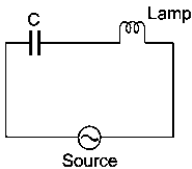
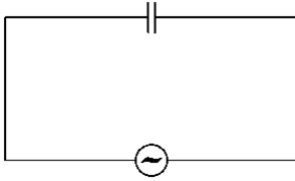


KENDRIYA VIDYALAYA SANGATHAN
ZIET CHANDIGARH
SUB:-PHYSICS CLASS XII 2022-23
PRACTICE PAPER UNIT- VII-ALTERNATING CURRENT

Note: Q. No. 1-4 is of 01 mark each, Q. 5-6 is of 02 marks each, Q.No.7 is of 03 marks, Q. No. 8 is a case study based and is of 04 marks, Q. No. 11 is of 5 marks.

S N	Question	Ma rks
1	In a pure inductive circuit, the current (a) lags behind the applied emf by an angle π (b) lags behind the applied emf by an angle $\pi / 2$ (c) leads the applied emf by an angle $\pi / 2$ (d) and applied emf are in same phase	1
2	Assertion (A): The resistance offered by an inductor in a d.c. circuit is always constant. Reason (R): The resistance of an inductor in steady state is zero. a- Both assertion and reason are correct and the reason is the correct explanation of assertion. b- Both assertion and reason are correct and reason is not a correct explanation of assertion. c- Assertion is correct but the reason is incorrect d- Assertion is incorrect but the reason is correct.	1
3	The potential differences across the resistance, capacitance and inductance are 80 V, 40 V and 100 V respectively in an L-C-R circuit, the power factor for this circuit is (a) 0.4 (b) 0.5 (c) 0.75 (d) 1.0	1
4	Electrical energy is transmitted over large distances at high alternating voltages. Which of the following statements incorrect? (a) For a given power level, there is a lower current. (b) Lower current implies less power loss. (c) Transmission lines can be made thinner. (d) It is easy to reduce the voltage at the receiving end using step-down transformers.	1
5	Define power factor. State the conditions under which it is (i) maximum and (ii) minimum.	2
6	In a series LCR circuit with an ac source of effective voltage 50 V, frequency $\nu = 50/\pi$ Hz, $R = 300 \Omega$, $C = 20 \mu\text{F}$ and $L = 1.0 \text{ H}$. Find the rms current in the circuit.	2
7	An electric lamp connected in series with a capacitor and an ac source is glowing with of certain brightness. How does the brightness of the lamp change on reducing the (i) capacitance and (ii) frequency? 	3
	<p>Case study-based questions (questions no 8- 11) AC VOLTAGE APLIED TO A CAPACITOR The instantaneous voltage, $E = E_0 \sin \omega t$... (i) Then the instantaneous value of current in the circuit at instant 't' is given by $I = \frac{E_0}{1/\omega C} \sin(\omega t + \pi/2)$. The capacitance limits the amplitude of current in a purely capacitive circuit and it is given by $X_c = 1/\omega C$</p> 	4
	8. What is the unit of capacitive reactance?	1
	9. Find the capacitive reactance of a $5\mu\text{F}$ capacitor for a frequency of 10^6 Hz .	1
	10. Draw a graph showing the variation of capacitive reactance X_c with frequency.	2
	OR	
	10. $1\mu\text{F}$ is joined to a 200V, 50Hz alternator. Find the rms current through capacitor.	2

11

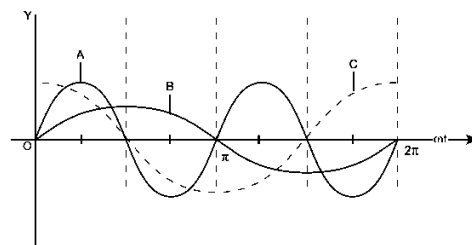
A device 'X' is connected to an ac source $V = V_0 \sin \omega t$. The variation of voltage, current and power in one cycle is shown in the following graph:

(a) Identify the device 'X'.

(b) Which of the curves, A, B and C represent the voltage, current and the power consumed in the circuit? Justify your answer.

(c) How does its impedance vary with frequency of the ac source? Show graphically.

(d) Obtain an expression for the current in the circuit and its phase relation with ac voltage.



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