57.**	(b)	**58.**	(b)	**59.**	(a)	**60.**	(a)
61.	(b)	**62.**	(a)	**63.**	(c)	**64.**	(b)	**65.**	(b)
66.	(a)	**67.**	(b)	**68.**	(c)	**69.**	(b)	**70.**	(c)
71.	(a)	**72.**	(c)	**73.**	(d)	**74.**	(a)	**75.**	(a)
76.	(b)	**77.**	(a)	**78.**	(b)	**79.**	(c)	**80.**	(a)
81.	(b)	**82.**	(d)	**83.**	(a)	**84.**	(c)	**85.**	(a)
86.	(a)	**87.**	(c)	**88.**	(d)	**89.**	(d)	**90.**	(a)
91.	(d)	**92.**	(a)	**93.**	(c)	**94.**	(b)	**95.**	(d)
96.	(d)	**97.**	(a)	**98.**	(c)	**99.**	(a)	**100.**	(a)
101.	(d)	**102.**	(d)	**103.**	(d)	**104.**	(d)	**105.**	(a)
106.	(c)	**107.**	(b)	**108.**	(c)	**109.**	(a)	**110.**	(b)
111.	(c)	**112.**	(a)	**113.**	(b)	**114.**	(d)	**115.**	(b)
116.	(a)	**117.**	(a)	**118.**	(a)	**119.**	(b)	**120.**	(a)
121.	(c)	**122.**	(a)	**123.**	(b)	**124.**	(b)	**125.**	(a)
126.	(b)	**127.**	(c)	**128.**	(b)	**129.**	(c)	**130.**	(b)
131.	(a)	**132.**	(b)	**133.**	(d)	**134.**	(a)	**135.**	(d)
136.	(a)	**137.**	(b)	**138.**	(b)	**139.**	(a)	**140.**	(b)
141.	(a)	**142.**	(a)	**143.**	(d)	**144.**	(d)	**145.**	(d)
146.	(b)	**147.**	(d)	**148.**	(a)	**149.**	(c)	**150.**	(b)
151.	(a)	**152.**	(b)	**153.**	(a)	**154.**	(c)	**155.**	(a)
156.	(a)	**157.**	(d)	**158.**	(d)	**159.**	(b)	**160.**	(c)
161.	(c)	**162.**	(b)	**163.**	(c)	**164.**	(c)	**165.**	(b)
166.	(b)	**167.**	(a)	**168.**	(d)	**169.**	(d)	**170.**	(d)
171.	(c)								

DAWN OF MODERN PHYSICS

Each question has four possible answers, tick (✓) the correct answer:

1. The classical physics is based on the laws of:

(a) Quantum mechanics **(b)** Newtonian mechanics

(c) Relativistic mechanics **(d)** None of these

2. Mathematical foundations for electromagnetic waves was provided by:

(a) Hertz **(b)** Ampere

(c) Maxwell **(d)** Newton

3. Mathematical formulation for electromagnetic waves is given the name:

(a) Hamiltons equation **(b)** Langrange's equation

(c) Maxwell's equation **(d)** None of these

4. Which one of the following waves require a material medium for their propagation:

(a) X-rays **(b)** Light waves

(c) γ-rays **(d)** Sound waves

5. Which one of the following scientists regarded light as electromagnetic waves:

(a) Maxwell **(b)** de-Broglie

(c) Newton **(d)** Galileo

6. Which one of the following paved the way for modern physics:

(a) Newtonian mechanics **(b)** Theory of relativity

(c) Quantum theory **(d)** All of above

7. Absolute motion cannot be detected:

(a) In different frame of reference **(b)** Its own frame of reference

(c) Both in its frame and different frame **(d)** None of these

8. Point out the formulation that does not depend the choice of reference frames:

(a) Velocity of object **(b)** Newton's law of motion

(c) Quantum theory **(d)** None of above

9. An inertial frame of reference is that:

(a) Which is at rest on earth **(b)** Which moves with uniform velocity

(c) Whose acceleration is zero **(d)** All of above

10. A non-inertial frame of reference is that:

(a) Is always at rest **(b)** Moves with some acceleration

(c) Moves with uniform velocity **(d)** None of these

11. Light was considered as electromagnetic waves by the scientist:

(a) Newton **(b)** Maxwell

(c) Hertz **(d)** Gallilo

12. All motions are:

(a) Uniform **(b)** Relative

(c) Absolute **(d)** Variable

13. Newton's laws of motion are valid:

(a) In non-inertial frame **(b)** In inertial frame

(c) Both (a) and (b) **(d)** None of these

14. The concept of direction is purely:

(a) Relative **(b)** Absolute

(c) Relative to the motion **(d)** None of these

15. Due to relative motion of observer and the frame of reference of events time always:

(a) Dilates itself **(b)** Stretches itself

(c) Both (a) and (b) **(d)** None of these

16. The dilation of time applies to the timing process which are:

(a) Chemical **(b)** Biological

(c) Physical **(d)** All of these

17. Aging process of a human body:

(a) Becomes fast **(b)** Becomes slow

(c) No change **(d)** None of these

18. Mass of an object is:

(a) Constant quantity **(b)** Varying quantity

(c) Depends upon the speed of light **(d)** None of these

19. Earth orbital speed is:

(a) 30 cm/s **(b)** 30 km/s

(c) 30 m/s **(d)** 0.3 m/s

20. When the atomic particles are moving with velocities approaching that of light:

(a) Newton's laws become valid **(b)** Newton's laws become invalid

(c) Relativistic effects become prominent **(d)** None of these

21. From $\Delta m = \frac{\Delta E}{C^2}$ that to get even a small increase in mass of an object, we require:

(a) Very small changes in energy **(b)** Large changes in energy

(c) Small changes in energy **(d)** No change in energy

22. In 1905, the special theory of relativity was proposed by:

(a) Clark Maxwell **(b)** de-Broglie

(c) Bohr **(d)** Einstein

23. Which one of the following physical quantities change with relativistic speed:

(a) Length **(b)** Time

(c) Mass **(d)** All of above

24. If an object moves with speed of light, its mass becomes:

(a) Zero **(b)** Infinity

(c) No change **(d)** None of these

25. The speed of light in free space is:

(a) 3×10^8 m/s **(b)** 3×10^7 m/s

(c) 3×10^9 m/s **(d)** 3×10^6 m/s

26. Due to the relative motion of observer and frame of reference, time:

(a) Contracts **(b)** Dilates

(c) Constant **(d)** Uniform

27. Earth is considered as:

(a) Inertial fame of reference **(b)** Non-inertial frame of reference

(c) Both (a) and (b) **(d)** None of these

28. Any coordinate system relative to which results are taken is known as:

(a) Zero point **(b)** Frame of reference

(c) Infinity point **(d)** None of these

29. The special theory of relativity is based upon:

(a) 3 postulates **(b)** 2 postulates

(c) 4 postulates **(d)** None of these

30. According to special theory of relativity all laws of physics are same in all:

(a) Accelerated frames **(b)** None accelerated frames

(c) Non inertial frames **(d)** None of these

31. The special theory of relativity is applicable to the objects moving with maximum velocity:

(a) Less than speed of light **(b)** Equal to speed of light

(c) More than speed of light **(d)** None of these

32. According to special theory of relativity, an expression for time dilation is given by:

(a) $t = t_o \sqrt{1 - \frac{V^2}{C^2}}$ **(b)** $t = \frac{t_o}{\sqrt{1 - \frac{V^2}{C^2}}}$

(c) $t = \frac{t_o}{1 - \frac{V^2}{C^2}}$ **(d)** $t = t_o \left(1 - \frac{V^2}{C^2}\right)$

33. In special theory, an expression for length contraction is:

(a) $l = l_o \left(1 - \frac{V^2}{C^2}\right)$ **(b)** $l = l_o \sqrt{1 - \frac{V^2}{C^2}}$

(c) $l = l_o \sqrt{1 - \frac{C^2}{V^2}}$ **(d)** None of these

34. In an expression, for time dilation, the factor $\sqrt{1-\frac{V^2}{C^2}}$ is always:

(a) Equal to one **(b)** Equal to zero

(c) Less than one **(d)** More than one

35. In special theory of relativity, an expression for mass variation is:

(a) $m = \frac{m_o}{\sqrt{1-\frac{V^2}{C^2}}}$ **(b)** $m = \frac{m_o}{\sqrt{1-\frac{C^2}{V^2}}}$

(c) $m = m_o\sqrt{1-\frac{V^2}{C^2}}$ **(d)** None of these

36. When an object moves with speed of light, its length:

(a) Remain unchanged **(b)** Increases

(c) Decreases **(d)** None of these

37. If an object moves with speed of light, then its apparent length becomes:

(a) Zero **(b)** Larger

(c) Smaller **(d)** Infinity

38. The mass and energy of an object are related by the expression:

(a) $E = \frac{m}{C^2}$ **(b)** $E = mc^2$

(c) $E = \frac{C^2}{m}$ **(d)** $E = mc$

39. According to special theory of relativity, mass and energy are different quantities and:

(a) Non-inter convertible **(b)** Inter convertible

(c) No change **(d)** None of these

40. The nature of radiation emitted from a hot body depends upon:

(a) Temperature **(b)** Material

(c) Length **(d)** Mass

41. At low temperature, the hot body emits the radiation of:

(a) Shorter wavelength **(b)** High energy

(c) Low energy **(d)** Both (a) and (b)

42. At high temperature, the hot body emits the radiation of:

(a) High energy and shorter wavelength **(b)** Longer wavelength and high energy

(c) Low energy and shorter wavelength **(d)** Shorter wavelength

43. The radiations of longer wavelength:

(a) Have low energy **(b)** Have high energy

(c) At high temperature **(d)** Both (a) and (b)

