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Class: 12 **Subject:- Physics (MCQ's)(2025-26)** **M.M.-200**

NAME_____ **ROLL NO**_____ **STREAM**_____

1. What is the net electrostatic field in the interior of a conductor?

a) Positive b) Negative c) Zero d) Depends on the nature of the conductor

2. What is the total work done on moving a test charge on an equipotential surface?

a) Maximum b) Minimum c) Constant d) Zero

3. What happens to the force acting between the charged particles, if the distance between these charged particles is halved?

(a) It increases by four times (b) It gets doubled (c) It becomes half (d) It reduces by one-fourth

4. The capacity of parallel plate condenser is dependent on the

(a) The separation between the plates (b) The metal used for the construction

(c) The thickness of the plate (d) The potential applied across the plates

5. What does an electric dipole experience when it is kept in the non-uniform electric field?

(a) Only a force (b) Only torque (c) Force and torque both (d) Neither force nor torque

6. There are infinite number of charges, each equal to 'q', which are placed along the X-axis at points x = 1, x = 4, x = 16, x = 64……..Then, determine the electric potential due to this system of charges at the point x = 0.

a) $V=16q/3\pi\varepsilon_o$ b) $V=3q/4\pi\varepsilon_o$ c) $V=4q/8\pi\varepsilon_o$ d) $V=3q/16\pi\varepsilon_o$

7. Two equal and opposite charges Q1 = 2 C and Q2 = -2C are placed at a distance of 6m from each other. What is the potential at the midpoint between the two charges?

a) 2 V b) 0 V c) 1 V d) 3 V

8. Two isolated metallic spheres, one with a radius R and another with a radius 5R, each carries a charge 'q' uniformly distributed over the entire surface. Which sphere stores more electric potential energy?

a) The sphere with radius 5R b) Both of the spheres will have the same energy

c) The sphere with radius R d) None of these

9. There are two charges → Q1 = +q and charge Q2 = +2q. From the initial point (Q), Q1 is at a distance of r and Q2 is at a distance 2r. Which charge (Q1 or Q2) will have higher electrostatic potential energy?

a) Q1 b) Both will have the same energy c) Q2 d) The information given is not enough

10. Identify the dimension of electrostatic potential energy from the following.

a) $ML^2T^{-3}A^{-2}$ b) $ML^3T^{-2}A^{-1}$ c) $M^{-1}L^2T^{-3}A$ d) $ML^2T^{-3}A^{-1}$

11. An electric dipole will be in stable equilibrium if the angle between the axis of the dipole and the electric field is _____

a) 0 degree b) 180 degree c) 90 degree d) 45 degree

12. Three equal positive charges are kept at the corners of an equilateral triangle. What will be the vector sum of the forces acting on the particles?

a) Directed towards the centre b) Directed radially outside

c) Acts along one of the sides of the triangle d) Zero

13. Which among the following is false?

a) Coulomb force is a central force

b) The force between two charges depends on the medium between them

c) Coulomb force is a weak force

d) The net force on a charge is the vector sum of the forces acting on it due to several other charges

14. Gold-leaf electroscope can be used _____

a) Only to detect the presence of charge

b) To detect the presence of charge as well as its nature (positive or negative)

c) To measure the surface charge density d) To measure current

15. In which type of molecule positive and negative charges coincides with each other?

a) Polar b) Unipolar c) non-polar d) Bipolar

16. What is the induced dipole moment developed per unit volume of a dielectric when placed in an external electric field called?

a) Relative permittivity b) Polarisation susceptibility c) Electric susceptibility d) Polarisation density

17. Electric field due to a uniformly charged hollow sphere at a distance of r (where r is greater than the radius of the sphere) is _____

a) Proportional to r b) Inversely proportional to r c) Proportional to r^2 d) Inversely proportional to r^2

18. Two point charges +4q and +q are kept at a distance of 30 cm from each other. At which point between them, the field intensity will be equal to zero?

a) 15 cm away from the +4q charge b) 20 cm away from the +4q charge

c) 7.5 cm away from the +q charge d) 5 cm away from the +q charge

19. What is the dimension of electric field intensity?

a) $[M\ L\ T^{-2}\ I^{-1}]$ b) $[M\ L\ T^{-3}\ I^{-1}]$ c) $[M\ L\ T^{-2}\ I^{-2}]$ d) $[M\ L\ T^{-3}\ I]$

20. Electric field intensity at the centre of a square is _____ if +20 esu charges are placed at each corner of the square having side-length as 10 cm.

a) 0 b) 0.4 dyne/esu c) 2 dyne/esu d) 1.6 dyne/esu

21. Find the electric field intensity at 10cm away from a point charge of 100 esu.

a) 1 dyne/esu b) 10 dyne/esu c) 100 dyne/esu d) 1000 dyne/esu

22. Which among the following is false about electric field lines?

a) They are continuous b) They attract each other

c) They remain parallel in a uniform electric field d) They diverge from positive charge

23. If a positive test charge is placed in an electric field, in which direction will it move?

a) Opposite the field b) Perpendicular to the field c) In the direction of the field d) In a circular path

24. What happens to electric potential energy when two like charges are brought closer together?

a) It decreases b) It stays the same c) It becomes negative d) It increases

25. By performing a set of experiments, a scientist found that the electric field between two points A and B is zero. What can he conclude regarding the potential of the two points?

