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JEE MAIN ALTERNATING CURRENT — POWER IN AC CIRCUITS, POWER FACTOR AND WATTLESS CURRENT — PYQS

Max. Marks: 16 **Questions:** 4

Section A (MCQ) — 2 questions

Q.1 A LCR series circuit driven with E_{rms} = 90 V at frequency f_d = 30 Hz has resistance R = 80 Ω, an inductance with inductive reactance X_L = 20.0 Ω and capacitance with capacitive reactance X_C = 80.0 Ω. The power factor of the circuit is _____. [JEE Main 2026 (Online) 6th April Morning Shift]

(1) 0.8 (2) 0.64 (3) 0.9 (4) 0.5

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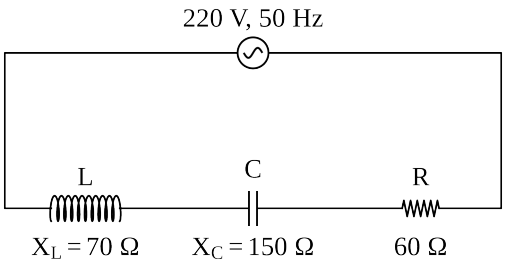
Q.2 For the series LCR circuit connected with 220 V, 50 Hz a.c. source as shown in the figure, the power factor is $\frac{\alpha}{10}$. The value of α is _____.

[JEE Main 2026 (Online) 24th January Morning Shift]



(1) 4 (2) 8 (3) 6 (4) 10

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Section B (Numerical) — 2 questions

Q.3 An inductor of 10 mH, capacitor of 0.1 μF and a resistor of 100 Ω are connected in series across an a.c. power supply 220 V, 70 Hz. The power factor of the given circuit is 0.5. The difference in the inductive reactance and capacitive reactance is $\sqrt{3}\,\alpha$ Ω. The value of α is _____.

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

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Q.4 An inductor of reactance 100 Ω, a capacitor of reactance 50 Ω, and a resistor of resistance 50 Ω are connected in series with an AC source of 10 V, 50 Hz. Average power dissipated by the circuit is _____ W.

[JEE Main 2025 (Online) 7th April Evening Shift]

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ANSWER KEY

Section A (MCQ) — 2 questions

Ques.	1	2									
Ans.	**1**	**3**									

Section B (Numerical) — 2 questions

Ques.	3	4					
Ans.	**100**	**1**					