44. When platinum wire is heated, then it become ———— at temperature 500°C.

(a) White **(b)** Green

(c) Yellow **(d)** Dull red

45. Black colour is:

(a) Good absorber of heat **(b)** Bad absorber of heat

(c) Both (a) and (b) **(d)** None of these

46. For a black body, the product of λ_m and T known as:

(a) Wien's constant **(b)** Planck's constant

(c) Davison constant **(d)** Lumber's constant

47. The value of Wien's constant is measured in:

(a) m.K **(b)** mK^{-1}

(c) $m^{-1}K$ **(d)** $m^{-1}K^{-1}$

48. In SI units, the value of Wien's constant is:

(a) 9.8 mK **(b)** 2.9×10^{-3} mK

(c) 6.63×10^{34} mK **(d)** 3×10^{8} mK

49. The ratio of the energy E to the corresponding frequency f of the radiation emitted or absorbed is known as:

(a) Boltzman constant **(b)** Steffen's constant

(c) Wien's constant **(d)** Planck's constant

50. Max planck awarded the noble prize for his discovery of energy quanta in:

(a) 1918 A.D **(b)** 1920 A.D

(c) 1718 A.D **(d)** 1818 A.D

51. In SI units the value of Stefen's constant is:

(a) $6.63\times10^{-34}\ wm^{-2}k^{-4}$ **(b)** $2.9\times10^{-3}\ wm^{-2}k^{-4}$

(c) $5.67\times10^{-8}\ wm^{-2}k^{-4}$ **(d)** $3\times10^{8}\ wm^{-2}k^{-4}$

52. In SI units the value of Planck constant is:

(a) 6.63×10^{-34} J.S **(b)** 2.9×10^{-3} J.S

(c) 5.67×10^{-8} J.S **(d)** 3×10^{8} J.S

53. The idea of matter waves was given by:

(a) Einstein **(b)** de-Broglie

(c) Planck **(d)** Davison and Germer

54. The de-Broglie wavelength "λ"associated with a particle of mass "m" moving with velocity V is given by:

(a) $\lambda = mvh$ **(b)** $\lambda = \frac{1}{mvh}$

(c) $\lambda = \frac{h}{mv}$ **(d)** $\lambda = \frac{mv}{h}$

55. The de-Broglie wavelength λ of a particle of mass m and momentum P is given by:

(a) $\lambda = \frac{p}{h}$ **(b)** $\lambda = \frac{h}{p}$

(c) $\lambda = ph$ **(d)** None of these

56. The electrons behave as waves because they can be:

(a) Deflected by electric field **(b)** Ionize as gas

(c) Deflected by magnetic field **(d)** Diffracted by crystals

57. A photon of frequency f has an energy:

(a) $E = hf$ **(b)** $E = \frac{h}{f}$

(c) $E = \frac{f}{h}$ **(d)** None of these

58. If the momentum of particle is doubled, than its de-Broglie wavelength:

(a) Doubles **(b)** Halves

(c) Remain unchanged **(d)** None of these

59. In Davison and Germer experiment, nickel crystal acts as a:

(a) Perfect reflector **(b)** Perfect absorber

(c) Two dimensional grating **(d)** Three dimensional grating

60. The Davison and Germer experiment relates to:

(a) Diffusion **(b)** Interference

(c) Polarization **(d)** Electron diffraction

61. In Davison and Germer experiment, the angle between incident beam and diffracted beam is called:

(a) Angle of incidence **(b)** Glancing angle

(c) Angle of diffraction **(d)** Angle

62. In Davison and Germer expert, the angle which the incident beam makes with the normal to the nicked crystal is:

(a) 69° **(b)** 65°

(c) 90° **(d)** 180°

63. The uncertainty principle was given by:

(a) de-Broglie **(b)** Heisenberg

(c) Einstein **(d)** Max Planck

64. The uncertainty principle applicable to:

(a) Small system only **(b)** Large system only

(c) Sub-atomic particles only **(d)** Both sub-atomic and large system

65. The uncertainty principle is applicable only when:

(a) Momentum is measured only

(b) Position is measured only

(c) Both position and momentum are measured

(d) None of these

66. The uncertainty principle is significant for:

(a) Macroscopic bodies **(b)** Microscopic bodies

(c) Both microscopic and microscopic **(d)** None of these

67. The uncertainty principle relates uncertainties in the measurements of energy and:

(a) Velocity **(b)** Time

(c) Momentum **(d)** Mass of the particle

68. The uncertainty in the location of a particle is equal to its de-Broglie wavelength, then uncertainty in its velocity will be equal to:

(a) Four times its velocity **(b)** Twice its velocity

(c) Half of its velocity **(d)** Its velocity

69. Photoelectric effect was discovered by:

(a) Einstein **(b)** G.P Thomson

(c) Hall wades **(d)** Bohr

70. The photoelectric effect predicts that light is made of:

(a) Photons **(b)** Neutrons

(c) Protons **(d)** None of these

71. The phenomenon of photoelectric effect was first explained by:

(a) Einstein **(b)** Bohr

(c) Maxwell **(d)** Planck

72. The way through which electromagnetic radiation or photons interact with matter depends upon their:

(a) Frequency **(b)** Energy

(c) Wave length **(d)** All of the above

73. The process through which photons can interact with matter is:

(a) Photo electric effect **(b)** Compton effect

(c) Pair production **(d)** Any of these

74. The amount of photoelectric current depends upon:

(a) Intensity of light beam **(b)** Energy of incident photons

(c) Stopping potential **(d)** All of the above

75. While demonstrating the photoelectric effect the stopping potential is achieved when:

(a) Anode is made more and more positive **(b)** Battery is switched off

(c) Photo electric current becomes Zero **(d)** None of these

76. If the photoelectric current is goes on decreasing it means that:

(a) Photons are attracted by the anode **(b)** Photoelectrons are attracted by the anode

(c) Photoelectrons are repelled by the anode **(d)** Electrons are repelled by the anode

77. Threshold frequency is the:

(a) Varies from metal to metal

(b) Minimum frequency below which no electron is emitted

(c) Same for all metals

(d) Both (a) and (b)

78. Einstein was received the noble prize in the basis of:

(a) Quantum theory of light **(b)** Theory of relativity

(c) Explanation of photoelectric effect **(d)** Energy band theory

79. The unit of work function is:

(a) Electron volt **(b)** Ampere

(c) Volt cell **(d)** Hz

80. A photocell can be used to operate:

(a) Counting system **(b)** Security system

(c) Automatic door system **(d)** All of above

81. A photon is a:

(a) Positively charged particle **(b)** Quantum of radiation

(c) Unit of Energy **(d)** Unit of wavelength

82. When the stopping potential is applied to the anode of photocell, no current is absorbed. This mean:

(a) The emission of photoelectrons stops

(b) The photoelectrons are emitted but are reabsorbed by the photo cathode itself

(c) Both (a) and (b)

(d) None of these

83. The best metal to be used for photoemission is:

(a) Cesium **(b)** Lithium

(c) Potassium **(d)** Sodium

84. Photoelectric effect was discovered by:

(a) Lenard **(b)** Einstein

(c) Hertz **(d)** Neutron

85. Which conservation law is obeyed in Einstein photoelectric equation:

(a) Momentum **(b)** Charge

(c) Mass **(d)** Energy

86. If the energy of photon is 10 eV and work function is 5 eV, then the a value of stopping potential will be:

(a) 50 V **(b)** 2 V

(c) 5 V **(d)** 15 V

87. When a photon of energy 7 eV is made incident on a metal then emitted electron is stopped by a stopping potential –5.5 V. The work function of the metal will be:

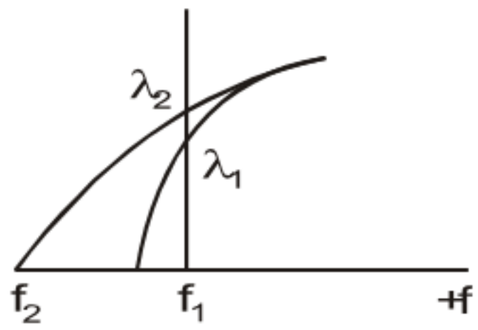
(a) 12.5 eV **(b)** –1.5 eV

(c) 37.5 eV **(d)** 1.5 eV

88. In the equation if $f_2 > f_1$ then:

(a) $\lambda_1 > \lambda_2$ **(b)** $\lambda_1 = \sqrt{\lambda_2}$

(c) $\lambda_1 = \lambda_2$ **(d)** $\lambda_1 < \lambda_2$



89. Which of the following makes use of photoelectric effect:

(a) Television camera **(b)** Television receiver

(c) Radar **(d)** CRO

90. The work function for photoelectric effect:

(a) Same for all metals **(b)** Depends on the frequency

(c) different for different metals **(d)** None of these

91. In photoelectric emission, the energy of emitted electron is:

(a) Larger than that of photon **(b)** Less than that of photon

(c) Same as that of photon **(d)** None of these

92. Einstein photoelectric equation is:

(a) $hf = \phi + \frac{1}{2} mV^2_{max}$ **(b)** $\phi = hf + \frac{1}{2} V^2_{max}$

(c) $hf + \phi = \frac{1}{2} m V^2_{max}$ **(d)** None of these

93. A photon of frequency f is incident on a metal surface whose threshold frequency is f_o then work function of metal will be:

(a) $h(f + f_o)$ **(b)** hf_o

(c) hf **(d)** Zero

94. The photoelectric current depends upon:

(a) Intensity of the incident radiation

(b) Frequency of incident photon only

(c) Intensity and frequency of incident radiation

(d) None of these

95. The velocity of the photoelectron depends upon:

(a) Intensity of incident photon

(b) Frequency of incident photon

(c) Intensity as well as frequency of incident photon

(d) None of these

96. The study of photoelectric effect is useful for understanding:

(a) The quantum nature of matter **(b)** The wave nature of matter

(c) Bohr's atomic model **(d)** Structure of the nucleus

97. The stopping voltage in photoelectric effect depends upon:

(a) Nature of the metal surface **(b)** Intensity of incident light

(c) Frequency of incident light **(d)** Frequency as well as metal surface

98. The cut off voltage is independent of intensity of incident light if:

(a) Material of electrode is fixed

(b) Frequency of incident light

(c) Frequency and material of electrode are fixed

(d) None of these

99. The photoelectric threshold frequency depends upon.

(a) Frequency **(b)** Nature of material

(c) Intensity of light **(d)** None of them

100. The maximum number of the photoelectrons released in photocell is independent of:

(a) Frequency of incident light **(b)** Nature of the cathode surface

(c) Intensity of the radiations **(d)** None of these

101. A milliammeter in the circuit of a photo cell measures:

(a) Energy of photon **(b)** Velocity of photoelectrons

(c) Number of electrons released per second **(d)** None of these

102. The photoelectric effect is based upon the conservation of:

(a) Angular momentum **(b)** Energy

(c) Momentum **(d)** Mass

103. Which statement about a photon is invalid:

(a) Its momentum is $\frac{hf}{c}$ **(b)** Its total energy is hf

(c) It has zero rest mass **(d)** Its mass is $\lambda^2 f^2$

104. The Compton effect is associated with:

(a) X-rays **(b)** γ-rays

(c) Positive rays **(d)** β-rays

105. The Compton effect in x-rays proves that:

(a) X-rays have wave characteristics **(b)** X-rays have particle characteristic

(c) Electron have wave characteristics **(d)** None of these

106. An ideal black body is:

(a) A perfect absorber of radiation **(b)** The most efficient radiation

(c) A body when hot emits radiation **(d)** All of the above

107. The wavelength corresponding to maximum intensity of radiation shifts steadily towards shorter wavelength:

(a) The temperature decreases **(b)** The temperature increases

(c) The temperature is constant **(d)** The temperature is zero

108. Radiations are always emitter or absorbed in the form of packet of energy. This is a statement of:

(a) Stefan's law **(b)** Planck's quantum law

(c) Einstein law **(d)** None of these

109. A good absorber of heat radiation would be:

(a) A black body **(b)** A polished plate

(c) A white plate **(d)** None of the above

110. Black bodies are formed of:

(a) Reflecting solid objects **(b)** Metals

(c) No-reflecting objects **(d)** Non-metals

111. A black body becomes white at temperature:

(a) 1300°C **(b)** 900°C

(c) 1500°C **(d)** 1600°C

112. A body emits radiation which is of long or wavelength in visible infrared region at:

(a) Low temperature **(b)** High temperature

(c) At constant temperature **(d)** None of these

113. The nature of radiation emitted by a body depends upon:

(a) Mass **(b)** Temperature

(c) Volume **(d)** Pressure

114. At high temperature, a body emits radiations of:

(a) Long wavelength **(b)** Small wavelength

(c) Intermediate wavelength **(d)** None of these

115. At low temperature, a body generally emit radiations of:

(a) Long wavelength **(b)** Small wavelength

(c) Intermediate wavelength **(d)** None of these

116. The relation between work function and maximum energy of photoelectrons was discovered by:

(a) Stefan **(b)** Marely

(c) Planck **(d)** Einstein

117. The Compton effect was presented in:

(a) 1933 **(b)** 1924

(c) 1920 **(d)** 1923

118. Compton effect was presented by:

(a) Einstein **(b)** Ampere

(c) Auther holly Compton **(d)** None of these

119. In Compton effect, the wavelength of scattered photons as compared to the wavelength of incident x-rays is:

(a) Larger **(b)** Smaller

(c) Constant **(d)** None of these

120. Compton considered that x-rays consist of:

(a) Neutrons **(b)** Protons

(c) Electrons **(d)** Photons

121. The expression derived by Compton for Compton shift scattering an angle θ is given as:

(a) $\Delta\lambda = \frac{h}{m_o c}(1 - \cos\theta)$ **(b)** $\Delta\lambda = h(1 - \cos\theta)$

(c) $\Delta\lambda = m_o c(1 - \cos\theta)$ **(d)** $\Delta\lambda = \frac{m_o c}{n}(1 - \cos\theta)$

122. The numerical value of Compton wavelength is equal to:

(a) 3.43×10^{-12} m **(b)** 1.43×10^{-12} m

(c) 2.43×10^{-12} m **(d)** 0.43×10^{-12} m

123. In Compton effect the change in wavelength of a scattered photon is called:

(a) Compton shift **(b)** Einstein equation

(c) Angle of refractions **(d)** None of these

124. Author Holly Compton was awarded Nobel Prize in:

(a) 1927 **(b)** 1928

(c) 1923 **(d)** 1931

125. A.H Compton studies the scattering of x-rays by:

(a) Tightly bounded positrons **(b)** Loosely bounded electrons

(c) Tightly bounded electrons **(d)** Loosely bounded photons

126. A.H Compton studies the scattering of x-rays by loosely bounded electrons from:

(a) Copper crystal **(b)** NaCl crystal

(c) Graphite target **(d)** None of these

127. Compton shift is actually the change in:

(a) Mass of incident photon **(b)** Wavelength of incident photon

(c) Charge on photon **(d)** All of the above

128. When X-rays are scattered by loosely bounded electrons from graphite target, which is known as:

(a) Photoelectric effect **(b)** Compton effect

(c) Thomson effect **(d)** None of these

129. Compton shift refers to:

(a) Proton **(b)** Meson

(c) Positron **(d)** Photon

130. The process of conversion of a photons into an electron and a positron is known as:

(a) Compton effect **(b)** Photoelectric effect

(c) Pair production **(d)** None of these

131. The process of pair production is also known as:

(a) Compton effect **(b)** Photoelectric effect

(c) Materialization of energy **(d)** None of these

132. The minimum energy required for the pair production is:

(a) 0.21 MeV **(b)** 0.12 MeV

(c) 1.02 MeV **(d)** None of these

133. The process of pair production takes place if the energy of photon is:

(a) Greater than $2m_oc^2$ **(b)** Less than $2m_oC^2$

(c) Equal to $2m_oC^2$ **(d)** None of these

134. The reverse process of pair production is called:

(a) Materialization of energy **(b)** Compton effect

(c) Annihilation of matter **(d)** None of these

135. Positron was discovered by:

(a) Dirac **(b)** Anderson

(c) Wilson **(d)** None of these

136. The condition $hf > 2m_oc^2$ refers to the process of:

(a) Compton effect **(b)** Pair production

(c) Photoelectric effect **(d)** Annihilation of matter

137. The equation $e^- + e^+ \rightarrow \gamma + \gamma$ refers to:

(a) Compton effect **(b)** Pair production

(c) Annihilation of matter **(d)** Fusion process

138. In annihilation of matter, the two photons are produced traveling:

(a) In opposite direction **(b)** In same direction

(c) At on angle of 180° **(d)** Both (a) and (c)

139. The positron was discovered in:

(a) 1928 **(b)** 1828

(c) 1918 **(d)** 1923

140. Every particle with corresponding anti-particle with:

(a) The same mass **(b)** Opposite charge

(c) Different mass **(d)** Both (a) and (b)

141. Tick the correct equation in case of Davison and Germer experiment:

(a) $\frac{1}{2}\ mv^2 = ve$ **(b)** $mv = \sqrt{2mve}$

(c) $\lambda = \frac{h}{\sqrt{2mve}}$ **(d)** None of these

142. Uncertainty principle states that:

(a) $\Delta x \cdot \Delta E \approx h$ **(b)** $\Delta x \cdot \Delta P \approx h$

(c) $\Delta E \cdot \Delta P \approx h$ **(d)** None of these

143. Heisenberg uncertainty principle is used in:

(a) Wave mechanics **(b)** Classical mechanics

(c) Both (a) and (b) **(d)** Quantum mechanics

144. Strictly speaking, the Earth is:

(a) Inertial frame of reference **(b)** Non-inertial frame of reference

(c) Both (a), (b) **(d)** None

145. Time dilation applies to the timing process:

(a) Chemical **(b)** Physical

(c) Biological **(d)** All

146. The length contraction happens:

(a) Along the direction of motion **(b)** Perpendicular to direction of motion

(c) Both (a), (b) **(d)** None

147. Earth's orbital speed is:

(a) 30 km/s **(b)** 30 m/s

(c) 30 km/h **(d)** None

148. Mass of an object moving with 0.8 C is:

(a) Zero **(b)** Infinite

(c) $\frac{m_o}{\sqrt{0.36}}$ **(d)** $\sqrt{0.36}\, m_o$

149. For a black body, the product of λ_{max} and T is equal to:

(a) Wien's constant **(b)** Planck's constant

(c) Davison constant **(d)** Dirac constant

150. Unit of Stephen's constant is:

(a) $W\, m\, K^{-2}$ **(b)** $W\, m^{-2}\, K^{-4}$

(c) $W\, m\, K^{-4}$ **(d)** None

151. Stopping potential of photoelectrons:

(a) Increase with increase in intensity **(b)** Decrease with increase in intensity

