

Code: 13A04101

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

NETWORK ANALYSIS
(Common to ECE and EIE)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

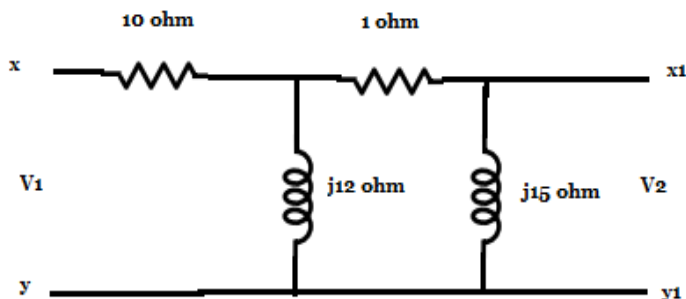
- 1 Answer the following: (10 X 02 = 20 Marks)
 - (a) State maximum power transfer theorem.
 - (b) What is Tie- set?
 - (c) Write expression to find current in RL circuit.
 - (d) An impedance of $(3+j4)$ ohm is connected with a resistance of 10 ohm. Find the ratio of power loss in these parallel circuits.
 - (e) Write expression for resonant frequency for a series RLC circuit.
 - (f) A coupled circuit with inductances 20mH, 50mH and coefficient of coupling 0.8, find the mutual inductance for the circuit.
 - (g) Write transmission parameters for two port network.
 - (h) Write standard form of state space model.
 - (i) In a simple T section, a low pass filter has design impedance R_0 . Find $Z_{0\pi}$ at $0.9f_c$.
 - (j) Define ideal filter.

PART – B

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

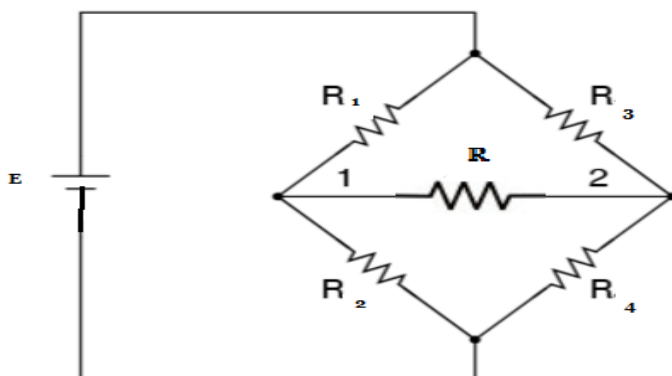
UNIT - I

- 2 Find the transfer function (V_2/V_1) for the network given using mesh analysis.



OR

- 3 Find Thevenin equivalent circuit at points 1,2



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UNIT - II

- 4 Explain sinusoidal response of series RC circuit with circuit diagram, phasor diagram and waveforms along with mathematical expressions

OR

- 5 Two parallel impedance branches take currents $3.15 \angle 68^\circ \text{A}$ and $12 \angle -45^\circ \text{A}$. Find the complex power drawn from supply if the supply voltage is $17 \angle 0^\circ \text{V}$.

UNIT - III

- 6 A RLC tank circuit is composed of components having values as $R = 0.2 \text{ ohm}$, $L = 100 \text{mH}$, $C = 50 \text{ micro Farads}$. Determine the resonance frequency and the corresponding input current at 24 V .

OR

- 7 In an ideal transformer, $K = 0.8$, the mutual inductance = 10H , number of primary and secondary turns are 50 and 200. Obtain the value of primary current to produce 0.5 Wb flux to link the secondary coil.

UNIT - IV

- 8 Represent the following equation in state variable form:
 $(dy^2/dt^2) + (5dy/dt) + 6y = u(t)$

OR

- 9 Explain Z-parameters and h parameters of two port network.

UNIT - V

- 10 Explain constant K filter, Constant K –low pass filter and Constant K-high pass filter.

OR

- 11 A T-section low pass filter has series inductance 80mH and shunt capacitance $0.022 \text{ micro Farads}$. Determine the cut-off frequency and nominal design impedance (R_0). Also design an equivalent π – section.
