

Alternating Current

NEET previous year questions · Physics

5 questions from the official papers: NEET 2026 (2), Re-NEET 2026 (1), NEET 2020 (2). Each is followed by its answer and a worked solution written by BrainIt. Generated on 23 October 2026.



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1. NEET 2026 · Q19

An ac circuit contains a resistance of $1\text{ k}\Omega$, a capacitor of $0.1\text{ }\mu\text{F}$ and an inductor of 1 mH connected in series. The resonance frequency of the circuit is approximately:

- (1) 13.5 kHz (2) 10.1 kHz
(3) 20.7 kHz (4) 15.9 kHz

Answer (4)

Sol. Series resonance occurs at $f_0 = \frac{1}{2\pi\sqrt{LC}}$, which is independent of the resistance. With $L = 1\text{ mH} = 10^{-3}\text{ H}$ and $C = 0.1\text{ }\mu\text{F} = 10^{-7}\text{ F}$, $f_0 = \frac{1}{2\pi\sqrt{10^{-10}}} = \frac{1}{2\pi \times 10^{-5}} \approx 15.9\text{ kHz}$ (option (4)). The resistance value is a distractor since it does not enter the resonance formula.

2. NEET 2026 · Q38

The peak value of an alternating current is 5 A and frequency is 60 Hz . How long will the current, starting from zero, take to reach the peak value?

- (1) $\frac{1}{120}\text{ s}$ (2) $\frac{1}{60}\text{ s}$
(3) $\frac{1}{30}\text{ s}$ (4) $\frac{1}{240}\text{ s}$

Answer (4)

Sol. With $i = i_{\text{peak}} \sin(\omega t)$ and $\omega = 2\pi f = 120\pi\text{ rad/s}$, the current first equals its peak when $\sin(\omega t) = 1$, i.e. $\omega t = \pi/2$. This gives $t = \frac{1}{4f} = \frac{1}{4 \times 60} = \frac{1}{240}\text{ s}$ (a quarter of the period).

3. Re-NEET 2026 · Q30

An ac voltage $V = 220 \sin(2 \times 10^3 t)$ Volt is applied to a series LCR circuit. Then the current amplitude in this circuit is: (Given : $L = 10\text{ mH}$, $C = 25\text{ }\mu\text{F}$, $R = 100\text{ }\Omega$)

- (1) 2.2 A (2) 5.5 A (3) 11.0 A (4) 22.0 A

Answer (1)

Sol. With $\omega = 2 \times 10^3\text{ rad s}^{-1}$, the reactances are $X_L = \omega L = 20\text{ }\Omega$ and $X_C = \frac{1}{\omega C} = 20\text{ }\Omega$. Since $X_L = X_C$ the circuit is at RESONANCE, the reactances cancel and the impedance reduces to $Z = R = 100\text{ }\Omega$. The current amplitude is then $I_0 = \frac{V_0}{Z} = \frac{220}{100} = 2.2\text{ A}$. NCERT Class 12, Alternating Current (LCR series circuit and resonance).

4. NEET 2020 · Q136

A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is $\pi/3$. If instead C is removed from the circuit, the phase difference is again $\pi/3$ between current and voltage. The power factor of the circuit is

- (1) 0.5 (2) 1.0 (3) -1.0 (4) zero

Answer (2)

Sol. For the RC circuit, $\tan(\pi/3) = X_C/R$; for the RL circuit, $\tan(\pi/3) = X_L/R$. Hence $X_L = X_C$ in the complete series circuit, so it is at resonance and its power factor is $\cos 0 = 1$. Chapter: Alternating Current.

5. NEET 2020 · Q147

A $40\text{ }\mu\text{F}$ capacitor is connected to a 200 V , 50 Hz ac supply. The rms value of the current in the circuit is, nearly

- (1) 2.05 A (2) 2.5 A (3) 25.1 A (4) 1.7 A

Answer (2)

Sol. For a capacitor, $I = V(2\pi fC) = 200 \times 2\pi \times 50 \times 40 \times 10^{-6} \approx 2.51 \text{ A}$, matching 2.5 A. Chapter: Alternating Current.

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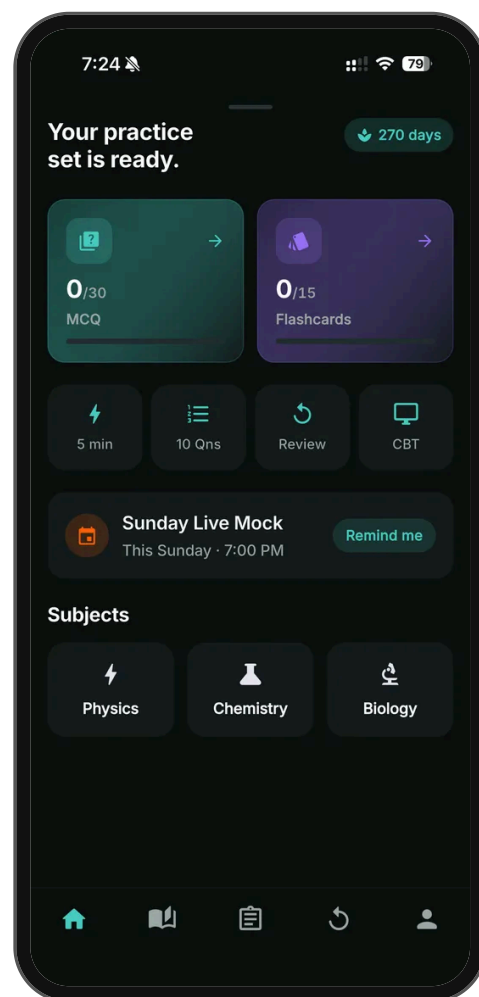
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