a) $V_A = 0, V_B = 0$ b) $V_A > V_B$ c) $V_A < V_B$ d) $V_A = V_B$

26. What is the number of electrons that constitutes a current of one Ampere?

a) 2.25×10^{18} b) 2.25×10^{-18} c) 6.25×10^{18} d) 6.25×10^{-18}

27. Give the number of electrons passing through a wire per minute. The current flowing through it is 500mA.

a) 1.875×10^{20} b) 6.875×10^{20} c) 1.875×10^{-20} d) 6.875×10^{-20}

28. Identify the dimensional formula of electric current.

a) $[M\ L\ T^{-2}]$ b) $[M^0\ L^0\ T^0\ A^1]$ c) $[M\ L^3\ T^0]$ d) $[M\ L^2\ T^{-3}]$

29. What is the SI unit of mobility?

a) Vm^{-1} b) $m^2V^{-1}s^{-1}$ c) mV^{-2} d) $m^2V^{-2}s^{-1}$

30. Consider a conductor of length 0.5 m. A potential difference of 20V is applied across this conductor. If the drift velocity of electrons is given as $5.0 \times 10^{-4} ms^{-1}$, then determine the mobility of the electrons.

a) $5.25 \times 10^{18} m^2V^{-1}s^{-1}$ b) $5.25 \times 10^{-18} m^2V^{-1}s^{-1}$ c) $1.25 \times 10^{-5}\ m^2V^{-1}s^{-1}$ d) $1.25 \times 10^{6} m^2V^{-1}s^{-1}$

31. Calculate the drift velocity of free electrons if a current of 5 A is maintained in a conductor of cross-section $10^{-2} m^2$. The number density of free electrons is $5 \times 10^{20} m^{-3}$.

a) $6.25\ ms^{-1}$ b) $5.25\ ms^{-1}$ c) $2.25\ ms^{-1}$ d) $12.25\ ms^{-1}$

32. Identify the material which is suitable for making standard resistors.

a) Silver b) Copper c) Constantan d) Germanium

33. A wire has a resistance of 5.5 Ω at 19°C and 21.5 Ω at 200°C. Find the temperature coefficient of resistivity(α) of the material.

a) $0.016\ ^oC^{-1}$ b) $0.160\ ^oC^{-1}$ c) $1.600\ ^oC^{-1}$ d) $16.00\ ^oC^{-1}$

34. Which of the following is the correct statement regarding electrochemical cell?

a) It converts chemical energy to electrical energy b) It converts electric energy to chemical energy

c) It converts chemical energy to thermal energy d) It does not maintain the flow of charge in a circuit

35. Which is the factor that internal resistance does not depend on?

a) Distance between the electrodes b) Temperature of the electrolyte

c) Nature of electrode and electrolyte d) Area of the electrode, immersed in the electrolyte

36. A current of 3 A passes through an electric circuit for 5 minutes and does a work of 900J. What is the emf of the source?

a) 3V b) 1V c) 5V d) 10V

37. A cell has an emf of 6V, internal resistance of 1 ohm and a current of 0.5 A passing through it. This cell is connected to a resistor. Find out the resistance of the resistor.

a) 10 ohms b) 11 ohms c) 12 ohms d) 13 ohms

38. Which instrument is used as the null detector in the Wheatstone bridge?

a) Voltmeter b) Ammeter c) Galvanometer d) Multimeter

39. Sensitivity is defined as _____

a) amount of voltage per unit current b) amount of power per unit voltage

c) amount of resistance per unit voltage d) amount of deflection per unit current

40. What is the relation between the sensitivity and deflection for a galvanometer?

a) directly proportional b) inversely proportional

c) independent of each other d) depends on the type of galvanometer used

41. Which of the following is correct when one cell is wrongly connected in series circuit?

a) The total emf reduces by e b) The total emf increases by e

c) The total emf increases by 2e d) The total emf decreases by 2e

42. Calculate the number of dry cells, each of emf 2V and internal resistance 1V that is joined in series with a resistance of 30 ohms so that a current of 0.8A passes through it.

a) 20 b) 10 c) 30 d) 40

43. There are 4 resistors, each having the same resistance of 4 ohms. These are first connected in series with a cell of internal resistance 2 ohms. Then, they are connected in parallel to the same cell. Find the ratio of the respective currents in the two cases.

a) 1:8 b) 1:7 c) 1:6 d) 6:1

44. 'n' cells have emf 'e' and internal resistance 'r' and connected to an external resistance 'R'. They pass the same current whether the cells are connected in series or in parallel to each other. Then which of the following conditions are true?

a) R = r b) r = nR c) R = nr d) $R = n^2r$

45. A battery of emf 10V has an internal resistance of 1 ohms and is charged by a 150V dc supply using a series resistance of 19 ohms. What is the terminal voltage of the battery?

a) 15V b) 20V c) 17V d) 25V

46. What is the equivalent resistance of series combination of 3 resistors?

a) $R_s = R_1 + R_2 + R_3$ b) $R_s = 1/(R1+R2+R3)$ c) $R_s = 1/R1+1/R2+1/R3$ d) $R_s = (R1+R2)/R3$

47. Pick out the correct statement from the following about parallel combination of resistors.

a) The current across the resistors are the same

b) The resistance offered by all resistors are the same

c) The potential difference is same across each resistor

d) The equivalent overall resistance is larger than the largest resistor

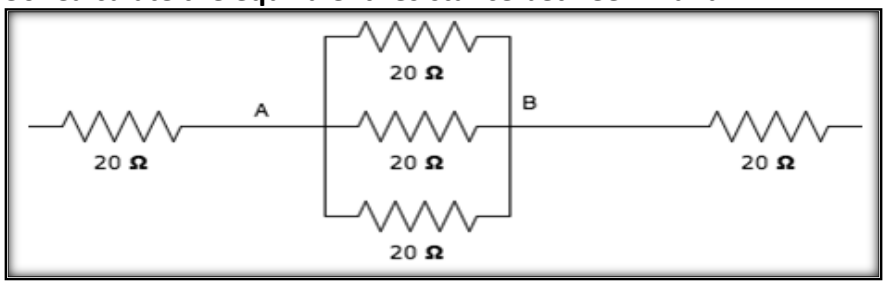
48. Two wires of the same material have the same length but their radii are in the ratio of 5:3. They are combined in series, where the resistance of the thicker wire is 12 ohms. Calculate the total resistance of the combination.

