

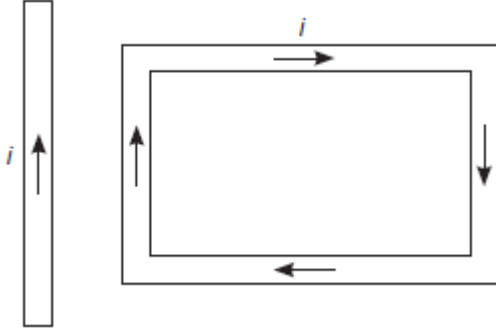
# O P JINDAL SCHOOL, SAVITRINAGAR

## CLASS TEST & PRACTICE

CLASS XII PHYSICS

TOPIC : MOVING CHARGES AND MAGNETISM

- 1 A rectangular loop carrying a current  $i$  is situated near a long straight wire such that the wire is parallel to the one of the sides of the loop and is in the plane of the loop. If a steady current  $I$  is established in wire as shown in figure, the loop will



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- (a) rotate about an axis parallel to the wire.  
(b) move away from the wire or towards right.  
(c) move towards the wire.  
(d) remain stationary.
- 2 A circular coil of radius 4 cm and of 20 turns carries a current of 3 amperes. It is placed in a magnetic field of intensity of  $0.5 \text{ weber/m}^2$ . The magnetic dipole moment of the coil is
- (a)  $0.15 \text{ ampere-m}^2$  (b)  $0.3 \text{ ampere-m}^2$   
(c)  $0.45 \text{ ampere-m}^2$  (d)  $0.6 \text{ ampere-m}^2$
- 3 A cubical region of space is filled with some uniform electric and magnetic fields. An electron enters the cube across one of its faces with velocity  $v$  and a positron enters via opposite face with velocity  $-v$ . At this instant,
- (a) the electric forces on both the particles cause identical accelerations.  
(b) the magnetic forces on both the particles cause equal accelerations.  
(c) Only electron gains or loses energy.  
(d) the motion of the centre of mass (CM) is determined by  $E$  alone.
- 4 Consider a wire carrying a steady current,  $I$  placed in a uniform magnetic field  $B$  perpendicular to its length. Consider the charges inside the wire. It is known that magnetic forces do not work. This implies that,
- (a) motion of charges inside the conductor is unaffected by  $B$ , since they do not absorb energy.  
(b) Some charges inside the wire move to the surface as a result of  $B$ .  
(c) if the wire moves under the influence of  $B$ , no work is done by the force.  
(d) If the wire moves under the influence of  $B$ , no work is done by the electric force on the ions, assumed fixed within the wire.

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- 5 Two identical current carrying coaxial loops, carry current  $I$  in an opposite sense. A simple amperian loop passes through both of them once. Calling the loop as  $C$ ,

(a)  $\oint_C B \cdot dl = \pm 2\mu_0 I$ .

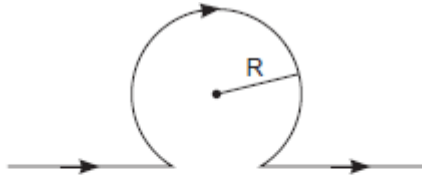
(b) the value of  $\oint_C B \cdot dl$  is independent of sense of  $C$ .

(c) there may be a point on  $C$  where,  $B$  and  $dl$  are parallel.

(d)  $B$  vanishes everywhere on  $C$ .

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- 6 The strength of magnetic field at the centre of circular coil is



(a)  $\frac{\mu_0 I}{R} \left(1 - \frac{1}{\pi}\right)$

(b)  $\frac{\mu_0 I}{\pi R}$

(c)  $\frac{\mu_0 I}{2R} \left(1 - \frac{1}{\pi}\right)$

(d)  $\frac{\mu_0 I}{2R} \left(1 + \frac{1}{\pi}\right)$

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- 7 If a charged particle moves through a magnetic field perpendicular to it

(a) both momentum and energy of particle change.

(b) momentum as well as energy are constant.

(c) energy is constant but momentum changes.

(d) momentum is constant but energy changes.

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- 8 A current carrying closed loop of an irregular shape lying in more than one plane when placed in uniform magnetic field, the force acting on it

(a) will be more in the plane where its larger position is covered.

(b) is zero.

(c) is infinite.

(d) may or may not be zero.

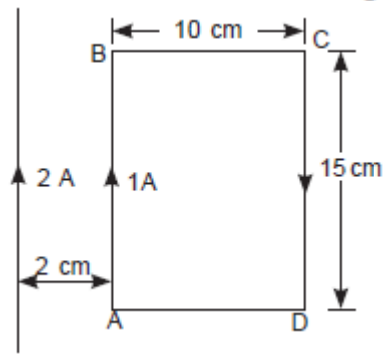
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- 9 The maximum current that can be measured by a galvanometer of resistance  $40 \Omega$  is  $10 \text{ mA}$ . It is converted into voltmeter that can read upto  $50 \text{ V}$ . The resistance to be connected in the series with the galvanometer is

(a)  $2010 \Omega$  (b)  $4050 \Omega$

(c)  $5040 \Omega$  (d)  $4960 \Omega$

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What is the net force on the rectangular coil?

(a)  $25 \times 10^{-7}$

N towards wire.

(b)  $25 \times 10^{-7}$  N away from wire.

(c)  $35 \times 10^{-7}$  N towards wire.

(d)  $35 \times 10^{-7}$  N away from wire.