(c) Independent of intensity **(d)** None

152. The energy of photon of radio waves is about:

(a) 10^{-4} eV **(b)** 10^{-6} J

(c) 10^{-8} eV **(d)** 10^{-10} eV

153. A photocell is used in:

(a) Security systems **(b)** Counting systems

(c) Automatic door systems **(d)** All

154. The inverse of photoelectric effect is:

(a) Emission of γ-rays **(b)** X-rays

(c) Thermionic emission **(d)** None

155. Pair production occurs only when energy of photon is at least equal to:

(a) 1.02 eV **(b)** 1.02 MeV

(c) 1.2 MeV **(d)** All

156. Interplanar distance (spacing) for nickel crystal:

(a) 0.91×10^{10} m **(b)** 0.91×10^{-10} m

(c) 0.91×10^{-6} m **(d)** None

157. A three dimensional image of remarkable quality can be achieved by:

(a) Electron microscope **(b)** Scanning electron microscope

(c) Optical microscope **(d)** All

158. Value of $\hbar$ =

(a) 1.05×10^{34} J **(b)** 1.05×10^{-34} Js

(c) 1.05×10^{-34} Ns **(d)** All

159. Which one of the following radiations has the strongest photon?

(a) Microwaves **(b)** X-rays

(c) γ-rays **(d)** None

160. Rest mass of photon is:

(a) Zero **(b)** Infinite

(c) 9.11×10^{-31} kg **(d)** None

161. Energy for 1 kg of mass is:

(a) 1×10^{6} eV **(b)** 5.6×10^{35} eV

(c) 9×10^{16} eV **(d)** None

162. Compton shift is maximum for scattering angle of photon:

(a) 0° **(b)** 90°

(c) 180° **(d)** 45°

163. Complete the electromagnetic spectrum microwaves, ————————, visible, ultraviolet.

(a) Infrared **(b)** X-rays

(c) γ-rays **(d)** Short radio waves

ANSWERS

1.	(b)	**2.**	(c)	**3.**	(c)	**4.**	(d)	**5.**	(a)
6.	(b)	**7.**	(b)	**8.**	(b)	**9.**	(d)	**10.**	(b)
11.	(b)	**12.**	(b)	**13.**	(b)	**14.**	(a)	**15.**	(c)
16.	(d)	**17.**	(b)	**18.**	(c)	**19.**	(b)	**20.**	(c)
21.	(a)	**22.**	(d)	**23.**	(d)	**24.**	(b)	**25.**	(a)
26.	(b)	**27.**	(b)	**28.**	(b)	**29.**	(b)	**30.**	(b)
31.	(b)	**32.**	(b)	**33.**	(b)	**34.**	(c)	**35.**	(a)
36.	(c)	**37.**	(a)	**38.**	(b)	**39.**	(b)	**40.**	(a)
41.	(d)	**42.**	(a)	**43.**	(a)	**44.**	(d)	**45.**	(a)
46.	(a)	**47.**	(a)	**48.**	(b)	**49.**	(d)	**50.**	(a)
51.	(c)	**52.**	(a)	**53.**	(b)	**54.**	(c)	**55.**	(b)
56.	(d)	**57.**	(a)	**58.**	(b)	**59.**	(d)	**60.**	(d)
61.	(b)	**62.**	(b)	**63.**	(b)	**64.**	(d)	**65.**	(c)
66.	(b)	**67.**	(b)	**68.**	(d)	**69.**	(c)	**70.**	(a)
71.	(a)	**72.**	(d)	**73.**	(d)	**74.**	(a)	**75.**	(c)
76.	(c)	**77.**	(d)	**78.**	(c)	**79.**	(a)	**80.**	(d)
81.	(b)	**82.**	(b)	**83.**	(a)	**84.**	(b)	**85.**	(d)
86.	(c)	**87.**	(d)	**88.**	(a)	**89.**	(a)	**90.**	(c)
91.	(b)	**92.**	(a)	**93.**	(b)	**94.**	(c)	**95.**	(b)
96.	(a)	**97.**	(d)	**98.**	(c)	**99.**	(b)	**100.**	(c)
101.	(c)	**102.**	(b)	**103.**	(d)	**104.**	(a)	**105.**	(b)
106.	(d)	**107.**	(b)	**108.**	(b)	**109.**	(a)	**110.**	(a)
111.	(d)	**112.**	(a)	**113.**	(b)	**114.**	(b)	**115.**	(a)
116.	(d)	**117.**	(d)	**118.**	(c)	**119.**	(a)	**120.**	(d)
121.	(a)	**122.**	(c)	**123.**	(a)	**124.**	(a)	**125.**	(b)
126.	(c)	**127.**	(b)	**128.**	(b)	**129.**	(d)	**130.**	(c)
131.	(c)	**132.**	(c)	**133.**	(a)	**134.**	(c)	**135.**	(a)
136.	(b)	**137.**	(c)	**138.**	(d)	**139.**	(a)	**140.**	(d)
141.	(c)	**142.**	(b)	**143.**	(d)	**144.**	(b)	**145.**	(d)
146.	(a)	**147.**	(a)	**148.**	(c)	**149.**	(a)	**150.**	(b)
151.	(c)	**152.**	(d)	**153.**	(d)	**154.**	(b)	**155.**	(b)
156.	(b)	**157.**	(b)	**158.**	(b)	**159.**	(c)	**160.**	(a)
161.	(b)	**162.**	(b)	**163.**	(a)				

Chapter 20

ATOMIC SPECTRA

Each question has four possible answers, tick (✓) the correct answer:

1. Rutherford concluded that central part of an atom is:

(a) Electrically neutral **(b)** Positively charged

(c) Negatively charged **(d)** None of above

2. The first theory about the structure of an atom was introduced by:

(a) Neil Bohr **(b)** Einstein

(c) Compton **(d)** Rutherford

3. Bohr's postulates explained by:

(a) de-Broglie **(b)** Einstein

(c) Newton **(d)** Rutherford

4. de-Broglie's wavelength is:

(a) $\lambda = hv$ **(b)** $\lambda = hp$

(c) $\lambda = \frac{h}{2\lambda}$ **(d)** $\lambda = \frac{h}{p}$

5. Study of hydrogen visible spectrum in:

(a) 1886 **(b)** 1887

(c) 1895 **(d)** 1885

6. Bohr was presented atomic model of hydrogen in:

(a) 1913 **(b)** 1919

(c) 1918 **(d)** 1905

7. According to Bohr theory only those orbit are allowed along which angular momentum of electron is:

(a) $\frac{2\pi}{nh}$ **(b)** $\frac{nh}{2\pi}$

(c) $\frac{n}{2\pi h}$ **(d)** $\frac{2\pi n}{h}$

8. The scientist who studies the spectrum of hydrogen in visible light, wavelength range was:

(a) Rydberg **(b)** Bohr

(c) Balmer **(d)** Paschen

9. The first series, which was identified in the spectrum of hydrogen is called:

(a) Balmer series **(b)** Lyman series

(c) Paschen series **(d)** Brakett series

10. Balmer series was identified in:

(a) 1685 **(b)** 1785

(c) 1985 **(d)** 1885

11. Balmer series lies in that region of electromagnetic wave spectrum, which is known as:

(a) Visible region **(b)** Invisible region

(c) Ultraviolet region **(d)** Infra-red region

12. The results of spectra obtained by Balmer were expressed in 1896 by:

(a) Newton **(b)** Bohr

(c) Rydberg **(d)** Planck

13. The process of formation of spectrum is known as:

(a) Diffraction **(b)** Interferences

(c) Refraction **(d)** Spectroscopy

14. The value of Rydberg constant is:

(a) $1.0974 \times 10^{7}\ m^{-1}$ **(b)** $1.0974 \times 10^{-7}\ m^{-1}$

(c) $1.0974 \times 10^{6}\ m^{-1}$ **(d)** $1.0974 \times 10^{-6}\ m^{-1}$

15. Spectrum shows the number of component colour present in certain light in terms of:

(a) Frequency **(b)** Energy

(c) Wavelength **(d)** All of the above

16. Tick the series lies in visible region:

(a) Paschen series **(b)** Lyman series

(c) Pfund series **(d)** Balmer series

17. Tick the series lies infrared region:

(a) Paschen series **(b)** Brakett series

(c) Pfund series **(d)** All of the above

18. In the general formula in which all the series of hydrogen spectrum is given by:

(a) $\lambda = R_H\left(\frac{1}{p^2} - \frac{1}{n^2}\right)$ **(b)** $\frac{1}{\lambda} = R_H\left(\frac{1}{p^2} - \frac{1}{n^2}\right)$

(c) $\lambda = \frac{1}{R_H}\left(\frac{1}{p^2} - \frac{1}{n^2}\right)$ **(d)** $\lambda = R_H\left(\frac{1}{n^2} - \frac{1}{p^2}\right)$

19. During the transition of electron of hydrogen atom from higher orbit to a third orbit, a photon of:

(a) Paschen series is emitted **(b)** Balmer series is emitted

(c) Lyman series is emitted **(d)** Brakett series is emitted

20. In the general formula for spectral series, if we put P = 3, we get the formula for:

(a) Paschen series **(b)** Blamer series

(c) Lyman series **(d)** Brakett series

21. An electron of the hydrogen atom in the second orbit, is called its:

(a) Ground state **(b)** Ionized state

(c) Excited state **(d)** None of these

22. Which of the following is one of the spectral series of atomic hydrogen:

(a) Brockett series **(b)** Balmer series

(c) P fund series **(d)** All of above

23. An example of an absorption spectrum is the spectrum of:

(a) Sodium vapour **(b)** Molten iron

(c) Atomic hydrogen **(d)** Mercury vapour lamp

24. The radiations emitted from hydrogen filled discharge tube shows:

(a) Continuous spectrum **(b)** Line spectrum

(c) Band spectrum **(d)** None of these

25. The spectral series that contains transitions terminating on the ground level of hydrogen is called:

(a) Paschen series **(b)** P fund series

(c) Balmer series **(d)** Lyman series

26. In hydrogen spectrum, which one the following series lies in the ultraviolet region:

(a) Lyman series **(b)** Balmer series

(c) P fund series **(d)** Brackett series

27. In hydrogen atom, which one of the following series lies in the infrared region:

(a) Lyman series **(b)** Brackett series

(c) Paschen series **(d)** Balmer series

28. The longest wavelength of light which ionizes a hydrogen atom is:

(a) 912 A° **(b)** 0.74 A°

(c) 400 A° **(d)** 720 A°

29. Radiations with wavelengths longer than red light is called:

(a) Visible radiation **(b)** Infrared radiation

(c) Ultraviolet radiation **(d)** X-rays

30. Radiation, with wavelength shorter than violet is called:

(a) Ultraviolet radiation **(b)** Infrared radiation

(c) Visible radiation **(d)** None of these

31. Electromagnetic rays which lies above the x-rays region are called:

(a) γ-rays **(b)** Infrared radiations

(c) Ultraviolet radiation **(d)** None of these

32. Rutherford's nuclear model predicted:

(a) Discrete spectra of atoms **(b)** Continuous spectra of atoms

(c) Both (a) and (b) **(d)** None of these

33. For the stability of nuclear model, Rutherford proposed:

(a) Static equilibrium **(b)** Dynamic equilibrium

(c) Neutral equilibrium **(d)** None of these

34. According to Rutherford nuclear model, the major constituents of the nucleus are:

(a) Neutrons and electrons **(b)** Protons and positrons

(c) Neutron and protons **(d)** Protons and electrons

35. Net force on an electron in an orbit around the nucleus is:

(a) Positive **(b)** Zero

(c) Negative **(d)** None of these

36. In Bohr atomic model, the electron does not fall into the nucleus because:

(a) The electron is not a particle

(b) The quantum rules does not allow it

(c) The electrostatic attraction is balanced by mechanical force

(d) None of these

37. Brackett series is obtained when electronic transitions terminate on the:

(a) 1^{st} orbit **(b)** 2^{nd} orbit

(c) 3^{rd} orbit **(d)** 4^{th} orbit

38. In Bohr's atomic model, the lowest orbit corresponds to:

(a) Zero energy **(b)** The minimum energy

(c) The maximum energy **(d)** None of these

39. Only those orbits are allowed for the electron of hydrogen atom for which orbital angular momentum is equal to an integral multiple of:

(a) $\frac{2\pi}{h}$ **(b)** $\frac{h}{2\pi}$

(c) $\frac{2\pi}{h}$ **(d)** $\frac{h}{2\pi}$

40. mvr is the expression for:

(a) Linear momentum **(b)** Angular momentum

(c) Torque **(d)** None of these

41. de-Broglie suggest for a length of Bohr's orbit that:

(a) $l = 2\pi r$ **(b)** $l = 2\pi \lambda$

(c) $l = \pi r^2$ **(d)** $\lambda l = 2\pi$

42. The radii of different orbits around the nucleus of an atom is given by:

(a) $r^2_n = nr_1$ **(b)** $r_n = n r^2_1$

(c) $r_n = n^2 r_1$ **(d)** $r_n = nr_1$

43. Balmer series is obtained when all the transitions of electron terminate on:

(a) 4^{th} orbit **(b)** 2^{nd} orbit

(c) 5^{th} orbit **(d)** 3^{rd} orbit

44. The orbital speed of an electron in the nth orbit is:

(a) $v_n = \dfrac{nh}{2\pi r_n m}$ **(b)** $v_n = \dfrac{nh}{\pi m r_n}$

(c) $v_n = \dfrac{2\pi m r_n}{nh}$ **(d)** None of these

45. The numerical value of ground state energy of an electron in an orbit is the measure of:

(a) Excitation energy **(b)** Excitation potential

(c) Ionization energy **(d)** None of these

46. The electric P.E of an electron in an orbit around the nucleus is:

(a) $\dfrac{-ke^2}{r_n}$ **(b)** $\dfrac{ke}{r^2 n}$

(c) $\dfrac{ke^3}{r^2 n}$ **(d)** $\dfrac{-ke^2}{r^2 n}$

47. If the ionization energy of hydrogen atom is 13.6 eV, its ionization potential will be:

(a) 136.0 volt **(b)** 3.0 volt

(c) 13.6 volt **(d)** None of these

48. The SI unit of Rydberg constant is:

(a) ms^{-1} **(b)** m

(c) sm^{-1} **(d)** m^{-1}

49. The experimental value of Rydberg's constant is:

(a) $1.0974 \times 10^7\ m^{-1}$ **(b)** $1.0974 \times 10^{-7}\ m^{-1}$

(c) $10.97 \times 10^{-7}\ m^{-1}$ **(d)** $109.1 \times 10^{-9}\ m^{-1}$

50. The radius of the nth orbit for hydrogen atom is:

(a) $\dfrac{4\pi^2 mke^2}{n^2 h^2}$ **(b)** $\dfrac{nh}{4\pi^2 mke^2}$

(c) $\dfrac{nh}{4\pi^2 kme^4}$ **(d)** $\dfrac{n^2 h^2}{4\pi^2 kme^2}$

51. The diameter of an atom is of the order of:

(a) 10^{-16} m **(b)** 10^{-8} m

(c) 10^{-10} m **(d)** 10^{10} m

52. The electrostatic force between the electron and the nucleus of hydrogen atom is given by:

(a) $F_e = \frac{ke}{r_n^2}$ **(b)** $F_e = \frac{ke^2}{r_n^2}$

(c) $Fe = \frac{ke^2}{r^2 n}$ **(d)** None of these

53. The centripetal force when an electron revolving around the nucleus is given by:

(a) $F_e = \frac{mv_n^2}{r_n}$ **(b)** $F_e = \frac{mv_n}{r_n^2}$

(c) $F_e = \frac{mv_n^2}{r_n^2}$ **(d)** None of these

54. The value of Planck's constant is:

(a) $9 \times 10^9\ Nm^2C^{-2}$ **(b)** 6.63×10^{-34} J.S

(c) 9.1×10^{-31} kg **(d)** 1.67×10^{-27} kg

55. The radius of 1st Bohr's orbit for hydrogen is:

(a) 0.053 nm **(b)** 0.53 nm

(c) 0.53 m **(d)** None of these

56. The total energy of an electron in the nth orbit of the hydrogen atom is given by:

(a) $E_n = \frac{-2\pi\ Kme^4}{n^2 h^2}$ **(b)** $E_n = \frac{-2\pi^2\ K^2me^4}{n^2 h^2}$

(c) $E_n = \frac{-2\pi\ K^2me^2}{n^2 h^2}$ **(d)** $E_n = \frac{-\pi\ K^2m^2e^2}{n^2 h^2}$

57. An expression for ground state energy of an electron is given by:

(a) $E_o = \frac{4\pi^2 k^2me^4}{h^2}$ **(b)** $E_o = \frac{4\pi\ Kme^4}{h^2}$

(c) $E_o = \frac{2\pi^2\ k^2me^4}{h^2}$ **(d)** $E_o = \frac{2\pi\ K^2\ me^4}{h^2}$

58. The 1st Bohr atom in the hydrogen atom has radius:

(a) 3.56×10^{-10} m **(b)** 0.053×10^{-11} m

(c) 0.53×10^{-11} m **(d)** 5.30×10^{-11} m

59. Mathematically, P fund series is written as:

(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$ **(b)** $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

(c) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ **(d)** $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$

60. Mathematically, Balmer series is written:

(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ **(b)** $\frac{1}{\lambda} = R_H\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$

(c) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ **(d)** None of these

61. Mathematically, Brackett series is written as:

(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ **(b)** $\frac{1}{\lambda} = R_H\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$

(c) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ **(d)** $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

62. When an electron exist in its lowest state it is called:

(a) Ground state **(b)** Excited state

(c) Both (a) and (b) **(d)** None of these

63. The photons emitted in inner shell transition are called:

(a) β-particle **(b)** Characteristic x-rays

(c) γ-particle **(d)** None of these

64. X-rays were discovered by:

(a) Curie **(b)** Henry Becquerel

(c) Rontgen **(d)** None of these

65. X-rays are similar in nature to:

(a) γ-rays **(b)** Positive rays

(c) α-particle **(d)** None of these

66. X-rays are:

(a) Electromagnetic waves **(b)** Mechanical waves

(c) Transverse waves **(d)** Longitudinal waves

67. The transition's of electrons in the hydrogen atom result in the emission of spectral lines in the:

(a) Visible region **(b)** Infra red region

(c) Ultra violet region **(d)** Any of these

68. X-ray tube used for production of X-rays contains:

(a) Air at pressure of 760 mm of Hg **(b)** Air at pressure of 76 cm of Hg

(c) No air at all **(d)** None of these

69. K_β x-ray is emitted when an electron from:

(a) M shell fills the vacancy of K shell **(b)** K shell fills the vacancy of M shell

(c) L shell fills the vacancy of K shell **(d)** Both (a) and (b)

70. The characteristic x-rays appear as:

(a) Discrete spectrum **(b)** Continuous spectrum

(c) Band spectrum **(d)** Discrete lines on continuous spectrum

71. Braking radiation causes:

(a) Discrete spectrum **(b)** Continuous spectrum

(c) Band spectrum **(d)** Line spectrum

72. By CAT scans, we can detect the density difference of the order of:

(a) 1% **(b)** 15%

(c) 10% **(d)** 50%

73. X-rays are diffracted by crystal but not by a diffraction grating because:

(a) The ions in a crystal are well arranged

(b) The lines in a diffraction grating cannot reflect x-rays

(c) The penetrating power of x-rays is in high in diffraction grating

(d) The wavelength of x-rays are the same order of magnitude as the separation between the atom in the crystal

74. The maximum frequency in the spectrum from x-rays tube is directly proportional to the:

(a) Number of incident electron

(b) The kinetic energy of the incident electron

(c) The soft target, which can easily emit electrons

(d) None of these

75. The characteristic x-rays spectrum is due to:

(a) The illumination of target metal by ultraviolet radiation

(b) The bombardment of the target by protons

(c) The bombardment of the target by electrons

(d) None of these

76. The minimum wavelength of x-rays can further be reduced by:

(a) Reducing the press use or cooling the target

(b) Increasing the temperature of the filament

(c) Using the target element of higher atomic number

(d) Increasing the potential difference

77. The penetrating power of x-rays is comparable with that of:

(a) β-rays **(b)** γ-rays

(c) x-rays **(d)** None of these

78. The penetrating power of x-rays depends upon their:

(a) Frequency **(b)** Applied voltage

(c) Wavelength **(d)** None of these

79. When x-rays are passed through aluminium sheets, what happens to their thickness:

(a) Decreases **(b)** Increases

(c) Remain the same **(d)** None of these

80. X-rays are:

(a) Of unknown nature **(b)** High energy photons

(c) High energy electrons **(d)** High energy positrons

81. The x-rays diffraction with crystal was first studied by:

(a) W.H Bragg **(b)** W.L. Bragg

(c) Michelson **(d)** None of these

82. X-ray photons cannot produce pair production because:

(a) Electromagnetic waves **(b)** Rest mass and charge is zero

(c) Energy is less than rest mass energy **(d)** None of these

83. K-series of characteristic x-rays spectrum results when all the transitions of inner-shell electrons terminate an:

(a) K-shell **(b)** M-shell

(c) L-shell **(d)** None of these

84. The first spectra line of K-series of characteristics x-rays spectrum results when:

(a) M-shell electron fall into K-shell **(b)** L-shell electron into K-shell

(c) N-shell electron fall into M-shell **(d)** None of these

85. Most efficient tube for production of x-rays was designed by:

(a) Maxwell in 1913 **(b)** Einstein in 1913

(c) Dr. Coolidge 1913 **(d)** Dr. Rontgen in 1913

86. For the production of x-rays, the target metal should be bombarded by:

(a) Electrons **(b)** Neutrons

(c) Protons **(d)** Positrons

87. Quality of x-rays depends upon:

(a) Accelerating voltage **(b)** Filament current

(c) Material of the target **(d)** Both (a) and (c)