a) 40 b) 12 c) 32 d) 20

49. Two resistors are connected in parallel, whose resistance values are in the ratio 3:1. Find the ratio of power dissipated.

a) 1:3 b) 3:1 c) 1:2 d) 2:1

50. Calculate the equivalent resistance between A and B.



a) 6.67 ohm b) 46.67 ohm c) 26.67 ohm d) 10.67 ohm

51. What is the force exerted by a stationary charge when it is placed in a magnetic field?

a) Zero b) Maximum c) Minimum d) Depends on the strength of the magnetic field

52. The north pole of a magnet is brought near a stationary negatively charged conductor. What is the force experienced by it at the poles?

a) Maximum b) Minimum c) Zero d) Depend on the nature of the conductor

53. Identify the condition under which the force acting on a charge moving through a uniform magnetic field is minimum.

a) $\theta = 90^o$ b) $\theta = 180^o$ c) $\theta = 270^o$ d) $\theta = 340^o$

54. An electron moving with a velocity of 15 ms^{-1} enters a uniform magnetic field of 0.2 T, along a direction parallel to the field. What would be its trajectory in this field?

a) Elliptical b) Straight path c) Helical d) Circular

55. In a certain arrangement, a proton does not get deflected while moving through a magnetic field region. Under what condition is it possible?

a) F = 0 b) F = 180 N c) F = -180 N d) F = 3600 N

56. A proton enters a magnetic field of flux density 5 T with a velocity of 5×10^7 ms^{-1} at an angle of 30^o with the field. Find the force on the proton.

a) 0.2×10^{-11} N b) 2×10^{-11} N c) 20×10^{-11} N d) 200×10^{-11} N

57. Calculate the speed of an electron if it travels in a circular path of radius 50 cm in a magnetic field of 5×10^{-3} T.

a) 440×10^7 m/s b) 4×10^7 m/s c) 44×10^7 m/s d) 0.4×10^7 m/s

58. Give the SI unit of magnetic permeability of free space.

a) T A m^{-2} b) T A^{-2} m c) T A^{-1} m d) T A m^2

59. A wire placed along the north-south direction carries a current of 8 A from south to north. Find the magnetic field due to a 1 cm piece of wire at a point 200 cm north-east from the piece.

a) 14×10^{-9} T b) 1004×10^{-9} T c) 204.4×10^{-9} T d) 1.4×10^{-9} T

60. Which of the following is not a point of similarity between Biot-Savart law and Coulomb's law.

a) Both fields depend inversely on the square of the distance from the source to the point of observation

b) They are not a universal law

c) The principle of superposition does not apply to both

d) Both are long-range fields

61. The magnetic field due to a current carrying circular loop of radius 4 cm at a point on the axis at a distance of 7 cm from the center is 48 μT. What will be the value at the center of the loop?

a) 390 μT b) 393 μT c) 395 μT d) 397 Mt

62. There are two conductors X and Y carrying a current I and moving in the same direction. p and q are two electron beams also moving in the same direction. Will there be attraction or repulsion between the 2 conductors and between the two electron beams separately?

a) The electron beams will repel each other and conductors attract each other

b) The electron beams will attract each other and the conductors also attract each other

c) The electron beams will attract each other and the conductors repel each other

d) The electron beams will repel each other and the conductors also repel each other

63. Two long conductors, separated by a distance r carry current I_1 and I_2 in the same direction. They exert a force F on each other. Now, the current in one them is increased to 3 times and the direction is reversed. The distance is also increased to 5r. What is the new value of the force between them?

a) 3F/5 b) −3F/5 c) 5F/3 d) −5F/3

64. A solenoid of 0.5 m length with 100 turns carries a current of 5 A. A coil of 20 turns and of radius 0.02m carries a current of 0.6 A. What is the torque required to hold the coil with its axis at right angle to that of solenoid in the middle point of it?

a) 1.60 N m b) 15.89×10^{-5} N m c) 1.893×10^{-5} N m d) 1.893×10^{-8} N m

65. What is the magnetic field inside a pipe?

a) Unity b) Infinity c) Zero d) Two

66. Which law can ampere's circuital be derived from?

a) Gauss Law b) Newton's Law c) Kirchhoff's Law d) Biot-Savart Law

67. Find the true statement.

a) The force between two parallel current carrying wires is independent of the radii of the wires

b) The force between two parallel current carrying wires is independent of the length of the wires

c) The force between two parallel current carrying wires is independent of the magnitude of currents

d) The force between two parallel current carrying wires is independent of their distance of separation

68. What torque acts on a 50 turn coil of 200 cm^2 area carrying a current of 20 A held with its axis at right angles to a uniform magnetic field of 0.2T?

a) 8 Nm b) 0.8 Nm c) 4 Nm d) 0.8 Nm

69. Identify the factor on which the torque on a planar current loop does not depend.

a) Current b) Strength of magnetic field c) Area of the loop d) The shape of the loop

70. Give the SI unit of magnetic pole strength.

a) Tm b) Am^2 c) Am d) Tm^2

71. 'X' is the product of the pole strength of either magnetic pole and the magnetic length of the magnetic dipole. Identify X.

