12TH PHYSICS MCQS TEST CHP 1 2 3

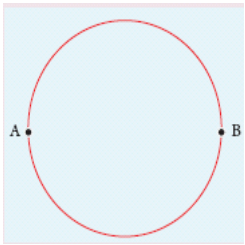
Exam Time: 01:30 Hrs | Total Marks: 100

Multiple Choice Question 100 x 1 = 100

1.The following graph shows current versus voltage values of some unknown conductor. What is the resistance of this conductor?

(a) 2 ohm (b) 4 ohm (c) 8 ohm (d) 1 ohm

2.A wire of resistance 2 ohms per meter is bent to form a circle of radius 1m. The equivalent resistance between its two diametrically opposite points, A and B as shown in the figure is



(a) $\pi\Omega$ (b) $\frac{\pi}{2}\Omega$ (c) $2\pi\Omega$ (d) $\frac{\pi}{4}\Omega$

3.A toaster operating at 240 V has a resistance of 120 Ω. The power is _____.

(a) 400 W (b) 2 W (c) 480 W (d) 240 W

4.A carbon resistor of (47 ± 4.7) k Ω to be marked with rings of different colours for its identification. The colour code sequence will be _____.

(a) Yellow – Green – Violet – Gold (b) Yellow – Violet – Orange – Silver
(c) Violet – Yellow – Orange – Silver (d) Green – Orange – Violet - Gold

5.What is the value of resistance of the following resistor?

(a) 100 k Ω (b) 10 k Ω (c) 1 k Ω (d) 1000 k Ω

6.Two wires of A and B with circular cross section made up of the same material with equal lengths. Suppose $R_A = 3\ R_B$, then what is the ratio of radius of wire A to that of B?

(a) 3 (b) $\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{1}{3}$

7.A wire connected to a power supply of 230 V has power dissipation P_1. Suppose the wire is cut into two equal pieces and connected parallel to the

same power supply. In this case power dissipation is P_2. The ratio $\frac{P_2}{P_1}$ is _____.

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

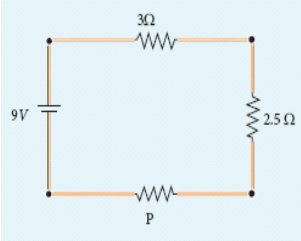
8. In India electricity is supplied for domestic use at 220 V. It is supplied at 110 V in USA. If the resistance of a 60 W bulb for use in India is R, the resistance of a 60 W bulb for use in USA will be _____.

(a) R (b) 2R (c) $\frac{R}{4}$ (d) $\frac{R}{2}$

9. In a large building, there are 15 bulbs of 40 W, 5 bulbs of 100 W, 5 fans of 80 W and 1 heater of 1 kW are connected. The voltage of electric mains is 220 V. The maximum capacity of the main fuse of the building will be _____.

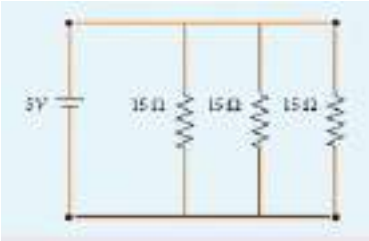
(a) 14 A (b) 8 A (c) 10 A (d) 12 A

10. There is a current of 1.0 A in the circuit shown below. What is the resistance of P ?



(a) 1.5 Ω (b) 2.5 Ω (c) 3.5 Ω (d) 4.5 Ω

11. What is the current drawn out from the battery?



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

12. The temperature coefficient of resistance of a wire is 0.00125 per °C. At 20°C, its resistance is 1 Ω. The resistance of the wire will be 2 Ω at _____.

(a) 800 °C (b) 700 °C (c) 850 °C (d) 820 °C

13. The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10 Ω is _____.

(a) 0.2 Ω (b) 0.5 Ω (c) 0.8 Ω (d) 1.0 Ω

14. A piece of copper and another of germanium are cooled from room temperature to 80 K. The resistance of _____.

(a) each of them increases (b) each of them decreases
(c) copper increases and germanium decreases
(d) copper decreases and germanium increases

15. In Joule's heating law, when R and t are constant, if the H is taken along the y axis and I^2 along the x axis, the graph is _____.

