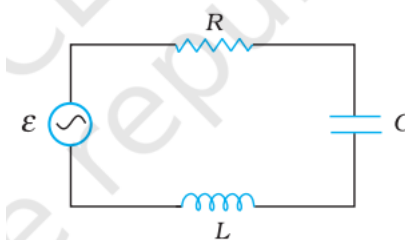


Sainik School Chandrapur (Ministry of Defence)

Class XII Physics Winter Vacations Homework

Solve the following questions

1. A $100\ \Omega$ resistor is connected to a 220 V, 50 Hz ac supply.
(a) What is the rms value of current in the circuit?
(b) What is the net power consumed over a full cycle?
2. (a) The peak voltage of an ac supply is 300 V. What is the rms voltage?
(b) The rms value of current in an ac circuit is 10 A. What is the
3. A 44 mH inductor is connected to 220 V, 50 Hz ac supply. Determine the rms value of the current in the circuit.
4. A $60\ \mu\text{F}$ capacitor is connected to a 110 V, 60 Hz ac supply. Determine the rms value of the current in the circuit.
5. In Q3 and Q4, what is the net power absorbed by each circuit over a complete cycle. Explain your answer.
6. A charged $30\ \mu\text{F}$ capacitor is connected to a 27 mH inductor. What is the angular frequency of free oscillations of the circuit?
7. A series LCR circuit with $R = 20\ \Omega$, $L = 1.5\ \text{H}$ and $C = 35\ \mu\text{F}$ is connected to a variable-frequency 200 V ac supply. When the frequency of the supply equals the natural frequency of the circuit, what is the average power transferred to the circuit in one complete cycle?
8. Figure shows a series LCR circuit connected to a variable frequency 230 V source. $L = 5.0\ \text{H}$, $C = 80\ \mu\text{F}$, $R = 40\ \Omega$.



- a) Determine the source frequency which drives the circuit in resonance.
- b) Obtain the impedance of the circuit and the amplitude of current at the resonating frequency.
- c) Determine the rms potential drops across the three elements of the circuit. Show that the potential drop across the LC combination is zero at the resonating frequency.

Project

Solve Term 1 Question paper.

Note: Use project papers/A4 size paper for the holiday homework.