

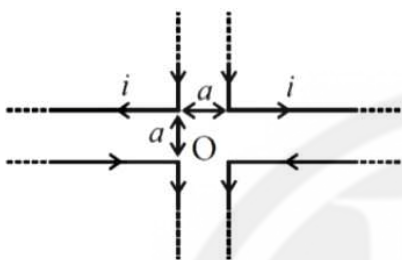
Prayas JEE (2025)

Physics

Magnetism

DPP: 7

- Q1** Four infinitely long L shaped wires, each carrying a current I have been arranged as shown in the figure, Obtain the magnetic field intensity at the point O equidistant from all the four corners.



- (A) 1wb/m^2
 (B) 0wb/m^2
 (C) 2wb/m^2
 (D) none of these

- Q2** If number of turn, area and current through the coil is given by n , A and i respectively then its magnetic moment will be

- (A) $ni A$
 (B) n^2iA
 (C) niA^2
 (D) $\frac{ni}{\sqrt{A}}$

- Q3** A wire of length L metre carrying a current of I ampere is bent in the form of a circle. Its magnitude of magnetic moment will be

- (A) $\frac{IL}{4\pi}$
 (B) $\frac{IL^2}{4\pi}$
 (C) $\frac{I^2L^2}{4\pi}$

(D) $\frac{I^2L}{4\pi}$

Q4

A magnet of magnetic moment $50i \text{ A} - \text{m}^2$ is placed along the x -axis in a magnetic field $\vec{B} = (0.5i + 3.0j)\text{T}$. The torque acting on the magnet is

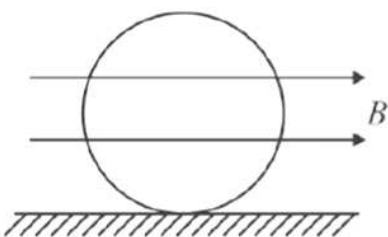
- (A) $175k \text{ N} - \text{m}$
 (B) $150k \text{ N} - \text{m}$
 (C) $75k \text{ N} - \text{m}$
 (D) $25\sqrt{37}k \text{ N} - \text{m}$

- Q5** A conducting circular loop of radius r carries a constant current i . It is placed in a uniform magnetic field \vec{B} such that \vec{B} is perpendicular to the plane of the loop. The magnetic force acting on the loop is

- (A) $\rightarrow ir B$
 (B) $2\pi riB$
 (C) Zero
 (D) $\rightarrow \pi riB$

- Q6** A conducting ring of mass 2 kg and radius 0.5 m is placed on a smooth horizontal plane. The ring carries a current of $i = 4 \text{ A}$. A horizontal magnetic field $B = 10\text{T}$ is switched on at time $t = 0$ as shown in Fig. The initial angular acceleration of the ring will be


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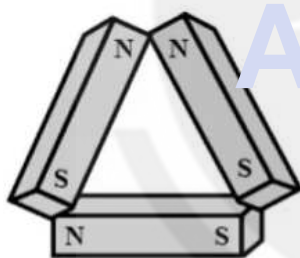


- (A) $40\pi \text{ rad s}^{-2}$
 (B) $20\pi \text{ rad s}^{-2}$
 (C) $5\pi \text{ rad s}^{-2}$
 (D) $15\pi \text{ rad s}^{-2}$

Q7 A magnet of magnetic moment M and pole strength m is divided in two equal parts, then magnetic moment of each part will be

- (A) M (B) $M/2$
 (C) $M/4$ (D) $2M$

Q8 Three identical bar magnets each of magnetic moment M are placed in the form of an equilateral triangle as shown.



The net magnetic moment of the system is

- (A) Zero
 (B) $2M$
 (C) $M\sqrt{3}$
 (D) $3M/2$

Q9 A bar magnet when placed at an angle of 30° to the direction of magnetic field induction of $5 \times 10^{-2} \text{ T}$, experiences a moment of couple $25 \times 10^{-6} \text{ N - m}$. If the length of the magnet is 5 cm its pole strength is

- (A) $2 \times 10^{-2} \text{ A - m}$
 (B) $5 \times 10^{-2} \text{ A - m}$

(C) 2 A - m

(D) 5 A - m



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Answer Key

Q1 B
Q2 A
Q3 B
Q4 B
Q5 C

Q6 A
Q7 B
Q8 B
Q9 A



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