(a) straight line (b) parabola (c) circle (d) ellipse

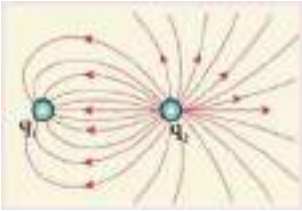
16. Two identical point charges of magnitude –q are fixed as shown in the figure below. A third charge +q is placed midway between the two charges at the point P. Suppose this charge +q is displaced a small distance from the point P in the directions indicated by the arrows, in which direction(s) will +q be stable with respect to the displacement?

(a) A_1 and A_2 (b) B_1 and B_2 (c) both directions (d) No stable

17. Which charge configuration produces a uniform electric field?

(a) point charge (b) uniformly charged infinite line
(c) uniformly charged infinite plane (d) uniformly charged spherical shell

18. What is the ratio of the charges $\left|\frac{q_1}{q_2}\right|$ for the following electric field line pattern?

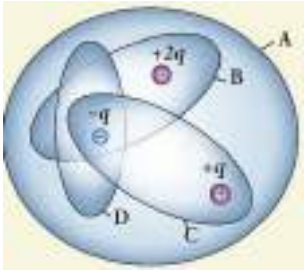


(a) $\frac{1}{5}$ (b) $\frac{25}{11}$ (c) 5 (d) $\frac{11}{25}$

19. An electric dipole is placed at an alignment angle of 30° with an electric field of 2×10^5 NC^{-1}. It experiences a torque equal to 8 N m. The charge on the dipole if the dipole length is 1 cm is

(a) 4 mC (b) 8 mC (c) 5 mC (d) 7 mC

20. Four Gaussian surfaces are given below with charges inside each Gaussian surface. Rank the electric flux through each Gaussian surface in increasing order.



(a) D < C < B < A (b) A < B = C < D (c) C < A = B < D (d) D > C > B > A

21. The total electric flux for the following closed surface which is kept inside water

(a) $\frac{80q}{\varepsilon_0}$ (b) $\frac{q}{40\varepsilon_0}$ (c) $\frac{q}{80\varepsilon_0}$ (d) $\frac{q}{160\varepsilon_0}$

22. Two identical conducting balls having positive charges q_1 and q_2 are separated by a centre to centre distance r. If they are made to touch each other and then separated to the same distance, the force between them will be _____.

(a) less than before (b) same as before (c) more than before (d) zero

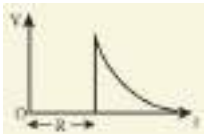
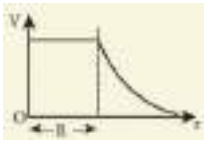
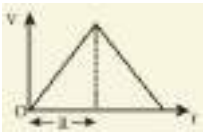
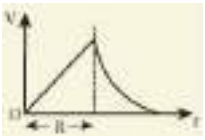
23. Rank the electrostatic potential energies for the given system of charges in increasing order

(a) 1 = 4 < 2 < 3 (b) 2 = 4 < 3 < 1 (c) 2 = 3 < 1 < 4 (d) 3 < 1 < 2 < 4

24. An electric field $\vec{E} = 10x\hat{i}$ exists in a certain region of space. Then the potential difference V = V_o – V_A, where V_o is the potential at the origin and V_A is the potential at x = 2 m is _____.

(a) 10 V (b) -20 V (c) +20 V (d) -10 V

25. A thin conducting spherical shell of radius R has a charge Q which is uniformly distributed on its surface. The correct plot for electrostatic potential due to this spherical shell is _____.

(a)  (b)  (c)  (d) 

26. Two points A and B are maintained at a potential of 7 V and -4 V respectively. The work done in moving 50 electrons from A to B is _____.

