UNIT IV : EMI AND ALTERNATING CURRENT

1. What are eddy currents? How it can be minimized? Discuss their two applications.
2. Define self induction. Write the SI unit of self inductance.Derive an expression for self inductance of a long, air core solenoid of length l, radius r and having no. of turns N.
3. Give the principle, construction and working of an ac generator. Derive the expression for induced emf.
4. Derive an expression for the impedance of a series LCR circuit.
5. A) What do you mean by resonance in LCR series circuit. Deduce the expression for the resonance frequency in this circuit.
   B) Draw phasor diagram of series LCR circuit.
6. Derive an expression for the motional emf across the movable arm of a loop kept in a uniform magnetic field. The arm is moving with velocity v.
7. Explain principle ,construction and working of a transformer using a labelled diagram. Discuss the loss of energy.
8. A 0.3H inductor , 60μF capacitor and a 50Ω resistor are connected in series with a 120V ,60Hz supply. Calculate i) impedance of the circuit ii) current flowing in the circuit.
9. A) Derive an expression for the average power consumed in a series LCR circuit.
   B) Define the Q-factor of an ac circuit.

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