88. The velocity of x-rays is equal to that of:

(a) α-rays **(b)** β-rays

(c) γ-rays **(d)** Speed of light

89. X-rays can be used to:

(a) Detect Bone Fracture **(b)** Detect Flows in welding

(c) Control of Cancer **(d)** All of above

90. X-rays exhibit the phenomenon of:

(a) Diffraction **(b)** Interference

(c) Polarization **(d)** All of the above

91. The rest mass of x-ray photon is:

(a) Zero **(b)** 1.67×10^{-27} kg

(c) 9.1×10^{-31} kg **(d)** None of these

92. The reverse process of photo-electric effect is called:

(a) Annihilation of matter **(b)** Compton effect

(c) Pair production **(d)** X-rays

93. The transitions of inner shell electrons in heavy atoms give rise to the emission of:

(a) High energy photon or x-rays **(b)** High energy γ-rays

(c) Low energy photons or x-rays **(d)** High energy β-rays

94. Laser is device which can produce:

(a) Coherent beam of light **(b)** Monochromatic beam of light

(c) An intense beam of light **(d)** All of above

95. The idea of laser was introduced by:

(a) C.H. Townes and Arthur L Schaw Law **(b)** Dr. Grattling

(c) Frank whittle **(d)** Dr. C-gilbert young

96. The duration of a laser pulse is 10^{-8} see. The uncertainty in its energy will be:

(a) $\Delta E = \frac{h}{\Delta t}$ **(b)** $\Delta E = h\,\Delta t$

(c) $\Delta E = \frac{\Delta t}{h}$ **(d)** None of these

97. The duration of a laser pulse is 10^{-8} see. The uncertainty in its energy will be:

(a) 10.500×10^{-26} J **(b)** 6.625×10^{-28} J

(c) 6.625×10^{-26} J **(d)** 1.050×10^{-28} J

98. Different types of lasers are:

(a) Two **(b)** Three

(c) Five **(d)** None of these

99. Characteristic x-rays are produced from:

(a) Heavy element **(b)** Light element

(c) Inner shell **(d)** Both (a) and (b)

100. An atom can reside in excited state for:

(a) 10^{-8} second **(b)** One second

(c) 10^{-10} second **(d)** More than one second

101. The process by which lesser beam can be used to generate 3- dimensional images of objects is called:

(a) Holography **(b)** Geo graphy

(c) Tomography **(d)** Radio graphy

102. In the production of laser beam for each incident photon, we will have two photons going:

(a) In the same direction **(b)** In opposite direction

(c) At right angle to each other **(d)** In arbitrary direction

103. The velocity of laser light is:

(a) Less than ordinary light **(b)** More than ordinary light

(c) Equal to ordinary light **(d)** None of these

104. Reflecting mirrors in laser is used to:

(a) Further stimulation **(b)** For producing more energetic lasers

(c) Both (a) and (b) **(d)** None of these

105. In He-Ne laser, the laser action is produced by:

(a) Ne only **(b)** He-Ne both

(c) Electrons of He **(d)** Electrons of Ne

106. Most commonly used type of gas laser is:

(a) Helium-Neon **(b)** Carbon dioxide

(c) Argon ion **(d)** All of above

107. The excited atoms returns to their ground state in:

(a) 10^{-10} sec **(b)** 10^{-8} sec

(c) 10^{-6} sec **(d)** 10^{-11} sec

108. Life time of metastable states is:

(a) 10^{-6} sec or more **(b)** 10^{-3} sec or more

(c) 10^{-5} sec or more **(d)** None of these

109. Operation of a laser depends upon:

(a) The existence of atoms in metastable state **(b)** The existence of atoms in ground state

(c) The existence of atoms in excited state **(d)** None of these

110. Laser beam can be used to generate three dimensional images of object in a process called:

(a) Holography **(b)** Tomography

(c) None of these

111. Helium-Neon laser discharge tube contains neon:

(a) 82% **(b)** 15%

(c) 25% **(d)** 85%

112. The idea of laser device was first introduced by C.H. Townes and Authers Schowlan is:

(a) 1972 **(b)** 1965

(c) 1958 **(d)** 1913

113. Laser can be made by creating:

(a) Population inversion **(b)** Metastable state

(c) Assembly **(d)** All of the above

114. For production of X-rays, the target must be of:

(a) High melting point **(b)** Low melting point

(c) Very hard **(d)** None of these

115. What is speed of electron in the first Bohr orbit?

(a) 2.19×10^{6} m/s **(b)** 1.6×10^{6} m/s

(c) 2.2×10^{-6} m/s **(d)** 3×10^{8} m/s

116. The branch of Physics in which laser is studied:

(a) Optics **(b)** Photonics

(c) Plasma **(d)** None

117. For shortest wavelength radiation in the Balmer series, the value of n is:

(a) 2 **(b)** 3

(c) Infinity **(d)** 5

ANSWERS

1.	(b)	**2.**	(d)	**3.**	(a)	**4.**	(d)	**5.**	(d)
6.	(a)	**7.**	(b)	**8.**	(c)	**9.**	(a)	**10.**	(d)
11.	(a)	**12.**	(c)	**13.**	(d)	**14.**	(a)	**15.**	(d)
16.	(d)	**17.**	(d)	**18.**	(b)	**19.**	(a)	**20.**	(a)
21.	(c)	**22.**	(d)	**23.**	(c)	**24.**	(b)	**25.**	(d)
26.	(a)	**27.**	(c)	**28.**	(a)	**29.**	(b)	**30.**	(a)
31.	(a)	**32.**	(b)	**33.**	(b)	**34.**	(c)	**35.**	(b)
36.	(c)	**37.**	(d)	**38.**	(b)	**39.**	(b)	**40.**	(b)
41.	(a)	**42.**	(c)	**43.**	(b)	**44.**	(a)	**45.**	(c)
46.	(a)	**47.**	(c)	**48.**	(d)	**49.**	(a)	**50.**	(d)
51.	(c)	**52.**	(c)	**53.**	(a)	**54.**	(b)	**55.**	(a)
56.	(b)	**57.**	(c)	**58.**	(d)	**59.**	(b)	**60.**	(a)
61.	(a)	**62.**	(a)	**63.**	(b)	**64.**	(c)	**65.**	(a)
66.	(a)	**67.**	(d)	**68.**	(c)	**69.**	(a)	**70.**	(d)
71.	(b)	**72.**	(a)	**73.**	(d)	**74.**	(b)	**75.**	(c)
76.	(d)	**77.**	(b)	**78.**	(a)	**79.**	(c)	**80.**	(b)
81.	(a)	**82.**	(c)	**83.**	(a)	**84.**	(b)	**85.**	(c)
86.	(a)	**87.**	(d)	**88.**	(d)	**89.**	(d)	**90.**	(d)
91.	(a)	**92.**	(d)	**93.**	(a)	**94.**	(d)	**95.**	(a)
96.	(a)	**97.**	(c)	**98.**	(b)	**99.**	(d)	**100.**	(a)
101.	(a)	**102.**	(b)	**103.**	(c)	**104.**	(a)	**105.**	(a)
106.	(d)	**107.**	(b)	**108.**	(b)	**109.**	(a)	**110.**	(a)
111.	(b)	**112.**	(c)	**113.**	(d)	**114.**	(a)	**115.**	(a)
116.	(b)	**117.**	(c)						

NUCLEAR PHYSICS

Each question has four possible answers, tick (✓) the correct answer:

1. Atomic theory was announced in 1808 by:

(a) Einstein **(b)** Dalton

(c) Newton **(d)** J.J. Thomson

2. By passing an electric discharge through a gas at low pressure, the electron was discovered:

(a) Millikan **(b)** Chadwick

(c) Bohr **(d)** J.J. Thomson

3. Charge on an electron was determined by:

(a) Ampere **(b)** Millikan

(c) Maxwell **(d)** Bohr

4. The early Greeks believed that matter waves was:

(a) Discrete **(b)** Continuous

(c) Both continuous and discrete **(d)** All of above

5. The electron was discovered by J.J Thomson by passing an electric discharge through:

(a) A liquid **(b)** A solid

(c) A gas at low pressure **(d)** A gas at high pressure

6. The charge on electron was experimentally determined by Millikan in:

(a) 1895 **(b)** 1916

(c) 1905 **(d)** 1909

7. Structure of Nucleus successfully explained by:

(a) Bohr **(b)** Millikan

(c) J.J. Thomson **(d)** Rutherford

8. Rutherford determined the size of nucleus to be equal to:

(a) 10^{-10} m **(b)** 10^{-13} m

(c) 10^{-16} m **(d)** 10^{-14} m

9. Proton was discovered by Rutherford in:

(a) 1917 **(b)** 1920

(c) 1910 **(d)** 1915

10. Chadwick discovered neutron by the study of scattering of α-particles from:

(a) Nitrogen **(b)** Oxygen

(c) Gold foil **(d)** Beryllium

11. Neutrons and protons in the Nucleus are together called:

(a) Nucleons **(b)** Atomic particles

(c) Photons **(d)** Phenons

12. In the unit of unified mass scale, The mass of an electron is:

(a) 0.000554 u **(b)** 0.0000554 u

(c) 1,007276 u **(d)** 1.0086654 u

13. Unified mass scale means that atomic mass is expressed in:

(a) Kilogram **(b)** Gram

(c) U only **(d)** Atomic mass unit

14. The particle which is 7000 times heavier than the electron is called:

(a) β-particle **(b)** R.ray

(c) α-Particle **(d)** Proton

15. The Isotopes of hydrogen are:

(a) Protium **(b)** Deutrium

(c) Tritium **(d)** All

16. The ratio of the mass of nucleus and the total mass of all the constituents making the nucleus is always:

(a) Grater than one **(b)** Equal to one

(c) Less than one **(d)** None of these

17. The energy required to breaks up helium nuclear into two protons and two neutron is:

(a) 28.2 eV **(b)** 28.2 Kev

(c) 28.2 Mev **(d)** 28.2 μev

18. A large amount of energy can be obtained when:

(a) Fission takes palace **(b)** A heavy element breakup in to lighter element

(c) Both (a) and (b) **(d)** None of these

19. A particle having the mass of an electron and the charge of a proton is called a:

(a) Photon **(b)** Nucleons

(c) Positron **(d)** Antiproton

20. Charge on Neutron is:

(a) Zero **(b)** $+1.6 \times 10^{-19}$ c

(c) -1.6×10^{-19} c **(d)** None of above

21. Mass of proton is:

(a) 1.67×10^{-27} kg **(b)** 9.1×10^{-31} kg

(c) 1.67×10^{-17} kg **(d)** 2.1×10^{-27} kg

22. Mass of electron is:

(a) 1.67×10^{-27} kg **(b)** 9.1×10^{-31} kg

(c) 1.67×10^{-17} kg **(d)** 2.1×10^{-27} kg

23. Charge on an electron is:

(a) $+1.6 \times 10^{-19}$ c **(b)** -1.6×10^{-19} c

(c) 2.1×10^{-19} c **(d)** None of above

24. 1 amu is equal to:

(a) 1.0606×10^{-27} kg **(b)** 1.66×10^{-31} kg

(c) 1.66×10^{-34} kg **(d)** 1.66×10^{-19} kg

25. Atoms of an element whose atomic number are the same but have different mass numbers are called:

(a) Isomers **(b)** Isotones

(c) Isotopes **(d)** None of these

26. The mass number of a nucleus is the number of:

(a) Positive particle nucleus **(b)** Neutrons in the nucleus

(c) Nucleons in the nucleus **(d)** Protons in the nucleus

27. An apparatus used to determine the masses of protons, nuclei, ions and to detect the isotopes is:

(a) Mass spectrograph **(b)** Dosimeter

(c) Geiger counter **(d)** None of these

28. For an atom having atomic mass A and atomic number Z, the number of neutrons in the nucleus is:

(a) A + Z **(b)** A – Z

(c) Z **(d)** None of these

29. The chemical behaviour of an atom is determined by:

(a) Number of isotopes **(b)** Atomic number

(c) Mass number **(d)** None of these

30. The amount of energy required to break the nucleus is called its:

(a) Binding energy **(b)** Potential and kinetic energy

(c) Atomic energy **(d)** Nuclear energy

31. The average amount of energy to remove one nucleon from the nucleus is called:

(a) Nuclear energy **(b)** Binding energy

(c) Binding energy per nucleon **(d)** None of above

32. Mass defect per nucleon is called:

(a) Average energy of nucleon **(b)** Binding energy of nucleus

(c) Packing fraction **(d)** None of these

33. The binding energy of deutron is:

(a) 22.22 Mev **(b)** 2.224 Mev

(c) 0.224 Mev **(d)** 20.2 Mev

34. Radio activity was discovered by:

(a) Rutherford **(b)** Einstein

(c) H-Becqueral **(d)** Bohr

35. A naturally occurring disintegration involving the emission of high energy electron is called:

(a) α-decay **(b)** β-decay

(c) γ-decay **(d)** None of these

36. When a nucleus emits an α-particle, its mass number drops by:

(a) 1 **(b)** 3

(c) 2 **(d)** 4

37. The interaction of different radiation with matter depends upon:

(a) Mass of interacting particle **(b)** Charge

(c) Energy **(d)** All of above

38. Artificial radio activity is:

(a) Unstable to unstable element **(b)** Stable to stable element

(c) Unstable to stable element **(d)** Stable to unstable element

39. Radioactivity happen due to the disintegration of:

(a) Nucleus **(b)** Mass

(c) Electrons **(d)** Protons

40. Which of the following have similar nature as that of electrons:

(a) β-rays **(b)** γ-rays

(c) α-rays **(d)** X-rays

41. Artificial radioactivity was discovered by:

(a) Rutherford **(b)** Roentgen

(c) Marie curie and Pierre Currie **(d)** Henry Bacquerel

42. Marie curie and Pierre curie discovered two new radioactive elements which are:

(a) Polonium and radium **(b)** Radium and crypton

(c) Platinum and radium **(d)** Uranium and radium

43. When α-particle is emitted out of the nucleus then the mass number of the nucleus decreases by:

(a) 4 **(b)** 3

(c) 2 **(d)** 1

44. The mass and charge of an α-particle is:

(a) 2u and + 4e **(b)** 4u and + 2e

(c) 2u and + 2e **(d)** 4u and + 4e

45. The wavelength of γ-rays is:

(a) Greater than that of x-rays **(b)** Equal to that of x-ray

(c) Shorter than that of x-rays **(d)** None of these

46. γ-radiation:

(a) has no mass **(b)** has no energy

(c) is a proton **(d)** All of the above

47. When α-particle emitted out of the nucleus then charge number of the nucleus decreased by:

(a) 4 **(b)** 3

(c) 2 **(d)** 1

48. The distance at which the radioactive particle comes to rest after emitting from a source is called:

(a) Stopping distance **(b)** Range

(c) Distance **(d)** All of above

49. Which of the reaction shows the emission of β-particle:

(a) ${}_{Z}X^{A} \longrightarrow {}_{Z-1}X^{A-4}$ **(b)** ${}_{Z}X^{A} \longrightarrow {}_{Z+1}X^{A}$

(c) ${}_{Z}X^{A} \longrightarrow {}_{Z-2}X^{A-4}$ **(d)** None of these

50. Which of the reaction shows the emission of α-particles:

(a) ${}_{Z}X^{A} \longrightarrow {}_{Z-1}X^{A-4}$ **(b)** ${}_{Z}X^{A} \longrightarrow {}_{Z+1}X^{A}$

(c) ${}_{Z}X^{A} \longrightarrow {}_{Z-2}X^{A-4}$ **(d)** None of these

51. Which one of the following is not affected by electric or magnetic field:

(a) Proton **(b)** Electrons

(c) γ-rays **(d)** x-rays

52. The half life of radioactive elements depends upon:

(a) Nature of element **(b)** Amount of radioactive substance

(c) Magnetic field **(d)** None of these

53. The radioactive decay obeys the law:

(a) $N = N_o e^{\lambda t}$ **(b)** $N = N_o e^{-\lambda t}$

(c) $N_o = N e^{-\lambda t}$ **(d)** $N_o = N (1 + e^{-\lambda t})$

54. The rate of decay of radioactive substance:

(a) Varies inversely with time **(b)** Decreases with time

(c) Constant **(d)** Decreases exponentially with time

55. The time taken for a radioactive element to decay to half of its original number of atoms is called:

(a) Half life of the material **(b)** Decay life of the material

(c) Average life of material **(d)** None of these

56. The half life of a radioactive element is given by:

(a) $T_{1/2} = 0.693/\lambda$ **(b)** $T_{1/2} = 0.603\lambda$

(c) $T_{1/2} = 0.693\lambda$ **(d)** $T_{1/2} = 0.603/\lambda$

57. The reciprocal of decay constant (λ) of a radioactive element is:

(a) Average life **(b)** Half life

(c) Mean life **(d)** None of these

58. The SI unit of decay constant is:

(a) m **(b)** m^{-1}

(c) S^{-1} **(d)** Nm^{-1}

59. If we have No number of atoms of any radioactive element, then after 4 half life's, the number of atoms left behind are:

(a) $\frac{1}{16}$ No **(b)** $\frac{1}{4}$ No

(c) $\frac{1}{8}$ No **(d)** None of these

60 The half life of uranium^{-238} is:

(a) 4.5×10^9 years **(b)** 3.8 days

(c) 1620 years **(d)** 23.5 minutes

61. The half life of radium –225 is:

(a) 4.5×10^9 years **(b)** 3.8 days

(c) 1620 years **(d)** 23.5 minutes

62. Rate of decay is actually described by:

(a) Half life **(b)** Decay constant

(c) Mean life **(d)** None of these

63. When a certain radiation passes through matters it lose energy due to:

(a) Ionization of material atoms sue to direct collision

(b) Ionization of material atoms due to electrostatic attraction

(c) Excitation of material atoms

(d) Any of these

64. The magnitude of range of radiation particle through matter depends upon:

(a) Its mass and charge **(b)** Its charge

(c) Its mass and charge **(d)** all of the above

65. The intensity I_o of a beam after passing through:

(a) $I = I_o e^{-\mu x}$ **(b)** $I = I_o x$

(c) $I = I_1 e^{\mu x}$ **(d)** $I = I_o x^2$

66. In equation $I = I_o e^{-\mu x}$, the symbol μ represents:

(a) Radiation coefficient **(b)** Absorption coefficient

(c) Emission coefficient **(d)** Material coefficient

67. The process in which a heavy nucleus is broken into two lighter nuclei with the release of energy in called:

(a) Nuclear fusion **(b)** Nuclear fission

(c) Chain reaction **(d)** None of these

68. Nuclear fission reaction can be produced in $_{92}U^{238}$ by:

(a) Slow neutrons **(b)** Fast neutrons

(c) Thermal neutrons **(d)** None of these

69. The product of the fission reaction of uranium named barium and krypton have a total mass equal to:

(a) 1.96 Mev **(b)** 0.67 Mev

(c) 0.9 Mev **(d)** 0.97 Mev

70. The chain reaction is controlled by a series of rods usually made of:

(a) Cadmium **(b)** Uranium

(c) Iron **(d)** Boron

71. The nuclear fission reaction is given by the following reaction:

(a) $_{92}U^{235} + {}_{0}n^{1} \longrightarrow {}_{56}B_{a}^{144} + {}_{36}kr^{92} + 3{}_{0}n^{1}$ **(b)** $_{1}H^{2} + {}_{1}H^{2} \longrightarrow {}_{2}He^{4} + Q$

(c) $_{7}N^{14} + {}_{0}n^{1} \longrightarrow {}_{6}C^{12} + {}_{1}H^{3}$ **(d)** None of these