(a) 8.80×10^{-17} J (b) -8.80×10^{-17} J (c) 4.40×10^{-17} J (d) 5.80×10^{-17} J

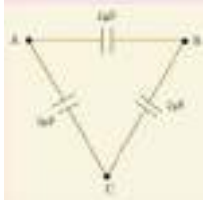
27. If voltage applied on a capacitor is increased from V to 2V, choose the correct conclusion.

(a) Q remains the same, C is doubled (b) Q is doubled, C doubled
(c) C remains same, Q doubled (d) Both Q and C remain same

28. A parallel plate capacitor stores a charge Q at a voltage V. Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?

(a) Capacitance (b) Charge (c) Voltage (d) Energy density

29. Three capacitors are connected in triangle as shown in the figure. The equivalent capacitance between the points A and C is

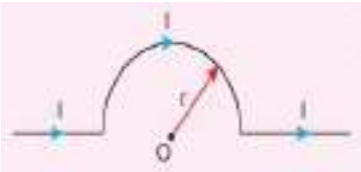


(a) 1μF (b) 2μF (c) 3μF (d) $\frac{1}{4}$μF

30. Two metallic spheres of radii 1 cm and 3 cm are given charges of -1×10^{-2} C and 5×10^{-2} C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is

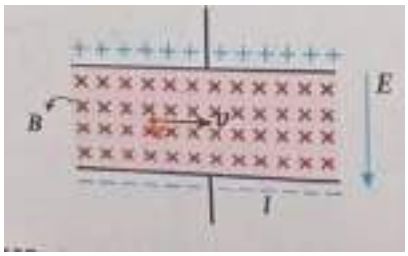
(a) 3×10^{-2} C (b) 4×10^{-2} C (c) 1×10^{-2} C (d) 2×10^{-2} C

31. The magnetic field at the centre O of the following current loop is



(a) $\frac{\mu_0 I}{4r} \otimes$ (b) $\frac{\mu_0 I}{4r} \odot$ (c) $\frac{\mu_0 I}{2r} \otimes$ (d) $\frac{\mu_0 I}{2r} \odot$

32. An electron moves in a straight line inside a charged parallel plate capacitor of uniform charge density σ. The time taken by the electron to cross the parallel plate capacitor undeflected when the plates of the capacitor are kept under constant magnetic field of induction $(\vec{B})$ is



(a) $\varepsilon_0 \frac{elB}{\sigma}$ (b) $\varepsilon_0 \frac{lB}{\sigma l}$ (c) $\varepsilon_0 \frac{lB}{e\sigma}$ (d) $\varepsilon_0 \frac{lB}{\sigma}$

33. A particle having mass m and charge q accelerated through a potential difference V. Find the force experienced when it is kept under perpendicular magnetic field $\vec{B}$.

(a) $\sqrt{\frac{2q^3BV}{m}}$ (b) $\sqrt{\frac{q^3B^2V}{2m}}$ (c) $\sqrt{\frac{2q^3B^2V}{m}}$ (d) $\sqrt{\frac{2q^3BV}{m^3}}$

34. A circular coil of radius 5 cm and 50 turns carries a current of 3 ampere. The magnetic dipole moment of the coil is nearly ____.

(a) 1.0 A m^2 (b) 1.2 A m^2 (c) 0.5 A m^2 (d) 0.8 A m^2

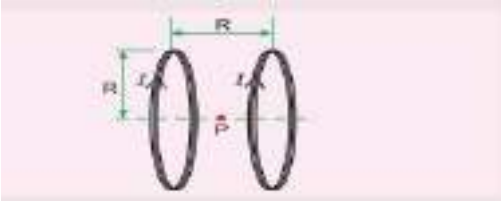
35. A thin insulated wire forms a plane spiral of N = 100 tight turns carrying a current I = 8 m A (milli ampere). The radii of inside and outside turns are a = 50 mm and b = 100 mm respectively. The magnetic induction at the centre of the spiral is _____.

