



PHYSICS CH: 7 ALTERNATING CURRENT

Name: _____

Date: _____

Class: XII Sec: A _____

1. When a lamp is connected to an alternating voltage supply, it lights with same brightness as when connected to a 12V dc battery. What is the peak value of alternating voltage source?
2. 220V ac is more dangerous than 220V dc. Why?
3. The frequency of ac is doubled. How do R , X_L and X_C get affected?
4. A Capacitor blocks dc. Why?
5. For very high frequency ac supply, a capacitor behaves like a pure conductor. Why?
6. What is the maximum value of power factor? When does it occur?
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8. The instantaneous current from an ac source is $I = 6\sin 314t$. What is the rms value of current?
9. Calculate the capacitive reactance of a $5\mu\text{F}$ capacitor for a frequency of 10^6 Hz.
10. A resistor of 12 ohm, a capacitor of reactance 14ohm and a pure inductor of inductance 0.1H are joined in series and placed across 200V, 50Hz ac supply. Calculate (i) current in the circuit, (ii) phase angle between current and voltage.
11. A charged $30\mu\text{F}$ capacitor is connected to a 27mH inductor. What is the frequency of free oscillation of the circuit?
12. A 200Ω electric iron is connected to 220V, 50Hz ac supply. Calculate the average power delivered to iron.
13. A resistor of 12Ω , a capacitor of reactance 14ohm and an inductor of inductance 30ohm are joined in series and placed across a 230V, 50Hz supply. Calculate the (i) current in the circuit (ii) phase angle between current and voltage (iii) power factor.
14. A 120V 60Hz power source is connected across an 800Ω non inductive resistance and an unknown capacitance in series. The voltage drop across the resistor is 102V. (i) What is the voltage drop across the capacitor? What is the reactance of the capacitor?
15. An inductor 200 mH , capacitor $500\mu\text{F}$, resistor 10Ω are connected in series with a 100v variable frequency ac source. Calculate:
 - (i) Frequency at which power factor in the circuit is unity
 - (ii) Current amplitude at this frequency
 - (iii) Q factor.
16. Show that (L/R) has the dimension of time.



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17. Calculate the frequency of series resonance circuit. Define Q factor of this circuit.
18. Explain briefly how the phenomenon of resonance in the circuit can be used in the tuning mechanism of a radio or TV.
19. Why should the quality factor have high value in receiver circuits?
20. How does the term electric resistance differ from impedance? With the help of a suitable phasor diagram obtain a relation for impedance in an ac series LCR circuit.
21. In what situation, is it preferable to use an ac source rather than a dc source? When is dc preferred over dc?
22. What is impedance triangle? Discuss its use.