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JEE MAIN ELECTROMAGNETIC INDUCTION — MUTUAL INDUCTANCE — PYQS

Max. Marks: 8 **Questions:** 2

Section A (MCQ) — 2 questions

Q.1 A circular current loop of radius R is placed inside square loop of side length L ($L \gg R$) such that they are co-planar and their centers coincide. The permeability of free space is μ_0. The mutual inductance between circular loop and square loop is _____. [JEE Main 2026 (Online) 2nd April Evening Shift]

(1) $2\sqrt{2}\frac{\mu_0 L^2}{R}$ (2) $\sqrt{2}\frac{\mu_0 L^2}{R}$

(3) $\sqrt{2}\frac{\mu_0 R^2}{L}$ (4) $2\sqrt{2}\frac{\mu_0 R^2}{L}$

Scan or tap for the full solution

Q.2 Consider I_1 and I_2 are the currents flowing simultaneously in two nearby coils 1 & 2, respectively. If L_1 = self inductance of coil 1, M_{12} = mutual inductance of coil 1 with respect to coil 2, then the value of induced emf in coil 1 will be : [JEE Main 2025 (Online) 29th January Morning Shift]

(1) $e_1 = -L_1\frac{dI_2}{dt} - M_{12}\frac{dI_1}{dt}$

(2) $e_1 = -L_1\frac{dI_1}{dt} + M_{12}\frac{dI_2}{dt}$

(3) $e_1 = -L_1\frac{dI_1}{dt} - M_{12}\frac{dI_1}{dt}$

(4) $e_1 = -L_1\frac{dI_1}{dt} - M_{12}\frac{dI_2}{dt}$

Scan or tap for the full solution

ANSWER KEY

Ques.	1	2									
Ans.	4	4									