CURRENT ELECTRICITY

1.A charged particle is released from rest in a region of steady and uniform electric and magnetic fields which are parallel to each other. The particle will move in a

(1) Straight line (2) circle (3) helix

(4) Cycloid

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- **Which of the following is analogous to momentum in electricity?**

(1) LI (2) VI (3) LQ (4) LC

3

- **A proton is projected horizontally eastward in a uniform magnetic field, which is horizontal southward in direction. The proton will be deflected**

(1) Upward (2) downward

(3) Northward (4) southward

4

- **The dimension of the magnetic field in M,L ,T and C (coulomb) is given as**

(1)$MT^{-1}C^{-1}$

(2)$MT^{-2}C^{-1}$

(3)$MLT^{-1}C^{-1}$

(4)$MT^{2}C^{-2}$

5. A charged particle moves through a magnetic field perpendicular to its direction then.

(1) Both momentum and kinetic energy of the particle are constant

(2)Both momentum and kinetic energy of the particle are constant

(3)Kinetic energy changes but the momentum is constant

(4)The momentum changes but the kinetic energy is constant.

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- **6. which of the following particles will describe smallest circle when projected perpendicular to a magnetic field?**

(1) Ne^+ **(2) He^+**

(3)proton **(4) electron**

a

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- In the circuit diagram, the readings of the ammeter and voltmeter are 2A and 120V respectively. If the value of R is 75Ω, then the voltmeter resistance will be
- (1) 100Ω (2) 150Ω
- (3) 300Ω (4) 75 Ω

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- **An electric current is passed through a circuit containing two wires of the same material connected in parallel. If the lengths and radii of the wires are in the raio 4/3 and 2/3, then the ratio of the currents passing through the wires will be**
- **(1) 8/9 (2) 1/3 (3) 3 (4) 2**

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- A long wire carries a steady current .It is bent in the form a circle of one turn and the magnetic field at the centre of the coil is B. It is then bent in to a circular loop of n turns. The magnetic field at the centre of the coil will be
- (1) 2nB (2) n^2B (3) nB (4) $2n^2B$

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

(1)- 2F/3 (2) F/3 (3)-2F (4) –F/3

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- **An ammeter reads up to 1 ampere. Its internal resistance is 0.81 ohm. To increase the range to 10 A the value of the required shunt (in ohm) is**

(1) 0.3 (2) 0.9 (3) 0.09 (4) 0.03

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- **If a wire of resistance is melted and re-casted to one fourth of its length, then the new resistance of the wire will become**
-
- **(1) 1/8th (2) ½ (3) 1/16th (4) 1/4th**

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- Two batteries one of emf 18 V and internal resistance 2Ω and other of emf 12V and internal resistance 1Ω are connected as shown in the figure. The reading of the voltmeter is
- (1) 30V (2) 18V (3) 15V (4)14V

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- The current in a circuit containing a resistance R is 5 amps. When an additional resistance of 3Ω is inserted the current decreases to 2 amp.
- The original resistance of the circuit (in ohm) is
- (1)3 (2) 4 (3)2 (4) 6

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A uniform conductor of resistance R is cut into 20equal pieces. Half of them is joined in series and the remaining half of them are connectedin parallel. If the two combinations are joined in series, the effective resistance of all the pieces will be

- **(1) R (2) R/2 (3) 101R/200(4)201/200**

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- **A conductor of resistance 2Ω is stretched uniformly till its length is doubled. The wire is now bent in the form of a circle. The effective resistance between the any two points which are 1/4the circumference apart is**
- **(1) 1.33Ω 2) 2 Ω (3) 0.75 Ω (4) 1.5 Ω**

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- **In the hydrogen atom the electron moves around the proton with a speed of 2.0×10^{6} ms^{-1} in a circular orbit of radius 5.0×10^{-11} m. what is equivalent dipole moment?**

(1) 2×10^{-24} Am^2 **(2)** 4×10^{-24} Am^2

(3) 8×10^{-24} Am^{-2} **(4)** 16×10^{-24} Am^2

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- An alternating voltage (in volts) is given by $V=200\sqrt{2}\sin(100t)$ is connected to a 1μF capacitor through an ac ammeter. The reading of the ammeter will be

- (1) 10mA (2) 20mA (3) 40mA (4) 80mA

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An inductive coil has a resistance of 10Ω.when an ac signal of frequency 100Hz is fed to the coil, the applied voltage leads the current by 45^0. What is the inductance of the coil?

