

JEE MAIN MOVING CHARGES AND MAGNETISM — TORQUE ON A CURRENT LOOP, MAGNETIC DIPOLE MOMENT — PYQS

Max. Marks: 20

Questions: 5

Section A (MCQ) — 3 questions

- Q.1** A current carrying circular loop of radius 2 cm with unit normal $\hat{n} = \frac{\hat{k} + \hat{i}}{\sqrt{2}}$ is placed in a magnetic field, $\vec{B} = B_0(3\hat{i} + 2\hat{k})$. If $B_0 = 4 \times 10^{-3}$ T and current $I = 100\sqrt{2}$ A, the torque experienced by the loop is _____ Wb.A. ($\pi = 3.14$)

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) $16 \times 10^{-5} \hat{k}$ (2) $5024 \times 10^{-7} \hat{k}$
(3) $5024 \times 10^{-7} \hat{i}$ (4) $5024 \times 10^{-7} \hat{j}$

Scan or tap for the full solution



- Q.2** An insulated wire is wound so that it forms a flat coil with $N = 200$ turns. The radius of the innermost turn is $r_1 = 3$ cm, and of the outermost turn $r_2 = 6$ cm. If 20 mA current flows in it then the magnetic moment will be $\alpha \times 10^{-2}$ A m². The value of α is _____. [JEE Main 2026 (Online) 4th April Morning Shift]
- (1) 4.4 (2) 2.64 (3) 3.25 (4) 1.2

Scan or tap for the full solution



- Q.3** A uniform magnetic field of 2×10^{-3} T acts along positive Y-direction. A rectangular loop of sides 20 cm and 10 cm with current of 5 A is in Y – Z plane. The current is in anticlockwise sense with reference to negative X axis. Magnitude and direction of the torque is:

[JEE Main 2024 (Online) 31st January Evening Shift]

- (1) 2×10^{-4} N – m along negative Z-direction
(2) 2×10^{-4} N – m along positive X-direction
(3) 2×10^{-4} N – m along positive Y-direction
(4) 2×10^{-4} N – m along positive Z-direction

Scan or tap for the full solution



Section B (Numerical) — 2 questions

- Q.4** A circular coil of radius 2 cm and 125 turns carries a current of 1 A. The coil is placed in a uniform magnetic field of magnitude 0.4 T. The axis of the coil makes an angle of 30° with the direction of the magnetic field. The torque acting on the coil is $\alpha \times 10^{-4}$ N m. The value of α is _____. ($\pi = 3.14$)

[JEE Main 2026 (Online) 4th April Evening Shift]

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- Q.5** A coil having 100 turns, area of 5×10^{-3} m², carrying current of 1 mA is placed in uniform magnetic field of 0.20 T such a way that plane of coil is perpendicular to the magnetic field. The work done in turning the coil through 90° is _____ μ J.

[JEE Main 2024 (Online) 6th April Evening Shift]

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ANSWER KEY

Section A (MCQ) — 3 questions

Ques.	1	2	3							
Ans.	4	2	1							

Section B (Numerical) — 2 questions

Ques.	4	5					
Ans.	314	100					