a) Magnetic dipole b) Magnetic dipole moment c) Magnetic pole strength d) Magnetic dipole length

72. Which among the following is true about magnetic susceptibility?

a) It is the ratio of magnetic intensity to intensity of magnetization

b) The SI unit of magnetic susceptibility is Tesla (T)

c) It is the ratio of intensity of magnetization to magnetic intensity

d) It is the ratio of magnetic moment to volume

73. The relative permeability of a medium is 0.050. What is its magnetic susceptibility?

a) 500 b) 501 c) 49.9 d) 499

74. The magnetic susceptibility of a paramagnetic material at -80^0C is 0.0085, then what is its value at -180^0C?

a) 0.015 b) 0.016 c) 0.017 d) 0.018

75. Find the correct combination regarding relative permeability and magnetic susceptibility of a paramagnetic substance.

a) $\mu_r > 1, \chi < 0$ b) $\mu_r < 1, \chi > 0$ c) $\mu_r < 1, \chi < 0$ d) $\mu_r > 1, \chi > 0$

76. Identify the correct dimensions of magnetic flux.

a) $[M^3 L^2 A^{-1} T^{-2}]$ b) $[M L^2 A^{-1} T^{-2}]$ c) $[M^2 L^2 A^{-1} T^{-2}]$ d) $[M L^2 A^{-1} T^2]$

77. Find out the correct relation from the following.

a) 1 Wb = 1 G cm b) 1 Wb = 1 Tm c) 1 Wb = 1 G cm^2 d) 1 Wb = 10^8 Maxwell

78. When is the magnetic flux said to be positive?

a) $\theta = 180^o$ b) $\theta = 360^o$ c) $\theta = 0^o$ d) $\theta = 90^o$

79. Which of the following is not an application of eddy currents?

a) Ammeter b) Dead beat galvanometer c) Speedometer d) Energy meters

80. Identify the law which is used to find out the direction of eddy currents.

a) Lenz's law b) Faraday's law c) Ampere circuital law d) Maxwell's law

81. Which of the following statement is valid?

a) Lenz's law is a consequence of the law of conservation of energy

b) Lenz's law is a consequence of the law of conservation of momentum

c) Lenz's law is a consequence of the law of conservation of force

d) Lenz's law is a consequence of the law of conservation of mass

82. What is proportional to the magnitude of the induced emf in the circuit?

a) Rate of change of current in the circuit b) Rate of change of resistance offered

c) Rate of change of magnetic flux d) Rate of change of voltage

83. The magnetic flux in a closed circuit of resistance 20 Ω varies with time t as $\Phi = 4t^3 + 2t^2 - 15t + 3$. Calculate the magnitude of induced emf at t = 1s.

a) 3 V b) 4 V c) 5 V d) 6 V

84. Write the dimensions of self-inductance.

a) $[M^3 L^2 T^{-2} A^{-2}]$ b) $[M L^2 T^{-2} A^{-2}]$ c) $[M^2 L^2 T^{-2} A^{-2}]$ d) $[M L^2 T^2 A^{-2}]$

85. Identify the factor on which self-inductance does not depend.

a) Number of turns b) Area of cross-section

c) Permeability of the core material d) The permittivity of the core material

86. Which of the following is the unit of mutual inductance?

a) VsA^{-2} b) V^3sA^2 c) V^2s d) VsA^{-1}

87. Calculate the mutual inductance between two coils if a current 10 A in the primary coil changes the flux by 500 Wb per turn in the secondary coil of 200 turns.

a) 10 H b) 10^4 H c) 1000 H d) 100 H

88. What is the self-inductance of the coil, if the magnetic flux of 10 microwebers is linked with a coil when a current of 5 mA flows through it?

a) 20 mH b) 5 mH c) 2 mH d) 250 Mh

89. Determine the self-inductance of a coil, which has a magnetic flux of 50 milliwebers that is produced when a current of 5 A flows through it?

a) 1×10^{-2} Wb b) 1×10^{-3} Wb c) 100 Wb d) 1×10^{3} Wb

90. If the current in one coil is steady, what happens to the mutual inductance?

a) Zero b) Infinity c) Doubles d) Halves

91. If the flux linkage in coil 1 is 3Wb and it has 500 turns and the current in coil 2 is 2A, calculate the mutual inductance.

a) 750H b) 500H c) 450H d) 900H

92. The flux linkage in coil 1 is 3 Wb and it has 500 turns and the current in coil 2 is xA, calculate the value of x if the mutual inductance is 750H.

a) 1A b) 2A c) 3A d) 4A

93. Which among the following is true about transformers?

a) Transformers are used to convert low alternating voltage to a high alternating voltage

b) Transformers are used to convert low alternating current to a high alternating current

c) Transformers are based on the phenomena of mutual electric field

d) Transformers are used only for low alternating voltage

94. Pick out the correct combination for a step-up transformer.

a) $k < 1; V_s > V_p, I_s > I_p, N_s > N_p$ b) $k > 1; V_s > V_p, I_s < I_p, N_s > N_p$

c) $k > 1; V_s > V_p, I_s > I_p, N_s > N_p$ d) $k < 1; V_s < V_p, I_s > I_p, N_s > N_p$

95. A transformer has an efficiency of 60% and works at 5kW. If the secondary voltage is 150 V, then what is the secondary current?