- (1)10 mH (2) 12mH (3) 16mH (4) 20mH

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In an ac circuit the potential difference V and current are given respectively by V=100 sin (100t) volt and I=100 sin (100t +60^0) mA. The power dissipated in the circuit will be

(1)10^4 W (2) 10W (3) 2.5 W (4) 5W.

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- **An electric heater consumes 500W when connected to a 100V line. If the line voltage becomes 150V, the power consumed will be**

(1) 500W (2)750 W

(2) (3) 1000W (4) 1125W

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- **A current of 1A is passed through a coil across which is a potential difference of 210V. The coil which embedded in ice. Then the ice that melts per hour is**

- **(1) 2.5 kg (2) 2.1 kg (3) 3kg (4) 4.2kg**

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- **An electric cable of copper has just one wire of radius 9mm. Its resistance is 5 ohms. This single copper wire of the cable is replaced by six different well insulated copper wires each of radius 3mm. the total resistance of the cable will now be equal to**
- **(1) 7.5 Ω (2) 45Ω (3) 90 Ω (4) 270Ω**

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- **A 90W-30V bulb is to be light by a supply of 120 volt. For this a wire is to be connected in series with it. The resistance of the wire be**
-
- **(1) 20 Ω(2) 30 Ω (3) 10 Ω (4) 40 Ω**
-

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- **A conductor of resistance of 3Ω is stretched uniformly till its length is doubled. The wire is now bent in the form of an equilateral triangle. The effective resistance between the ends of any side of the triangle in ohms is**
- (1) 9/2 (2)8/3 (3) 2 (4) 1

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- **An electron in the potentiometer wire experiences a force of 3.2×10^{-19} N. the length of the potentiometer wire is 4m. The emf of the battery across the wire is**
- **(1) 3.2V (2) 1.6V (3) 4.8V (4) 8V**

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- **If two bulbs of 25W and 100W respectively each rated at 220V connected in series with a supply of 440V, which bulb will glow brighter?**
- **(1)25W bulb (2)100W bulb (3) bothwith same brightness bulbs (4)first 25W bulb and then 100W bulb**

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- **The resistance of the coil of an ammeter is R. the shunt required to increase its range four-fold should have a resistance;**

- **(1) R/3 (2) R/4 (3)4R (4) R/5**

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- Two particles accelerated with same voltage enter a uniform magnetic field perpendicularly the radii of the circular Paths are R_1 and R_2, the charge on the particles is same, the ratio of m_1/m_2 is
- (1)$(R_2/R_1)^2$ (2) R_2/R_1
- (3) R_1/R_2 (4) $(R_1/R_2)^2$

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An electron moving toward the east enters a magnetic field directed towards the north. The force on the electron will be directed:

- **(1) Vertically upward**
- **(2) vertically downward**
- **(3)towards the west**
- **(4) towards south**

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- If only 2% of the main current is to be passed through a galvanometer of resistance G then the resistance of the shunt will be
- (1)G/50 (2) G/49
- (3) 50G (4) 49
-

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- **A coil is placed in transverse magnetic field of 0.02T. This coil starts shrinking at a rate of 1mm/sec. when its radius is 4cm, then what is the value if the induced emf.**
- **(1) 2μV (2) 2.5μV**
  (3) 5μV (4) 8μV

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- On connecting a battery to the two corners of a diagonal of a square conductor frame of side ‘a’ , the magnitude of the magnetic field at the centre will be
- (1) zero (2) $\mu_0/\pi a$
- (3) $2\ \mu_0/\pi a$ (4)$4\ \mu_0/\pi a$

