

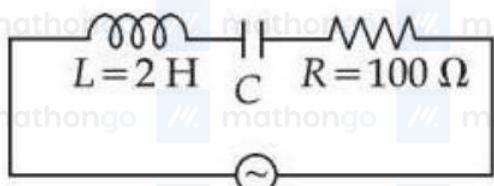
Q1. 21 January Shift 2

A capacitor C is first charged fully with potential difference of V_0 and disconnected from the battery. The charged capacitor is connected across an inductor having inductance L . In t s 25% of the initial energy in the capacitor is transferred to the inductor. The value of t is ____ s.

- (1) $\frac{\pi\sqrt{LC}}{3}$ (2) $\frac{\pi\sqrt{LC}}{6}$ (3) $\frac{\pi\sqrt{LC}}{2}$ (4) $\pi\sqrt{\frac{LC}{2}}$

Q2. 23 January Shift 1

Using a variable frequency a.c. voltage source the maximum current measured in the given LCR circuit is 50 mA for $V = 5 \sin(100t)$. The values of L and R are shown in the figure. The capacitance of the capacitor (C) used is ____ μF .

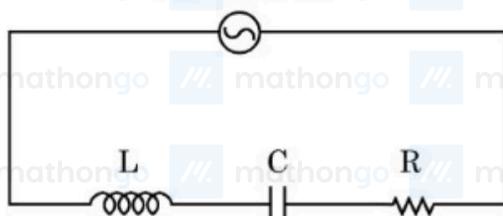


$$V = 5 \sin(100t)$$

Q3. 24 January Shift 1

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

220 V, 50 Hz



$$X_L = 70 \Omega \quad X_C = 150 \Omega \quad 60 \Omega$$

The value of α is ____.

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

Q4. 28 January Shift 1

The electric current in the circuit is given as $i = i_o(t/T)$. The r.m.s current for the period $t = 0$ to $t = T$ is ____.

- (1) i_o (2) $\frac{i_o}{\sqrt{6}}$ (3) $\frac{i_o}{\sqrt{3}}$ (4) $\frac{i_o}{\sqrt{2}}$

Q5. 28 January Shift 2

An inductor stores 16 J of magnetic field energy and dissipates 32 W of thermal energy due to its resistance when an a.c. current of 2 A (rms) and frequency 50 Hz flows through it. The ratio of inductive reactance to its resistance is _____. ($\pi = 3.14$)