a) 10 A b) 20 A c) 30 A d) 40 A

96. Identify the function of a phasor from the following.

a) Phasor is a vector quantity used to represent a sinusoidal signal

b) Phasor is a scalar quantity used to represent a sinusoidal signal

c) Phasor is a vector quantity used to represent a cosine signal

d) Phasor is a scalar quantity used to represent a cosine signal

97. Find the total voltage applied in a series RLC circuit when i=3mA, V_L=30V, V_C=18V and R=1000 ohms. Note that it's an AC circuit.

a) 3.95V b) 12.37V c) 32.67V d) 6.67V

98. In an RLC circuit, the power factor is always _____

a) Positive b) Negative c) Depends on the circuit d) Zero

99. What is the resonance frequency of ac circuit?

a) $1/\sqrt{LC}$ b) $\sqrt{(L/C)}$ c) $\sqrt{LC}$ d) LC

100 What is impedance at resonance?

a) maximum b) minimum c) zero d) cannot be determined

101. What is the ratio of the speed of infrared and ultraviolet rays in a vacuum?

a) 1:5 b) 2:1 c) 1 d) 0

102. Is the ratio of frequencies of UV rays and IR rays in the glass more than, less than or equal to 1?

a) Insufficient data b) Equal to 1 c) Less than 1 d) More than 1

103. If the wavelength of electromagnetic radiation is doubled, what will happen to the energy of photons?

a) Doubled b) Halved c) Remains the same d) Becomes zero

104. Which among the following has a frequency range of 500 kHz to 1000 MHz?

a) Microwaves b) Infrared Waves c) Radio Waves d) Gamma Rays

105. Identify the electromagnetic wave which is also known as heatwaves.

a) Radio Waves b) Gamma Waves c) X-Rays d) Infrared Waves

106. Pick out the electromagnetic wave which is highly harmful to humans.

a) Radio waves b) Ultraviolet Rays c) Microwaves d) Infrared Waves

107. Mohit wanted to take photographs of a monument. But since the surrounding is filled with smoke, he is not able to take good photos. Which one of the following electromagnetic waves can be used in this situation to

help him?

a) X-rays b) Gamma rays c) Ultraviolet rays d) Infrared waves

108. Which is the frequency range of gamma rays from the following?

a) 1×10^{18} to 3×10^{22} Hz b) 3×10^{-18} to 5×10^{22} Hz c) 3×10^{18} to 5×10^{22} Hz d) 3×10^{-18} to 5×10^{-22} Hz

109. The speeds of microwaves, infrared waves, and ultraviolet waves are V_m, V_i, and V_u respectively. Identify the correct combination showing the different waves in vacuum.

a) $V_m > V_i > V_u$ b) $V_m = V_i = V_u$ c) $V_m < V_i < V_u$ d) $V_m > V_i < V_u$

110. Electromagnetic radiation has an energy of 15 keV. Then this radiation belongs to which region of electromagnetic waves?

a) X rays b) Infrared rays c) Gamma rays d) UV rays

111. Pick out the correct increasing order of energy of electromagnetic waves from the following.

a) $E_{infrared} < E_{micro} < E_{visible} < E_{ultraviolet} < E_{gamma}$ b) $E_{micro} < E_{infrared} < E_{visible} < E_{ultraviolet} < E_{gamma}$

c) $E_{micro} < E_{infrared} < E_{visible} < E_{gamma} < E_{ultraviolet}$ d) $E_{micro} < E_{infrared} < E_{ultraviolet} < E_{visible} < E_{gamma}$

112. Which of the following cannot travel in vacuum?

a) Radio waves b) Gamma Waves c) Infrared Waves d) Infrasonic waves

113. What is the frequency of the EM wave with a wavelength of 12cm?

a) 2.4Ghz b) 2.5Ghz c) 250 Mhz d) 0.25Mhz

114. Identify the factor on which the angle of deviation of the prism does not depend.

a) The angle of incidence b) The material of the prism c) The angle of reflection d) The wavelength of light used

115. What is the relative refractive index of water with respect to glass?

a) Unity b) More than unity c) Less than unity d) Zero

116. A lens immersed in a transparent liquid is not visible. Under what condition can this happen?

a) Less refractive index b) Higher refractive index c) Same refractive index d) Total internal reflection is zero

117. A concave mirror is held in water. What should be the change in the focal length of the mirror?

a) Halved b) Doubled c) Remains the same d) Increases exponentially

118. A man stands in front of a mirror of special shape. He finds that his image has a very small head, a fat body, and legs of normal size. What can we say about the shapes of the three parts of the mirror?

a) Convex, Concave, Plane b) The plane, Concave, Convex c) Concave, Convex, Plane d) Convex, Plane, Concave

119. Which of the following causes refraction of light?

a) Change in the density of light from one medium to another

b) Change in viscosity of light from one medium to another

c) Change in the speed of light from one medium to another

d) Change in direction of light from one medium to another

120.The magnification of 'X' is more than unity. Identify X.

a) Convex mirror b) Concave mirror c) Plane mirror d) Prism

121. Calculate its focal length if the radii of curvature of a double convex lens are 10 cm, and 20 cm and its refractive index is 1.75.

a) 50 cm b) 13 cm c) 8.9 cm d) 8 cm

122. If the radius of curvature of each face of the biconcave lens, made of glass of refractive index 1.25 is 50 cm, then what is the focal length of the lens in air?

a) 30 cm b) -100 cm c) 100 cm d) -30 cm

123. Which among the following is a portion of a transparent refracting medium bound by one spherical surface and the other plane surface?

a) Concave mirror b) Plane mirror c) Lens d) Prism

124. The dominant contribution to current comes from holes in case of which of the following?

a) Metals b) Intrinsic semiconductors

c) p-type extrinsic semiconductors d) n-type extrinsic semiconductors

125. Calculate the focal length of a biconvex lens if the radii of its surfaces are 50 cm and 20 cm, and index of refraction of the lens glass = 1.2.