(a) $5\mu T$ (b) $7\mu T$ (c) $8\mu T$ (d) $10\mu T$

36. Three wires of equal lengths are bent in the form of loops. One of the loops is circle, another is a semi-circle and the third one is a square. They are placed in a uniform magnetic field and same electric current is passed through them. Which of the following loop configuration will experience greater torque?

(a) Circle (b) Semi-circle (c) Square (d) All of them

37.Two identical coils, each with N turns and radius R are placed coaxially at a distance R as shown in the figure. If I is the current passing through the loops in the same direction, then the magnetic field at a point P at a distance of R/2 from the centre of each coil is _____.

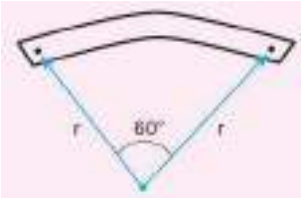


(a) $\frac{8N\mu_\circ I}{\sqrt{5}R}$ (b) $\frac{8N\mu_\circ I}{5^{3/2}R}$ (c) $\frac{8N\mu_\circ I}{5R}$ (d) $\frac{4N\mu_\circ I}{\sqrt{5}R}$

38.A wire of length l carrying a current I along the Y direction is kept in a magnetic field is given by $\vec{B} = \frac{\beta}{\sqrt{3}} = (\hat{i} + \hat{j} + \hat{k})T$. The magnitude of Lorentz force acting on the wire is _____.

(a) $\sqrt{\frac{2}{3}}\beta Il$ (b) $\sqrt{\frac{1}{3}}\beta Il$ (c) $\sqrt{2}\beta Il$ (d) $\sqrt{\frac{1}{2}}\beta Il$

39.A bar magnet of length l and magnetic moment p_m is bent in the form of an arc as shown in Figure. The new magnetic dipole moment will be

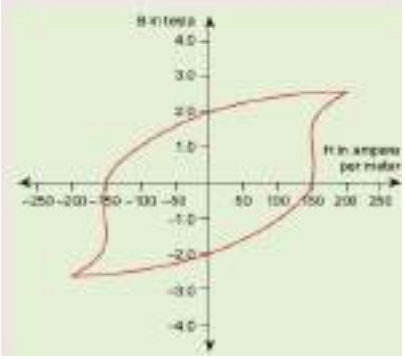


(a) p_m (b) $\frac{3}{\pi}p_m$ (c) $\frac{2}{\pi}p_m$ (d) $\frac{1}{2}p_m$

40.A non-conducting charged ring carrying a charge of q, mass m and radius r is rotated about its axis with constant angular speed ω. Find the ratio of its magnetic moment with angular momentum is _____.

(a) $\frac{q}{m}$ (b) $\frac{2q}{m}$ (c) $\frac{q}{2m}$ (d) $\frac{q}{4m}$

41.The BH curve for a ferromagnetic material is shown in the figure. The material is placed inside a long solenoid which contains 1000 turns/cm. The current that should be passed in the solenoid to demagnetize the ferromagnet completely is _____.



(a) 1.00 m A (b) 1.25 mA (c) 1.50 mA (d) 1.75 mA

42.Two short bar magnets have magnetic moments 1.20 Am^2 and 1.00 Am^2 respectively. They are kept on a horizontal table parallel to each other with

their north poles pointing towards south. They have a common magnetic equator and are separated by a distance of 20.0 cm. The value of the resultant horizontal magnetic induction at the mid-point O of the line joining their centres is (Horizontal components of Earth's magnetic induction is 3.6 × 10^{-5} Wb m^{-2})

(a) 3.60 × 10^{-5} Wb m^{-2} (b) 3.5 × 10^{-5} Wb m^{-2} (c) 2.56 × 10^{-4} Wb m^{-2} (d) 2.2 × 10^{-4} Wb m^{-2}

43. The vertical component of Earth's magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place?

(a) 30° (b) 45° (c) 60° (d) 90°

44. A flat dielectric disc of radius R carries an excess charge on its surface. The surface charge density is σ. The disc rotates about an axis perpendicular to its plane passing through the center with angular velocity ω. Find the magnitude of the torque on the disc if it is placed in a uniform magnetic field whose strength is B which is directed perpendicular to the axis of rotation.

