

SWOT INSTITUTE
EMI & AC (Class-10+2)

1. Explain, why the inductance coils are made of copper.
2. What causes sparking in switches, when light is put off ?
3. An induced current has no direction of its own. Explain, why ?
4. Why is the coil of a dead beat galvanometer wound on a metal frame ?
5. Self-induction is called the inertia of electricity. Explain, why.
6. What is non-inductive wiring of coils ?
7. Why is e.m.f. zero , when maximum number of magnetic lines of force pass through the coil ?
8. A 25 μF capacitor, 0.1 henry inductor and a 25 ohm resistor are connected in series with a source, whose e.m.f. is given by $E = 310 \cos 314 t$ volt.
(a) What is the frequency of the e.m.f. ? (b) What is the reactance of the circuit ? (c) What is the impedance of the circuit ? (d) What is the current in the circuit ? (e) What is the phase angle of the current by which it leads or lags the applied e.m.f. ? (f) What is the expression for the instantaneous value of current in the circuit ? (g) What are the effective voltages across the capacitor, inductor and the resistor ? (h) What value of inductance will make the impedance of the circuit minimum ?
9. Find the power consumed in a circuit having a resistance of 30 ohm in series with an inductance of 40 ohm in series with an a.c. with peak current of 1 ampere and peak voltage of 220 volt.
10. How much current is drawn by the primary coil of a transformer, which steps down 220 V to 22 V to operate a device with an impedance of 220 Ω .
11. Which value of the current do you measure with an a.c. ammeter ?
12. An inductor acts as a conductor for d.c. Why ?
13. The frequency of a.c. is doubled. What happens to X_L ?
14. A capacitor blocks d.c. but allows a.c. to pass through it. Explain, why.
15. Why cannot transformer work on d.c. ?
16. Give two reasons for power loss in a transformer.
17. Why is the core of a transformer laminated ? Explain.
18. Draw the graph showing the variation of reactance of (a) a capacitor and (b) an inductor with the frequency of an a.c. circuit.
19. Explain the importance of power factor.
20. An alternating e.m.f. of 110 V is applied to a circuit containing a resistance of 40 Ω and an inductance L in series. The current is found to lag behind the voltage by an angle $\phi = \tan^{-1} \frac{3}{4}$. Find the (a) inductive reactance ; (b) impedance of the circuit and (c) current flowing in the circuit. If the inductance has a value of 0.1 H, find the frequency of the applied e.m.f.