a) 0.014 cm b) 0.715 cm c) 0.14 cm d) 71.5 cm

126. A lens has a focal length of 10 cm. Where the object should be placed if the image is to be 40 cm in the positive direction from the lens?

a) 12 cm b) 40 cm c) 13 cm d) 0.075

127. Find the magnification of the lens if the focal length of the lens is 10 cm and the size of the image is -30 cm.

a) 2 b) 3 c) 4 d) 5

128. A lens has a power of +3 D in air. What will be the power of the lens if it is completely immersed in water? Given, μ_g = 3/2 and μ_w = 4/3.

a) 5 D b) 3 D c) 1 D d) 3/4 D

129. Which of the following is a necessary condition for total internal reflection?

a) angle of incidence in the denser medium must be greater than the critical angle for two media

b) angle of incidence in the rarer medium must be greater than the critical angle for the two media

c) angle of incidence in the denser medium must be lesser than the critical angle for the two media

d) angle of reflection in the denser medium must be greater than the critical angle for the two media

130. Identify the principle behind the sparkling of diamonds.

a) Total internal reflection b) Refraction c) Reflection d) Optical activity

131. The speed of the yellow light in a certain liquid is 2.4×10^8 m/s. Find the refractive index of the liquid.

a) 6.25 b) 5.73 c) 1.25 d) 9.73

132. The wavelength of light coming from a sodium source is 589 nm. What will be its wavelength in the water?

a) 625 nm b) 443 nm c) 789 nm d) 125 nm

133. What is the cause of diffraction?

a) Interference of primary wavelets b) Interference of secondary wavelets

c) Reflection of primary wavelets d) Reflection of secondary wavelets

134. Identify the condition which is not necessary for two light waves to be coherent.

a) The two waves must be continuous

b) The two waves should be of the same frequency or wavelength

c) They should have a constant or zero phases difference

d) They two light sources should be narrow

135. The absolute refractive indices of glass and water are 3/2 and 4/3. Determine the ratio of the speeds of light in glass and water.

a) 5:7 b) 9:8 c) 7:5 d) 8:9

136. When Two waves of same amplitude add constructively, the intensity becomes _____

a) Double b) Half c) Four Times d) One-Fourth

137. If instead of monochromatic light white light is used for interference of light, what would be the change in the observation?

a) The pattern will not be visible

b) The shape of the pattern will change from hyperbolic to circular

c) Coloured fringes will be observed with a white bright fringe at the center

d) The bright and dark fringes will change position

138. If the light is incident on an optically denser medium, then what is the relationship between the angle of incidence, I, **and the angle of refraction, r?**

a) r > I b) i > r c) i = r d) r = 0

139. In Young's double-slit experiment with monochromatic light, how is fringe width affected, if the screen is moved closer to the slits?

a) Independent b) Remains the same c) Increases d) Decreases

140. In Young's double-slit experiment, lights of green, yellow, and orange colors are successively used. Write the fringe widths for the three colors in increasing order.

a) $\beta_G < \beta_Y < \beta_O$ b) $\beta_O < \beta_Y < \beta_G$ c) $\beta_O < \beta_G < \beta_Y$ d) $\beta_Y < \beta_G < \beta_O$

141. In Young's double-slit experiment, the two parallel slits are made one millimeter apart and a screen is placed one meter away. What is the fringe separation when blue-green light of wavelength 500 nm is used?

a) 0.5 mm b) 50 mm c) 0.25 mm d) 25 mm

142. What would be the resultant intensity at a point of destructive interference, if there are two identical coherent waves of intensity I_0 producing an interference pattern?

a) 5 I_0 b) 2 I_0 c) I_0 d) zero

143. What would be the resultant intensity at a point of constructive interference, if there are two identical coherent waves of intensity I' producing an interference pattern?

a) 4 I' b) 0 c) I' d) 2 I'

144. If the separation between the two slits is decreased in Young's double-slit experiment keeping the screen position fixed, what will happen to the width of the fringe?

a) Decreases b) Increases c) Remains the same d) Independent

145. In Young's double-slit experiment if the distance between two slits is halved and distance between the slits and the screen is doubled, then what will be the effect on fringe width?

a) Doubled b) Decreases four times c) Increases four times d) Halved

146. If the intensity of incident radiation in a photo-cell is increased, how does the stopping potential vary?

a) Increases b) Remains the same c) Decreases d) Infinite

147. How does retarding potential vary with the frequency of light causing photoelectric effect?

a) Infinite b) Zero c) Decreases d) Increases

148. The maximum kinetic energy of a photoelectron is 3 eV. What is the stopping potential?

a) 0 V b) 3 V c) 9 V d) 12 V

149. The stopping potential in an experiment on the photoelectric effect is 1.5 V. What is the maximum kinetic energy of the photoelectrons emitted?

a) 1.5 eV b) 3 eV c) 4.5 eV d) 6 eV

150. For a photosensitive surface, the work function is 3.3×10^{-19} J. Calculate the threshold frequency.

a) 15×10^{14} Hz b) 25×10^{14} Hz c) 5×10^{14} Hz d) 55×10^{14} Hz

151. Calculate the kinetic energy of a photoelectron (in eV) emitted on shining light of wavelength 6.2×10^{-6} m on a metal surface. The work function of the metal is 0.1 eV.