(a) $\frac{1}{4}\sigma\omega\pi BR$ (b) $\frac{1}{2}\sigma\omega\pi BR^2$ (c) $\frac{1}{4}\sigma\omega\pi BR^3$ (d) $\frac{1}{4}\sigma\omega\pi BR^4$

45. A simple pendulum with charged bob is oscillating with time period T and lets θ be the angular displacement. If the uniform magnetic field switched ON in a direction perpendicular to the plane of oscillation then _____.

(a) time period will decrease but θ will remain constant
(b) time period remain constant but θ will decrease
(c) both T and θ will remain the same (d) both T and θ will decrease

46. The electrostatic force obeys _____.

(a) Newton's I law (b) Newton's II law (c) Newton's III law
(d) none of the above

47. The value of constant 'K' in coulomb law is _____.

(a) 0.9 x 10^9 Nm^2 C^2 (b) 9 x 10^{-9} Nm^2C^2 (c) 9 x 10^9 Nm^{-2} C^{-2}
(d) 9 x 10^9 Nm^2 C^{-2}

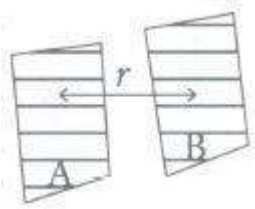
48. The relative permittivity of water is _____.

(a) $\varepsilon_r = 70$ (b) $\varepsilon_r = 75$ (c) $\varepsilon_r = 80$ (d) $\varepsilon_r = 85$

49. _____ and Coulomb's law form fundamental principles of electrostatics

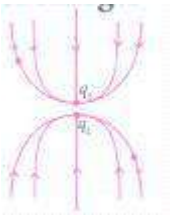
(a) Newton's law of gravitation (b) superposition principle (c) ohm's law
(d) Kepler's law

50. The figure shows tow parallel equipotential surface A and B kept at a small distance 'r' a part from each other. A point change of Q coulomb is taken from the surface A to B. The amount of net work done will be



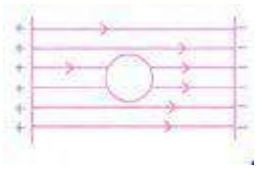
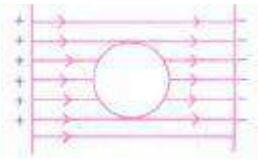
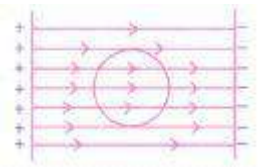
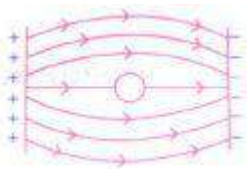
(a) $W = \frac{-1}{4\pi\varepsilon_0 r}\frac{q}{r}$ (b) $W = \frac{1}{4\pi\varepsilon_0 r}\frac{q}{r}$ (c) $W = \frac{-1}{4\pi\varepsilon_0 r}\frac{q}{r^2}$ (d) zero

51. The given figure is a plot of lines of force due to two charges q_1 & q_2 find out the sign of charges



(a) both negative (b) both positive (c) upper positive and lower negative (d) upper negative and lower positive

52. An uncharged metal sphere is placed between two equal and oppositely charged metal plates. The nature of lines of force will be _____

(a)  (b)  (c)  (d) 

53. An isolated metal sphere of radius 'r' is given a charge' q'. The potential energy of the sphere is _____

(a) $\frac{q^2}{4\pi\varepsilon_0 r}$ (b) $\frac{q}{4\pi\varepsilon_0 r}$ (c) $\frac{q}{8\pi\varepsilon_0 r}$ (d) $\frac{q^2}{8\pi\varepsilon_0 r}$