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- **34.A wire of length carrying a current i is bent in the form a circle . The magnitude of the magnetic moment is**
-
- **(1) $iL^2/4\pi$ (2) $iL^2/2\pi$**
- **(3) $iL/4\pi$ (4) πiL^2**

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- **A coil and a bulb are connected in series with an AC source. If a soft iron rod is inserted in to the inductive coil, the intensity of the bulb will become**
-
- **(1) dim (2) intense**
- **(3) unchanged (4)go out**

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- **The resistance of a wire is 10 ohm. It is drawn in order to increase its length by 10%.the new resistance of the wire will be**
-
- **(1)11 Ω (2)8 Ω**
- **(3)12 Ω (4)15 Ω**

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- In the following figure, circuit of wheat stone's bridge is represented. When the ratio arms P and Q are almost equal then the bridge gets balanced at R=400Ω .If P and Q are mutually interchanged then the bridge gets balanced at R=441Ω. The value of unknown resistance X will be
- (1) 402.Ω (2) 403 Ω (3) 404Ω (4) 420Ω

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- A student connects four cells ,each of internal resistance 1/4Ω in series. One of *the* cells is incorrectlyconnected because its terminals are reversed. The value of external resistance is 1 Ω. If the emf of each cell is 1.5 volt, then current in the circuit is
- (1)4/3 A (2) zero (3)3/4 A (4) 1.5 A

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- **The potential difference between the ends of 4 Ω resistance in the given circuit is**
-

(1) 1.2V (2)2.6V (3)6.4V (4) 4.8V

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- **A wire emits 80J of energy in 10 seconds when a current of 2A is passed through it. The resistance of the wire in ohms will be**
-
- **(1) 0.5 (2) 2 (3) 4 (4)20**

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- A battery of 15V and of negligible internal resistance is connected to the
- Rheostat XZ of 1kΩ. The resistance of Yz part is 500 .the reading of the ammeter will be.
- 1A (2) 0.1A (3) 0.01A (4) 0.001 A

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- **The potential difference between the points A and B in the adjoining diagram will be**
- **(1) PQ/P+Q (2)PQ/P-Q**
- **(3) P+Q (4) P-Q**

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- **43. A bulb rated 4.5W, 1.5V is connected as shown in the figure. The emf of the cell needed to make the bulb glow at full intensity is**

- **(1) 4.5V (2)1.5V (3)2.67V (4) 13.5V**

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- **For drawing a current of 2A for 6 minutes in a circuit 1000J of work is to be done. The emf of the source in the circuit is**

(1) 3.10V (2)2.03V (3)1.68V (4) 1.38 V

45.

- **The internal resistance of a cell of emf is 0.1Ω. It is connected to a resistance of 3.9Ω. the voltage across the cell will be**
- **(1) 0.52V (2) 1.68V**
- **(3) 1.95V (4) 2.71V**

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- When a resistance of 2Ω is connected across the terminals of a cell. The current is 0.5A. But when the resistance across the cell is 5Ω, the current is 0.25A. The emf of the cell is
- (1)2.0V(2)1.0V (3)1.5V (4) 0.5V

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- A wire is stretched so that its radius becomes one-third of the original value. The value of the resistance as compared to original value is
-
- (1) 9:1 (2) 27:1 (3) 81:1 (4) 3:1
-

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- A battery supplies 150W and 196W power to two resistors of 6Ωand 4Ω when they are connected separately to it. The internal resistance of the battery is
-
- (1)2.5 Ω (2) 2 Ω (3) 1 Ω (4) 0.5 Ω

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- A voltmeter has a resistance of 20K. When it is connected in series with a
- Resistance R across 230V supply it reads 200V.what is the value of R?
-
- (1) 2kΩ (2) 3kΩ (3) 4kΩ (4)1k Ω

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- **Three conductors draw currents 1A,3A and 6A when connected to a battery of negligible internal resistance in turn. If they are connected in series across the same battery, the current drawn will be**
- **(1) 3/2 A(2) 2/3A (3) 4/3A (4) 5/3 A**