EASTERN UNIVERSITY, SRI LANKA
FIRST EXAMINATION IN SCIENCE 2002/2003 (EXTERNAL DEGREE)
(SECOND SEMESTER)

EXTPH 104 AC THEORY

Time : 1 Hour

Answer **All** Questions

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1. (a). Write down expressions for capacitive and inductive reactance

   (i) 0.3 H inductor has a resistance 6000 Ω when connected to an AC power supply. What is the frequency of the supply?

   (ii) A capacitor with capacitance 0.1 μF is connected to 100 V, 50 Hz supply. Calculate the reactance of the capacitor and the current flowing through the capacitor.

   (b). 50 Ω resistor is connected in series with a 1 μF capacitor and this combination is connected to a 200 V, 1000 Hz supply. Calculate

   (i) the circuit impedance

   (ii) the circuit current

   (iii) the phase angle

   (iv) the voltages across the capacitor and the resistor.

2. A resistor with resistance R, a capacitor with capacitance C and an inductor with inductance L are connected in series to a power supply of voltage V and frequency f. Determine

   (i) the circuit impedance (ii) the phase angle

   When the circuit is at resonance determine the above values and the resonant frequency. Determine the voltages across C and L at resonance.

   If R = 100 Ω , C = 0.1 μF , L = 0.01 H and V = 100 V calculate

   (i) Resonant frequency

   (ii) Circuit current at resonance

   (iii) Q – factor of the circuit.