54. In a hydrogen atom the electron revolves around the proton in an orbit of 0.53 $\mathring{A}$. The potential produced by the electron on the nuleus is _____

(a) 6.8 V (b) 13.6 V (c) 54.4 V (d) 27.2 V

55. Eight mercury droplets having a radius of 1 mm and charge of 0.066 PC each merge to form one droplet. Its potential is _____

(a) 2.4 V (b) 1.2 V (c) 3.6 V (d) 4.8 V

56. A force of 40 N is acting between two charges in air if the space between then is filled with glass ε_r = 8. Then the force between then is _____

(a) 20 N (b) 10 N (c) 5 N (d) the same and does not change

57. The concept of 'Field' was introduced by _____

(a) Faraday (b) Gauss (c) Maxwell (d) None

58. The force experienced by a unit charge is called _____

(a) Electric potential (b) Electric flux (c) Electric field (d) Static electricity

59. The expression for electric field in vector form is

(a) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r}\hat{r}$ (b) $\frac{-1}{4\pi\varepsilon_0}\frac{q}{r}\hat{r}$ (c) $\frac{-1}{4\pi\varepsilon_0}\frac{q}{r^2}\hat{r}$ (d) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}\hat{r}$

60. Which one of these is a vector quantity?

(a) Electric charge (b) Electric field (c) Electric flux (d) Electric potential

61. The colour code on a carbon resistor is red - red - black. The resistance of the resistor is _____.

(a) 2.2Ω (b) 22Ω (c) 220 2.2Ω (d) $2.2k\Omega$

62. The electrical resistivity of a thin copper wire and a thick copper wire are respectively $P_1\Omega$ m and $P_2\Omega$ m Then_____.

(a) $P_1 > P_2$ (b) $P_2 > P_1$ (c) $P_1 = P_2$ (d) $\frac{P_1}{P_2}$

63. When 'n' resistors of equal resistance (R) are connected in series and in parallel respectively, then the ratio of their effective resistance is _____

(a) 1: n^2 (b) n^2: 1 (c) n: 1 (d) 1: n

64. Which of the following has negative temperature coefficient of resistance?

(a) copper (b) tungsten (c) carbon (d) silver

65. The temperature co-efficient of resistance for alloys is _____.

(a) low (b) very low (c) high (d) very high

66. Which of the following material has the highest specific resistance?

(a) rubber (b) silver (c) germanium (d) glass

67. Temperature co-effieient of resistance for metals is _____.

(a) constant (b) positive (c) zero (d) negative

68. An electron gun in a TV shoots out a beam of electrons. The beam current is 10μA. The charge that strikes the screen in 1 minute is _____.

(a) $+600\mu C$ (b) $-600\mu C$ (c) $+10\mu C$ (d) $-10\mu C$

69. If the specific resistance of a potentiometer wire is 10^{-7} Om and current flowing through it is 0.1 amp, cross-sectional area of wire is 10^{-6} m^2, then potential gradient will be _____.

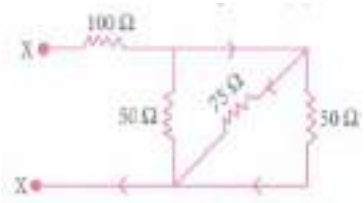
(a) 10^{-2} v/m (b) 10^{-4} v/m (c) 10^{-6} v/m (d) 10^{-8}v/m

70. A metallic block has no potential difference applied across it, then the mean velocity of free electrons is _____.

(a) proportional to T (b) proportional for $\sqrt{T}$

(c) finite but independent of temperature (d) zero

71. In an electrical arrangement as shown the equivalent resistance between X and Y will be



(a) 158.75Ω (b) 118.75Ω (c) 218.75Ω (d) 318.75Ω

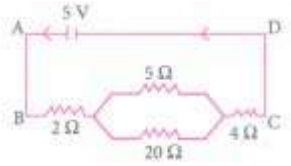
72. The emf of a battery is 3 volts and internal resistance 0.125 Ω . The difference of potential at the terminal of battery when connected across an external resistance of 1 Ω is _____.

