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WEEKLY TEST CHAPTER 7 TEST

CLASS: XII

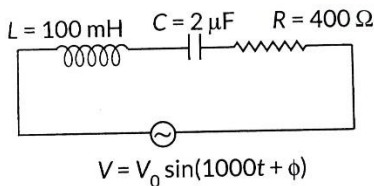
SUBJECT: PHYSICS

FM: 20

TIME: 45 MIN

(1 MARK)

- The rms current in a circuit at 50 Hz is 15 A. what is the current after $1/600$ sec.
(a) $15/\sqrt{2}$ (b) $15\sqrt{2}$
(c) $\sqrt{2}/15$ (d) 8A
- In a series LCR circuit, the capacitance is changed from C to C/4. For the resonant frequency to remain unchanged, the inductance should be changed from L to nL, where n is
(a) $1/2$ (b) 2 (c) 4 (d) $1/4$
- The voltage across a resistor, an inductor, and a capacitor connected in series to an ac source are 20 V, 15 V and 30 V respectively. The resultant voltage in the circuit is
(a) 5V (b) 20 V (c) 25 V (d) 65 V
- The power factor of a series LCR circuit at resonance will be
(a) 1 (b) 0 (c) $1/2$ (d) $1/4$
- Which of the following quantity/quantities remains same in primary and secondary coils of an ideal transformer? Current, Voltage, Power, Magnetic flux
(a) Current only (b) Voltage only
(c) Power only (d) Magnetic flux and Power both
- An ac source of emf $V = V_0 \sin \omega t$ is connected to a capacitor of capacitance C. deduce the expression for current. Draw graph between capacitive reactance and frequency. (2 MARKS)
- Find the value of the phase difference between the current and the voltage in the series LCR circuit shown below. Which one leads in phase: current or voltage? (2 MARKS)



- Derive the transformer equation. Discuss the energy loss in transformer. (3MARKS)
- An ac circuit consists of a series combination of circuit elements X and Y. The current is ahead of the voltage in phase by $\pi/4$. If element X is a pure resistor of 100Ω ,
(a) name the circuit element Y.
(b) calculate the rms value of current, if rms value of voltage is 141 V.
(c) what will happen if the ac source is replaced by a dc source? (3 MARKS)
- (5 MARKS)
 - Deduce the expression for impedance in RLC circuit.
 - Under what condition a circuit get resonance. Deduce the expression for frequency.
 - The power factor of an ac circuit is 0.5. What is the phase difference between voltage and current in the circuit?