72. Energy emitted when one atom of $_{92}U^{235}$ undergoes fission reaction is:

(a) 150 Mev **(b)** 70 Mev

(c) 200 Mev **(d)** 300 Mev

73. The process of nuclear fission was explained by:

(a) Lies Meitner **(b)** Stressman and Hann

(c) Bohr and Hahn **(d)** None of these

74. During fission process, a large amount of:

(a) Light energy is produced **(b)** Heat energy is released

(c) Nuclear energy is released **(d)** None of these

75. The energy released during fission process is controlled in:

(a) Nuclear reactor **(b)** Cyclotron

(c) Van de Graff generator **(d)** None of these

76. The moderator used in a nuclear reactor is:

(a) Uranium **(b)** Sodium

(c) Aluminum **(d)** Graphite

77. The first atomic reactor was introduced by:

(a) Currie **(b)** Enrico Fermi

(c) Newton **(d)** Bohr

78. The total energy transferred to a body by means of radiation is measured is units of:

(a) Rontgens **(b)** Rutherford's

(c) Curies **(d)** None of these

79. The mass of fissionable material needed for self sustaining chain reaction is called:

(a) Atomic mass **(b)** Critical mass

(c) Sub critical mass **(d)** None of these

80. Uranium bomb depends on the process of:

(a) Nuclear Fission **(b)** Nuclear Fusion

(c) Pair production **(d)** All of above

81. The first artificially produced nuclear transmutation was studied by:

(a) Chadwick **(b)** Rutherford

(c) Faraday **(d)** None of these

82. The process in which two or more lighter nuclei combine together to form heavier nuclei with release of energy is called:

(a) Nuclear fission **(b)** Nuclear fusion

(c) Chain reaction **(d)** None of these

83. The main source of energy in the stars and the sun is due to:

(a) Fission reaction **(b)** Fusion reaction

(c) Chemical reaction **(d)** None of above

84. The substances which slow down the speed of neutron produced during a fission reaction are called:

(a) Moderators **(b)** Retardants

(c) Both (a) and (b) **(d)** None of these

85. Examples of radiation detector case:

(a) Gorger counter **(b)** Wilson cloud chamber

(c) Solid state detector **(d)** All of the above

86. Certain radiation detector makes use of the fact that super saturated vapors condense preferentially on ions this type of detector is called:

(a) Gorger counter **(b)** Wilson cloud chamber

(c) Solid state detector **(d)** None of these

87. In Wilson cloud chamber x-particle leave:

(a) Thick and continuous **(b)** Thin and discontinuous

(c) Thick and discontinuous **(d)** Thin and continuous

88. In Wilson cloud chamber, β-particles leave:

(a) Thin and continuous tracks **(b)** Thick and continuous tracks

(c) No tracks **(d)** Thin and discontinuous tracks

89. In G.M, counter, the cylinder is dilled with mixture of gases:

(a) Containing Ne and Br **(b)** Containing organ and alcohol

(c) Both (a) and (b) **(d)** None of these

90. To allow the entry of α or β-particles, one end of the Geiger counter tube vas a:

(a) Thin glass window **(b)** Thin mica window

(c) Wooden window **(d)** None of these

91. The counter which also provide the power to the G.M tube is called:

(a) Chamber **(b)** Amplifier

(c) Scalar **(d)** Vector

92. The term "dead time" in G.M counter means the time or the order of:

(a) More than 1 millisec **(b)** Less than 1 millisec

(c) More than 1 millisec **(d)** None of these

93. In solid-state detector, the reverse bias is applied through the two:

(a) Conducting layers of silver **(b)** Conducting layers of gold

(c) Conducting layers of aluminum **(d)** Conducting layers of plastic

94. In sold state detector, the energy needed to produce an electron hole pair is about:

(a) 3Mev to 4Mev **(b)** 3ev to 4Mev

(c) Both (a) and (b) **(d)** None of these

95. The phenomenon of nuclear fission is used in the construction of:

(a) Atomic bombs **(b)** Hydrogen bomb

(c) Both (a) and (b) **(d)** None of these

96. In fission reaction, heavy water is used as:

(a) Heat exchanger **(b)** Coolant

(c) Moderator **(d)** None of above

97. The Wilson cloud chamber is based on the principle that supper saturated vapors condense more readily on:

(a) Ions and dust particles **(b)** Dust particles

(c) Ions **(d)** None of these

98. Wilson cloud chamber is a device used as:

(a) Path of ionizing particle **(b)** Accelerating +vely charged particle

(c) Accelerating –vely charged particle **(d)** None of these

99. In Wilson Cloud chamber, the β-particle leave:

(a) Thin and discontinous tracks **(b)** No tracks

(c) Thick and continuous tracks **(d)** None of these

100. In Wilson Cloud chamber, the α-particle leave:

(a) Thin and discontinuous tracks **(b)** No tracks

(c) Thick, straight and continuous tracks **(d)** None of these

101. Geiger counter was designed by:

(a) Mosely **(b)** Michelson

(c) Geiger and Muller **(d)** Faraday

102. Geiger Muller counter is suitable for:

(a) Slow counting **(b)** Fast counting

(c) Both (a) and (b) **(d)** None of these

103. Geiger Muller counter is widely used:

(a) Radioactivity experiments **(b)** Electrical experiments

(c) Both (a) and (b) **(d)** None of these

104. Specially designed solid state detector can be used to detect:

(a) γ-rays **(b)** X-rays

(c) α-particles **(d)** β-particles

105. A solid state detector is basically:

(a) A p-n-p transistor **(b)** A n-p-n transistor

(c) A reverse p-n junction **(d)** A forward p-n-junction

106. The potential difference between the top and bottom of a cloud chamber is of the order of:

(a) 290 v **(b)** 400 v

(c) 1 kv **(d)** None of above

107. The potential difference between anode and cathode in a neon-bromine filled G.M counter is:

(a) 290 v **(b)** 400 v

(c) 1 kv **(d)** 1 MV

108. Which one of the following detectors can count fast and operate at low voltage:

(a) Solid state detector **(b)** G.M counter

(c) Wilson cloud chamber **(d)** None of these

109. In G.M counter, the electrons take time to reach the anode is:

(a) 1 μs **(b)** 10^{-6} μs

(c) 2 μc **(d)** None of these

110. In G.M counter, the positive ions take time to reach the cathode is:

(a) 10^{-2} s **(b)** 10^{-3} μs

(c) 10^{-4}s **(d)** 10^{-6} s

111. The capture of a neutron by a nucleus results in the formation of:

(a) Deutron **(b)** Proton

(c) Helium **(d)** Radio Isotope

112. One mass scale 1u is equal to:

(a) 1.66×10^{18} kg **(b)** 1.66×10^{-19} kg

(c) 1.66×10^{-27} kg **(d)** 1.66×10^{27} kg

113. One joule of energy absorbed per kilogram of a body is:

(a) Roentgen **(b)** Grey

(c) Rem **(d)** Curie

114. The total energy transferred to a body by means of radiation is measured in units of:

(a) Becquerels **(b)** Grey

(c) Rem **(d)** Roentgen

115. The SI unit of radiation dose is:

(a) Roentgen **(b)** Curie

(c) Grey **(d)** Rem

116. The number of fundamental forces present in nature are:

(a) 3 **(b)** 2

(c) 5 **(d)** 4

117. During fusion of hydrogen into helium:

(a) Energy is released

(b) Energy is absorbed

(c) Mass is increased due to energy absorption

(d) Mass is reduced due to energy released

118. A pair of quark and anti quark makes a:

(a) Meson **(b)** Bargon

(c) Photon **(d)** Proton

119. The mass spectrum of naturally occurring neon, showing:

(a) 1 isotope **(b)** 2 isotope

(c) 3 isotope **(d)** 4 isotope

120. The energy of photon for photoelectric effect is less than:

(a) 1 MeV **(b)** 2 MeV

(c) 5 MeV **(d)** 8 MeV

121. In Wilson cloud chamber, if tracks are thick, straight and continuous, then particle is:

(a) α-particles **(b)** β-particles

(c) γ-rays **(d)** All

122. Low level radiations effects:

(a) Less of hair **(b)** Ulceration

(c) Drop of white blood cells **(d)** All

ANSWERS

1.	(b)	**2.**	(d)	**3.**	(b)	**4.**	(a)	**5.**	(c)
6.	(d)	**7.**	(d)	**8.**	(d)	**9.**	(a)	**10.**	(d)
11.	(a)	**12.**	(a)	**13.**	(d)	**14.**	(c)	**15.**	(d)
16.	(b)	**17.**	(c)	**18.**	(c)	**19.**	(c)	**20.**	(a)
21.	(a)	**22.**	(b)	**23.**	(b)	**24.**	(a)	**25.**	(c)
26.	(c)	**27.**	(a)	**28.**	(b)	**29.**	(a)	**30.**	(a)
31.	(c)	**32.**	(b)	**33.**	(b)	**34.**	(c)	**35.**	(b)
36.	(c)	**37.**	(d)	**38.**	(d)	**39.**	(a)	**40.**	(a)
41.	(d)	**42.**	(a)	**43.**	(c)	**44.**	(b)	**45.**	(c)
46.	(d)	**47.**	(c)	**48.**	(b)	**49.**	(b)	**50.**	(c)
51.	(c)	**52.**	(b)	**53.**	(b)	**54.**	(d)	**55.**	(a)
56.	(a)	**57.**	(c)	**58.**	(b)	**59.**	(a)	**60.**	(a)
61.	(c)	**62.**	(b)	**63.**	(d)	**64.**	(d)	**65.**	(a)
66.	(b)	**67.**	(b)	**68.**	(b)	**69.**	(c)	**70.**	(a)
71.	(a)	**72.**	(c)	**73.**	(b)	**74.**	(c)	**75.**	(a)
76.	(d)	**77.**	(b)	**78.**	(a)	**79.**	(b)	**80.**	(a)
81.	(b)	**82.**	(b)	**83.**	(b)	**84.**	(a)	**85.**	(d)
86.	(b)	**87.**	(a)	**88.**	(d)	**89.**	(c)	**90.**	(b)
91.	(c)	**92.**	(a)	**93.**	(b)	**94.**	(b)	**95.**	(b)
96.	(c)	**97.**	(a)	**98.**	(a)	**99.**	(a)	**100.**	(c)
101.	(c)	**102.**	(a)	**103.**	(a)	**104.**	(a)	**105.**	(c)
106.	(c)	**107.**	(b)	**108.**	(c)	**109.**	(a)	**110.**	(b)
111.	(d)	**112.**	(c)	**113.**	(b)	**114.**	(d)	**115.**	(c)
116.	(d)	**117.**	(a)	**118.**	(a)	**119.**	(c)	**120.**	(c)
121.	(a)	**122.**	(d)						