

B.Tech II Year I Semester (R13) Supplementary Examinations June 2016

ELECTRICAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Write mathematical expression to find voltage in an inductor, define all terms.
 - What is the charge when the capacitance is 0.001 micro Farads and voltage is 2000 volts?
 - Define phase angle
 - In a circuit, $v = 200 \sin(\omega t + 30^\circ) V$, $i = 15 \sin(\omega t - 30^\circ) A$. Find the reactive power.
 - Define resonance frequency.
 - Define tree.
 - State Thevenin's theorem.
 - Discuss condition for maximum power transfer in dc circuit.
 - What is Fourier transform?
 - What is Laplace transform?

PART – B

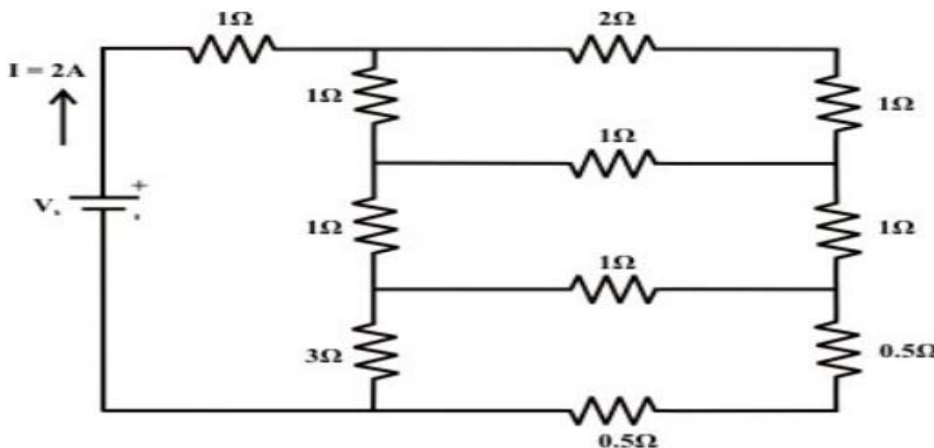
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Find the expression for the mutual inductance in the series connection of two coupled coils, when the flux of two coils assists each other, the net equivalent inductance being L_1 and when the flux of the two coils opposes each other, the equivalent inductance being L_2 .

OR

- 3 Find the value of the voltage source (V_s) that delivers 2 amps current through the circuit as shown in figure below.

**UNIT – II**

- 4 Explain how to measure three phase power using two watt meter method, also explain method to find power factor.

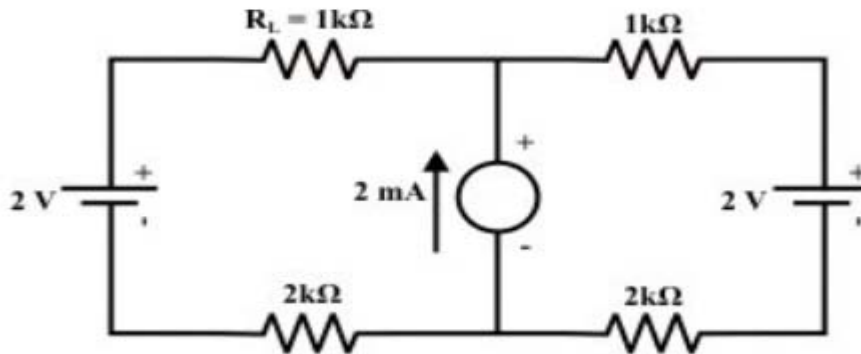
OR

- 5 Explain r.m.s, average values, form factor for sinusoidal alternating quantities. Discuss susceptance and admittance.

Contd. in page 2

UNIT - III

- 6 Find the current flowing through the $1\text{ k}\Omega$ (R_L) resistor for the circuit shown below, using mesh analysis. What is the power delivered or absorbed by the independent current source?



OR

- 7 A coil, having a resistance of $15\ \Omega$ and an inductance of 0.75 H , is connected in series with a capacitor (Figure A). The circuit draws maximum current, when a voltage of 200 V at 50 Hz is applied. A second capacitor is then connected in parallel to the circuit (Figure B). What should be its value, such that the combination acts like a non inductive resistance, with the same voltage (200 V) at 100 Hz ? Calculate also the current drawn by the two circuits.

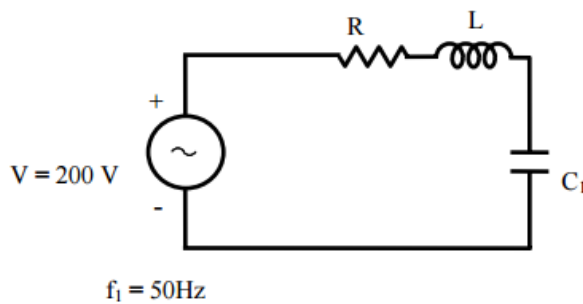


Fig. Q7 (a) Circuit diagram

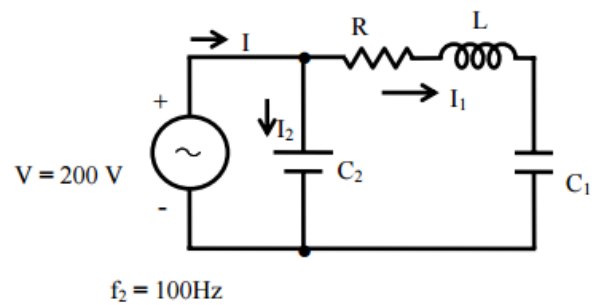


Fig. Q7 (b) Circuit diagram

UNIT - IV

- 8 Explain Tellegen theorem and Millman theorem.
OR
9 Explain Z-parameters and h parameters of two port network.

UNIT - V

- 10 Explain transient response of a DC RL circuit.

OR

- 11 Explain step response of a RC circuit.