a) 10 eV b) 0.1 eV c) 0.01 eV d) 1000 eV

152. Two metals A and B have work functions 4 eV and 10 eV respectively. Which metal has a higher threshold wavelength?

a) Metal A b) Metal B c) Both d) Neither

153. Which of the following increases the maximum kinetic energy of the photoelectrons emitted?

a) Increasing the frequency of the incident beam b) Increasing the velocity of the electrons

c) Decreasing the frequency of the incident beam d) Increasing the mass of the photoelectrons

154. During Einstein's Photoelectric Experiment, what changes are observed when the frequency of the incident radiation is increased?

a) The value of saturation current increases b) No effect

c) The value of stopping potential increases d) The value of stopping potential decreases

155. How does the intensity affect the photoelectric current?

a) As intensity increases, the photoelectric effect increases

b) As the intensity increases, the photoelectric effect decreases

c) As the intensity decreases, the photoelectric effect becomes twice

d) No effect

156. The work function of lithium is 2.5 eV. The maximum wavelength of light that can cause the photoelectric effect in lithium is _____

a) 3980 Å b) 4980 Å c) 5980 Å d) 6980 Å

157. Light of wavelength 3500 Å is incident on two metals A and B. Which metal will yield more photoelectrons if their work functions are 5 eV and 2 eV respectively?
a) A b) B c) A & B d) C
58. What is the effect of intensity on the stopping potential?
a) As intensity increases, stopping potential increases linearly
b) As intensity increases, stopping potential decreases linearly
c) As intensity decreases, stopping potential increases exponentially
d) No effect
159. Find the true statement.
a) An electron will not lose energy when jumping from the 1^{st} orbit to the 3^{rd} orbit
b) An electron will not give energy when jumping from the 1^{st} orbit to the 3^{rd} orbit
c) An electron will release energy when jumping from the 1^{st} orbit to the 3^{rd} orbit
d) An electron will absorb energy when jumping from the 1^{st} orbit to the 3^{rd} orbit
160. What is the ratio of minimum to maximum wavelength in the Balmer series?
a) 5:9 b) 5:36 c) 1:4 d) 3:4
161. Find out the minimum energy required to take out the only one electron from the ground state of Li^{+}?
a) 13.6 eV b) 122.4 eV c) 25.3 eV d) 67.9 eV
162. What is the energy required to ionize an H-atom from the third excited state, if ground state ionization energy of H-atom is 13.6 eV?
a) 1.5 eV b) 3.4 eV c) 13.6 eV d) 12.1 eV
163. Which of the following did Bohr use to explain his theory?
a) Conservation of linear momentum b) The quantization of angular momentum
c) Conservation of quantum frequency d) Conservation of mass
164. According to Bohr's principle, what is the relation between the principal quantum number and the radius of the orbit?
a) r proportional to 1/n b) r proportional to $1/n^2$ c) r proportional to n d) r proportional to n^2
165. If an α-particle collides head-on with a nucleus, what is its impact parameter?
a) Zero b) Infinite c) 10^{-10} m d) 10^{10} m
166. In which of the following system, will the radius of the first orbit (n=1) be minimum?
a) Doubly ionized lithium b) Singly ionized helium c) Deuterium atom d) Hydrogen atom
167. An α-particle of energy 10 MeV is scattered through 180^{o} by a fixed uranium nucleus. Calculate the order of distance of the closest approach?
a) 10^{-20}cm b) 10^{-12}cm c) 10^{-11}cm d) 10^{12}cm
168. What causes spectral lines?
a) The transition of electrons between two energy levels
b) The transition of electrons between two wavelength ranges
c) Magnetic and electric field exiting in an atom
d) The transition of electrons from electric to magnetic field
169. Which of the following is found in the UV region of the spectrum?
a) Pfund series b) Brackett series c) Lyman series d) Paschen series
170. How did de – Broglie modify Bohr's postulate?
a) de – Broglie suggested to not take angular momentum into consideration
b) de – Broglie suggested introducing an electric field near the atom
c) de – Broglie suggested that electrons behaved like a wave
d) de – Broglie did not modify Bohr's second postulate
171. What will be the longest wavelength in the Balmer series of hydrogen spectrum?
a) 6557×10^{-10} m b) 5557×10^{-10} m c) 9557×10^{-10} m d) 1557×10^{-10} m
172. A hydrogen atom in its ground state absorbs 10.2 eV of energy. What is the orbital angular momentum is increased by?
a) 4.22×10^{-3} Js b) 2.11×10^{-34} Js c) 3.16×10^{-34} Js d) 1.05×10^{-34} Js

