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RK Academy

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WEEKLY TEST CHAPTER 7 TEST

CLASS: XII

SUBJECT: PHYSICS

FM: 20

TIME: 45 MIN

(1 MARK)

1. The rms current in a circuit at 50 Hz is 15 A. what will be average current for full cycle of AC
(a) $15/\sqrt{2}$ (b) $15\sqrt{2}$ (c) $\sqrt{2}/15$ (d) zero
2. In a series LCR circuit, the capacitance is changed from C to 2C. For the resonant frequency to remain unchanged, the inductance should be changed from L to nL, where n is
(a) $\frac{1}{2}$ (b) 2 (c) 4 (d) $\frac{1}{4}$
3. 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
4. The power factor is maximum for
(a) resistor (b) capacitor (c) inductor (d) none
5. 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
6. An ac source of emf $V = V_0 \sin \omega t$ is connected to an inductor of inductance L. deduce the expression for current. Draw graph between inductive reactance and frequency. **(2 MARKS)**
7. A step-up transformer has 200 and 3000 turns in its primary and secondary coils respectively. The input voltage given to the primary coil is 90 V. Calculate:
(i) The output voltage across the secondary coil
(ii) The current in the primary coil if the current in the secondary coil is 2 A. **(2 MARKS)**
8. Derive the transformer equation. Discuss the energy loss in transformer. **(3MARKS)**
9. A resistor of 30Ω and a capacitor of $250/\pi \mu\text{F}$ connected in series to a 200 V, 50 Hz ac source. Calculate
(i) the current in the circuit, and
(ii) voltage drops across the resistor and the capacitor,
(iii) Is the algebraic sum of these voltages more than the source voltage? If yes, solve the paradox. **(3 MARKS)**
10. **(5 MARKS)**
 - a. Deduce the expression for impedance in RLC circuit.
 - b. Under what condition a circuit get resonance. Deduce the expression for frequency.
 - c. The power factor of an ac circuit is 1. What is the phase difference between voltage and current in the circuit?