(a) 1.67 V (b) 0.67 V (c) 2.67 V (d) 3.67 V

73. A square aluminum rod is 1 m long and 5 mm on edge. What must be the radius of another aluminum rod whose length is 1 m and which has the same resistance as that of square Aluminum rod?

(a) 1.4 mm (b) 2.8 mm (c) 4.2 mm (d) 5.6 mm

74. Four resistances are connected to a 5V battery of negligible internal resistance as shown what is the potential across 2Ω?

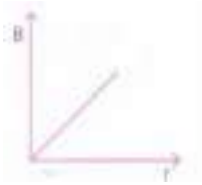
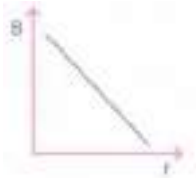
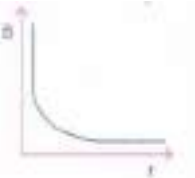
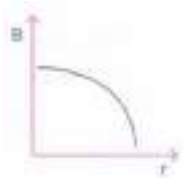


(a) 0.5 V (b) 1:5 V (c) 1.0 V (d) 1.0 V

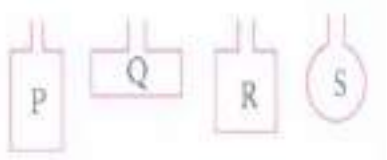
75. An unknown resistance is connected in parallel with a 15Ω resistance and a 12V battery. What is the value of the unknown resistance if the current in the circuit is 2A?

(a) 10Ω (b) 20Ω (c) 30Ω (d) 40Ω

76. Which of the following graphs shows the variation of magnetic induction B with distance 'r' from along wire carrying current?

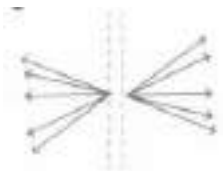
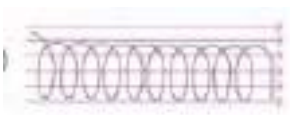
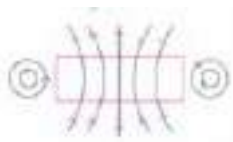
(a)  (b)  (c)  (d) 

77. Four wires each of length 2m are bent into four loops P, Q, R, and S, and then suspended into a uniform magnetic field as shown in the figure same current is passed in each loop. On which loop the couple will be the highest?



(a) P (b) Q (c) R (d) S

78. Which one of the following represents current magnetic field lines?

(a)  (b)  (c)  (d) 

79. The angle of dip at a place, when horizontal and vertical components of earth's field are equal is _____.

(a) 45° (b) 60° (c) 30° (d) 0°

80.The most suitable metal for permanent magnet is _____.

(a) copper (b) aluminium (c) steel (d) iron

81.When current is doubled deflection is also doubled in _____.

(a) moving coil galvanometer (b) tangent galvanometer (c) both of them
(d) neither of two

82.An electron of mass 0.90×10^{-30}kg under the action of a magnetic field moves in a circle of 2cm radius at a speed of 3×10^{6} m/s if a proton of mass 1.8×10^{-27} kg was to move in a circle of the same radius in the same magnetic field, then its speed will be _____.

(a) 3.0×10^{6} m/s (b) 1.5×10^{3} m/s (c) 6.0×10^{4} m/s
(d) cannot be estimated from the same data

83.A long straight conductor carrying a current lies along the axis of a ring. The conductor will exert a force on the ring if _____.

(a) carries a current (b) has uniformly distributed charge
(c) has non-uniformly distributed (d) none of the above

84.A current carrying conductor is associated with _____.

(a) electric field (b) magnetic field (c) electro magnetic (d) all these

85.The direction of the magnetic force on a positive charge moving in a magnetic field is given by _____.

