EASTERN UNIVERSITY, SRI LANKA

FIRST EXAMINATION IN SCIENCE - 2002/2003

SECOND SEMESTER

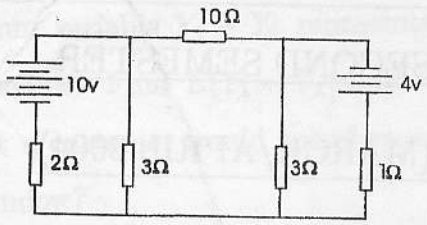
(MARCH/APRIL 2004)

PH 104 AC THEORY

Time: 01 hour.

Answer ALL Questions

1. State Thevenin's and Norton's theorems and illustrate one of them with an example.



Find the current in the 10Ω resistor of the above circuit using

(i) Thevenin's theorem

(ii) Norton's theorem

2. (a) Sketch a graph showing the relationships between current, impedance and frequency in a LCR series circuit.

(b) Explain what is meant by resonance in such a circuit and calculate the frequency at which it occurs in terms of L and C.

(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 $1000 radsec^{-1}$. 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