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Eastern University, Sri Lanka

EASTERN UNIVERSITY, SRI LANKA
FIRST EXAMINATION IN SCIENCE - 2005/2006
SECOND SEMESTER (REPEAT)
(MARCH/APRIL 2008)
PH 104 AC THEORY

Time: 01 hour.

Answer ALL Questions

1. Sketch graphs showing the relationships between current, impedance and frequency in an LCR series circuit. Explain what is meant by resonance in such a circuit and calculate the frequency at which it occurs in terms of L and C .

A series circuit with $R = 5\Omega$, $C = 20\mu F$ and a variable inductance L has an applied voltage $V = 10$ Volts with a frequency of 1000rad sec^{-1} . L is adjusted until the voltage across the resistor is a minimum. Find:

- i. Inductance of the inductor
 - ii. The current through the circuit
 - iii. The voltage across the capacitor
 - iv. The voltage across the resistor.
2. An inductor with inductance L is connected across an AC supply of frequency f . Derive an expression for its inductive reactance. If a resistance R is connected in series to the inductor, draw impedance-phasor diagram for the circuit and find,
 - i. Circuit impedance of the circuit
 - ii. Phase angle of the circuit.