(a) thumb rule (b) left hand rule (c) right hand rule (d) cork screw rule

86.If a current I is flowing in a straight wire parallel to the x-axis and magnetic field is in the y-axis then the wire experiences in _____.

(a) in Z-direction (b) in Y- direction (c) no force (d) in X- diection

87.Consider the motion of a charged particle in a uniform magnetic field directed into the paper. If velocity v of the particle is in the plane of the paper, the charged particle will describe a _____.

(a) straight line (b) circle (c) ellipse (d) hyperbola

88.Lorentz force generally refers to force experienced by a charge due to combined action of _____.

(a) magnetic fields (b) electric fields
(c) electric, magnetic & gravitational fields (d) electric and magnetic fields

89.Cyclotron is used to _____.

(a) accelerate charged particles or ions to low voltages
(b) decelerate charged particles or ions to high voltages
(c) accelerate charged particles or ions to high energies
(d) accelerate charged particles or ions to high voltages

90.The unit of magnetic field is _____.

(a) ampere-turn (b) ampere (c) newton coulomb (d) tesla

91.Match the following:

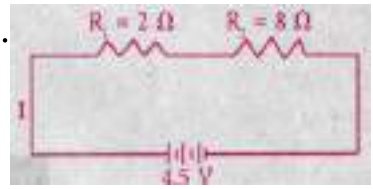
Column I	Column II
(a) Current	(i) Volt
(b) Resistance	(ii) farad
(c) Potential difference	(iii) mho
(d) Capacitance	(iv) ohm
	(V) ampere

(a) a b c d (i) (ii) (iv) (iii) (b) a b c d (v) (i) (ii) (iv) (c) a b c d (v) (iv) (i) (ii) (d) a b c d (iii) (iv) (v) (iv)

92.The current in the circuit is:

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

93.



In the above mentioned circuit the value of current I and voltage across $8\Omega\,(R_2)$ resistance is _____.

(a) 0.45 A, 18 V (b) 0.45 A, 36 V (c) 0.9 A, 72 V (d) 0.225 A, 9 V

94.The potential energy of magnetic dipole whose dipole moment is $\vec{p}_m = (-0.5\hat{i} + 0.4\hat{j})\text{Am}^2$ kept in uniform magnetic field $\vec{B} = 0.2\hat{i}$ T.

(a) –0.1 J (b) –0.8 J (c) 0.1 J (d) 0.8 J

95.Five balls marked as 1, 2, 3, 4 and 5 are suspended by separate threads. The pairs (1, 2),(2, 4) and (4, 1) show mutual attraction and the pairs (2, 3) and (4, 5) show repulsinon. The nature of ball marked as 1 is :

(a) Positive (b) negative (c) neutral (d) can't determine

96.If a current of 7.5 A is maintained in a wire for 45 s then the charge flowing through the wire is :

(a) 6 C (b) 365.5 C (c) 3 C (d) 337.5 C

97.For the fuse wire, which of the following characteristic is immaterial?

(a) Radius (b) Resistivity (c) Length (d) None of these

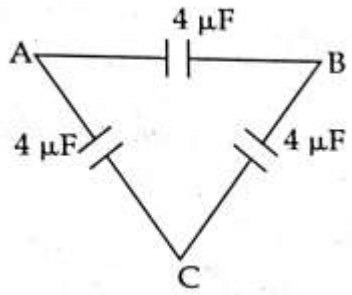
98.The resistance of a uniform wire of length l and cross-sectional area A is R. The resistance of wire of the same material having length 2l and cross sectional area 2A is:

(a) R (b) 2R (c) R/2 (d) R/4

99.The unit of electrical permittivity is

(a) $C^2N^{-1}m^{-2}$ (b) Nm^2C^{-1} (c) NC^{-1}

100.Three capacitors are connected in triangle as shown in figure. The equivalent capacitance between the points A and C is:



(a) 4 μF (b) 2 μF (c) 8 μF (d) 6 μF