

PYQSide

JEE MAIN ELECTROMAGNETIC INDUCTION — FARADAY'S LAWS OF INDUCTION — PYQS

Max. Marks: 24

Questions: 6

Section A (MCQ)

- Q.1** A square loop of side 2 cm is placed in a time varying magnetic field with magnitude as $B = 0.4\sin(300t)$ Tesla. The normal to the plane of loop makes an angle of 60° with the field. The maximum induced emf produced in the loop is _____ mV.

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) 12 (2) 18 (3) 21 (4) 24

Scan or tap for the full solution



- Q.2** When a coil is placed in a time dependent magnetic field the power dissipated in it is P . The number of turns, area of the coil and radius of the coil wire are N , A and r respectively. For a second coil number of turns, area of the coil and radius of the coil wire are $2N$, $2A$ and $3r$ respectively. When the first coil is replaced with second coil the power dissipated in it is $\sqrt{2} \alpha P$. The value of α is _____.

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 36 (2) $128\sqrt{2}$
(3) 16 (4) 64

Scan or tap for the full solution



- Q.3** A circular loop of radius 7 cm is placed in uniform magnetic field of 0.2 T directed perpendicular to plane of loop. The loop is converted into a square loop in 0.5 s. The EMF induced in the loop is _____ mV.

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) 13.2 (2) 6.6 (3) 1.32 (4) 8.25

Scan or tap for the full solution



- Q.4** Suppose a long solenoid of 100 cm length, radius 2 cm having 500 turns per unit length, carries a current $I = 10\sin(\omega t)$ A, where $\omega = 1000$ rad/s. A circular conducting loop (B) of radius 1 cm coaxially slid through the solenoid at a speed $v = 1$ cm/s. The r.m.s. current through the loop when the coil B is inserted 10 cm inside the solenoid is $\frac{\alpha}{\sqrt{2}} \mu\text{A}$. The value of α is _____.

[Resistance of the loop = 10Ω]

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) 80 (2) 280 (3) 100 (4) 197

Scan or tap for the full solution



- Q.5** A conducting circular loop of area 1.0 m^2 is placed perpendicular to a magnetic field which varies as $B = \sin(100t)$ Tesla. If the resistance of the loop is 100Ω , then the average thermal energy dissipated in the loop in one period is _____ J.

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) π^2 (2) $\frac{\pi}{2}$ (3) π (4) 2π

Scan or tap for the full solution



Section B (Numerical)

- Q.6** A circular loop of radius 20 cm and resistance 2Ω is placed in a time varying magnetic field $\vec{B} = (2t^2 + 2t + 3) \text{ T}$. At $t = 0$, for the plane of the loop being perpendicular to the magnetic field and, the induced current in the loop at $t = 3 \text{ s}$ is $\frac{\alpha}{50} \text{ A}$. The value of α is _____.
(Take $\pi = 22/7$)

[JEE Main 2026 (Online) 5th April Evening Shift]

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ANSWER KEY**Section A (MCQ)**

Ques.	1	2	3	4	5						
Ans.	4	1	3	4	3						

Section B (Numerical)

Ques.	6										
Ans.	44										