CBSE NCERT Based Chapter wise Questions (2025-2026)

Class-XII

Subject: Physics

Chapter Name : Magnetic Effect of Current (Chap : 4)

Total : 6 Marks (expected) [MCQ(2)-2, Assertion-Reason-(1)-2, SA-II(1)-2 Marks, VSA-II(1)-3 Marks]

Level - 1

MCQ Type :

1. A straight wire is kept horizontally along east-west direction. If a steady current flows in the wire from east to west, the magnetic field at a point above the wire will point towards.

Ⓐ east Ⓑ west Ⓒ north Ⓓ south

2. A piece of wire bent in the form of a circular loop A carries a current I. The wire is then bent into a circular loop B of two turns and carries the same current. The ratio of magnetic fields at the centre of loop A to that of the loop B will be

Ⓐ $\frac{1}{16}$ Ⓑ 16 Ⓒ 4 Ⓓ $\frac{1}{4}$

3. The magnetic field at the centre of current carrying circular loop is B. The magnetic field at a distance of $\sqrt{3}$ times radius of the given circular loop from the centre on its axis is B_2. The value of $\frac{B_1}{B_2}$ will be

Ⓐ 9 : 4 Ⓑ $12:\sqrt{5}$ Ⓒ 8 : 1 Ⓓ $5:\sqrt{3}$

4. A long straight wire of radius 'a' carries a steady current I. The current is uniformly distributed across its area of cross section. The ratio of magnitudes of magnetic fields B, at $\frac{a}{2}$ and B_2 at a distance 2a from the axis of the wire is

Ⓐ $\frac{1}{2}$ Ⓑ 1 Ⓒ 2 Ⓓ 4

5. The radius of the circular path of an electron moving in magnetic field perpendicular to its path is equal to

Ⓐ $\frac{Be}{mV}$ Ⓑ $\frac{me}{\beta}$ Ⓒ $\frac{mE}{\beta}$ Ⓓ $\frac{mV}{\beta e}$

6. What uniform magnetic field applied perpendicular to a beam of electrons moving at 1.3×10^6 ms^{-1} is required to make the electrons travel in a circular arc of radius 0.35 m

Ⓐ 2.1×10^{-5} G Ⓑ 6×10^{-5} G Ⓒ 2.1×10^{-5} T Ⓓ 6×10^{-5} G

7. A charge Q is moving distance dl in the magnetic field $\vec{B}$. Find the value of work done by $\vec{B}$

Ⓐ –1 Ⓑ zero Ⓒ 1 Ⓓ infinity

8. Which particle will have minimum frequency of revolution when projected with the same velocity perpendicular to magnetic field?

Ⓐ Li^+ Ⓑ electron Ⓒ proton Ⓓ He^+

9. A charged particle is moving in a uniform field $\left(2\hat{i} + 3\hat{j}\right)$T. If it has an acceleration of $\left(\alpha\hat{i} - 4\hat{j}\right)ms^{-2}$, then value of α will be

Ⓐ 3 Ⓑ 6 Ⓒ 12 Ⓓ 2

10. A current of 200 μA deflects the coil of a moving coil galvanometer through 60°. The current to cause deflection through $\frac{\pi}{10}$ radian is

Ⓐ 30 μA Ⓑ 120 μA Ⓒ 60 μA Ⓓ 180 μA

Assertion and Reason :

Directions: Read the following questions and choose any one of the following four responses.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.

B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.

C: Assertion is correct but Reason is wrong.

D: Assertion is wrong but Reason is correct.

1. **Assertion (A) :** Two long parallel wires, freely suspended and connected in series to a battery, move apart.
   Reason (R) : Two wires carrying current in opposite directions repel each other.
   Ⓐ A Ⓑ B Ⓒ C Ⓓ D

2. **Assertion (A) :** An electric field is preferred in comparison to magnetic field for detecting the electron beam in a television tube.
   Reason (R) : electric field requires low voltage.
   Ⓐ A Ⓑ B Ⓒ C Ⓓ D

3. **Assertion (A) :** Magnetic field interacts with a moving charge and not with a stationary charge.
   Reason (R) : A moving charge produces a magnetic field.
   Ⓐ A Ⓑ B Ⓒ C Ⓓ D

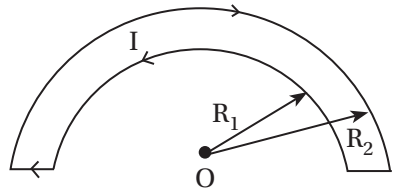
4. **Assertion (A) :** The resistance of an ideal voltmeter should be infinite.
   Reason (R) : The lower resistance of voltmeter gives a reading lower than the actual potential difference across the terminals.
   Ⓐ A Ⓑ B Ⓒ C Ⓓ D

Very Short Answer Questions :

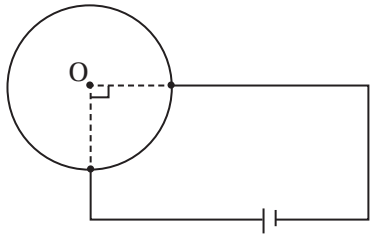
1. State Biot–Savart's law. How will you find the direction of the magnetic field.
2. Briefly explain why and how a galvanometer is converted into an ammeter.
3. Write two factors by which voltage sensitivity of a moving coil galvanometer can be increased.
4. Under what circumstances will a current carrying loop not rotate in the magnetic field.
5. Derive an expression for the force between two parallel short wires carrying currents.

Short Answer Questions :

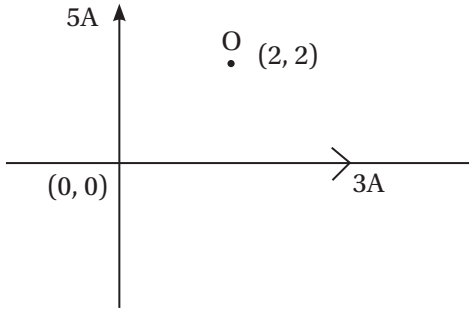
1. Find the magnetic field (with direction) at the point O for follow diagram.



2. Find the magnetic field (with direction) at the point O for follow diagram

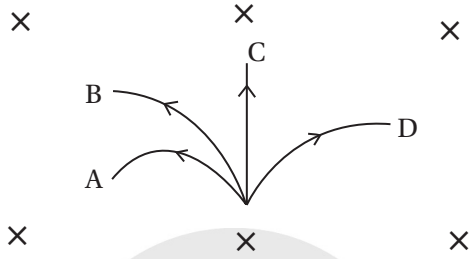


3. Find the magnetic field (with direction) at the point O for follow diagram



4. Show that the magnetic field along the axis of a current carrying circular coil of radius r at a distance x from the centre of the coil is smaller by the fraction $\frac{3x^2}{2r^2}$ than the field at the centre of the coil carrying current.

5. A neutron, a proton, an electron and an a particle enter a region of constant magnetic field with equal velocities. The tracks of the particles given in the following diagram. Identify the particle.



ANSWER

MCQs

1. Ⓒ	**3.** Ⓒ	**5.** Ⓓ	**7.** Ⓑ	**9.** Ⓑ
2. Ⓓ	**4.** Ⓑ	**6.** Ⓒ	**8.** Ⓐ	**10.** Ⓒ

Assertion-Reason

1. Ⓐ	**2.** Ⓓ	**3.** Ⓐ	**4.** Ⓐ	

1. $\frac{\mu_o I}{4}\left(\frac{1}{R_1}-\frac{1}{R_2}\right)$(upward)
2. Zero
3. 2×10^{-7} T (downward)