173. Hydrogen atoms are excited from ground state to the state of principal quantum number 4. Then, what will be the number of spectral lines observed?
a) 3 b) 6 c) 5 d) 2
174. When a hydrogen atom is in its first excited level, what is the relation of radius and Bohr radius?
a) Twice b) 4 times c) Same d) Half
175. Find the true statement.
a) Nuclear charge is dependent on the charge
b) The nuclear force is weaker than the electromagnetic force
c) The nuclear force is independent of charge
d) The nuclear force is weaker than the gravitational force
176. Which of the following is used as a moderator in a nuclear reactor?
a) Cadmium b) Plutonium c) Uranium d) Heavy water
77. In nuclear reactors, what are the controlling rods made of?
a) Cadmium b) Graphite c) Stainless steel d) Plutonium
178. Which of the following has the highest neutron ratio?
a) ${}_{8}O^{16}$ b) ${}_{2}He^{4}$ c) ${}_{26}Fe^{56}$ d) ${}_{92}U^{235}$
179. If elements with principal quantum number n > 4 were not allowed in nature, then what will be the number of possible elements?
a) 60 b) 20 c) 4 d) 64
180. Which of the following is a stable nucleus?
a) The nucleus with even protons and odd electrons
b) The nucleus with even number of protons and neutrons
c) The nucleus with even neutrons and odd protons
d) The nucleus with odd protons and neutrons
181. Identify the expression for the nuclear radius from the following.
a) $R = R_0 \sqrt[3]{A}$ b) $R = R_0 \sqrt{A}$ c) $R = R_0 A^3$ d) $R = R_0 A^2$
182. The energy band gap is maximum in which of the following?
a) Metals b) Superconductors c) Insulators d) Semiconductors
183. At absolute zero, Si acts as which of the following?
a) Non-metal b) Metal c) Insulator d) Superconductor
184. In semiconductors at room temperature, which of the following is likely to happen?
a) The valence band is partially empty and the conduction band is partially filled
b) The valence band is filled and the conduction band is partially filled
c) The valence band is filled
d) The conduction band is empty
185. Which of the following is true regarding insulators?
a) The valence band is partially filled with electrons
b) The conduction band is partially filled with electrons
c) The conduction band is filled with electrons and valence band empty
d) The conduction band is empty and valence band is filled with electrons
186. In a pure semiconductor crystal, if current flows due to breakage of crystal bonds, then what is the semiconductor called?
a) Acceptor b) Donor c) Intrinsic semiconductor d) Extrinsic semiconductor
187. On doping germanium metal, with a little amount of indium, what does one get?
a) Intrinsic semiconductor b) Insulator c) n-type semiconductor d) p-type semiconductor
188. Which of the following, when added as an impurity, into the silicon, produces n-type semiconductor?
a) Phosphorous b) Aluminum c) Magnesium d) Sulfur
189. In n-type semiconductors, which one is the majority charge carriers?
a) Holes b) Protons c) Neutrons d) Electrons
190. What will happen when a p-n diode is reversed-biased?
a) No current flows b) The depletion region is increased
c) The depletion region is reduced d) The height of the potential barrier is reduced
191. Which of the following accounts for the presence of the potential barrier in the depletion layer?
a) Ions b) Holes c) Electrons d) Forbidden band

192. What causes drift current in a p-n junction diode?

a) Electric field b) Charge carriers density c) Collision of electrons d) Electric potential

193. When a junction diode is reverse biased, what causes current across the junction?

a) Diffusion of charges b) Nature of material c) Drift of charges d) Both drift and diffusion of charges

194. What is the ripple factor for a half-wave rectifier?

a) 2.0 b) 1.21 c) 0.482 d) 0.877

195. Choose the false statement from the following.

a) In conductors the valence and conduction band overlap

b) Substances with an energy gap of the order of 10 eV are insulators

c) The resistivity of a semiconductor increases with increase in temperature

d) The conductivity of a semiconductor increases with increase in temperature

196. Which of the following statements is not true?

a) The resistance of intrinsic semiconductor decreases with the increase of temperature

b) Doping pure Si with trivalent impurities gives p-type semiconductors

c) The majority carriers in n-type semiconductors are holes

d) A p-n junction can act as a semiconductor diode

197. A small impurity is added to germanium to get a p-type semiconductor. Identify the impurity?

a) Bivalent substance b) Trivalent substance

c) Pentavalent substance d) Monovalent substance

198. What is the height of potential barrier in germanium crystal?

a) 0.7 V b) 0.3 V c) 1.1 V d) 0.72 eV

199. What is the order of magnitude of electric field across the depletion region?

a) 10^{-6} Vm^{-1} b) 10^{-8} Vm^{-1} c) 10^{-4} Vm^{-1} d) 10^{-9} Vm^{-1}

200. The refractive Index of vacuum is

a) 1 b) Zero c) 1.5 d) 1.33

12TH CLASS PHYSICS MCQ ANSWER KEY														
C	26	C	51	A	76	B	101	C	126	C	151	B	176	D
D	27	A	52	C	77	D	102	D	127	A	152	A	177	A
A	28	B	53	B	78	C	103	B	128	C	153	A	178	D
A	29	B	54	B	79	A	104	C	129	A	154	C	179	A
C	30	C	55	A	80	A	105	D	130	A	155	A	180	B
D	31	A	56	B	81	A	106	B	131	C	156	B	181	A
B	32	C	57	C	82	C	107	D	132	B	157	B	182	C
C	33	A	58	C	83	B	108	C	133	B	158	D	183	C
B	34	A	59	D	84	B	109	B	134	D	159	D	184	A
D	35	B	60	C	85	D	110	A	135	D	160	A	185	A
A	36	B	61	B	86	D	111	B	136	C	161	B	186	C
D	37	B	62	B	87	B	112	D	137	C	162	A	187	D
C	38	C	63	B	88	C	113	B	138	B	163	B	188	A
B	39	D	64	C	89	A	114	C	139	C	164	D	189	D
C	40	A	65	C	90	A	115	C	140	B	165	A	190	B
D	41	C	66	D	91	A	116	C	141	A	166	A	191	A
D	42	A	67	A	92	B	117	C	142	D	167	B	192	B
B	43	C	68	C	93	A	118	A	143	A	168	A	193	C
B	44	A	69	D	94	B	119	C	144	B	169	C	194	B
A	45	C	70	C	95	B	120	B	145	C	170	C	195	C
A	46	A	71	B	96	A	121	C	146	B	171	A	196	C
B	47	C	72	C	97	B	122	B	147	D	172	D	197	B
C	48	C	73	D	98	C	123	C	148	B	173	D	198	B
D	49	A	74	C	99	A	124	C	149	A	174	B	199	A
D	50	A	75	D	100	B	125	D	150	C	175	C	200	A