PVP 14

Code: EC3T4

II B.Tech - I Semester – Regular/Supplementary Examinations
November - 2019

NETWORK ANALYSIS AND SYNTHESIS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

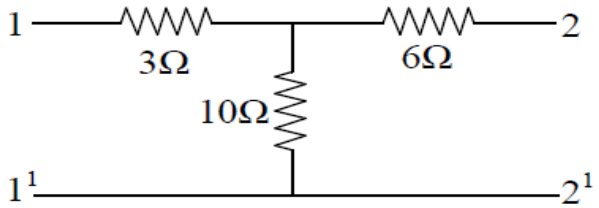
PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1. a) State Thevenin's theorem.

b) Write the Z-parameters of the following network.



c) Give the condition for reciprocity and symmetry in case of h-parameters.

d) Give the advantages and disadvantages of tie-set matrix.

e) Define natural and forced response of a transient circuit.

f) Define Graph, Tree, Basic Cut set.

g) Define Driving Point Impedance function.

h) What are the Laplace transform of step and exponential functions.

i) Define poles and zeros in a transfer function.

j) Write the properties of LC Networks.

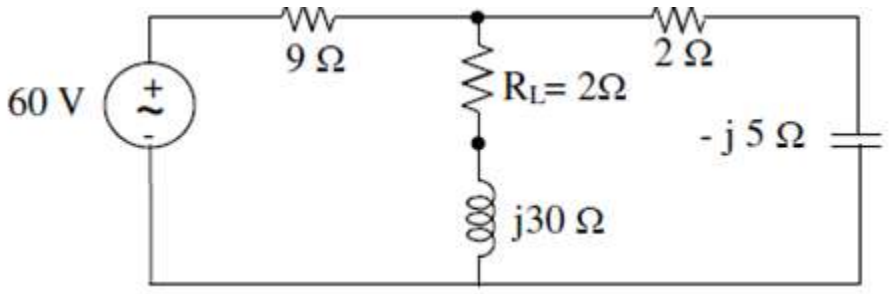
k) Write any two properties of positive real function.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Find current through R_L using Thevenin's theorem for the circuit as shown in figure. 8 M



figure

b) State and explain Substitution theorem. 8 M

3. a) Derive the expression for transient response in series R-L-C circuit for AC excitation using Laplace transform method. 10 M

b) For the graph shown in Fig, write the incidence matrix. Express branch voltage in terms of node voltages and then write a loop matrix. 6 M

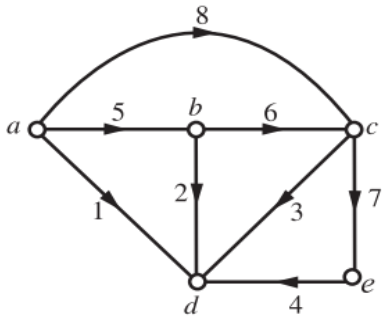
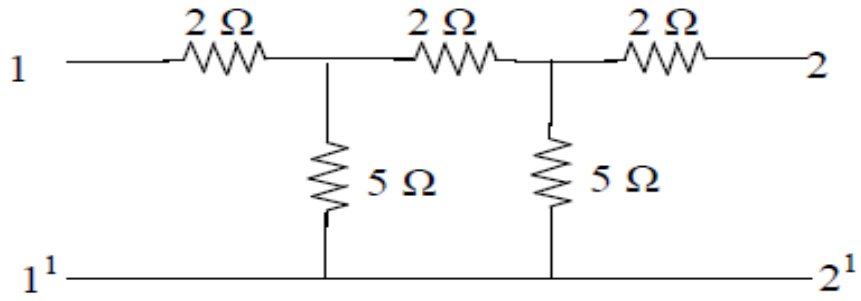


Fig.

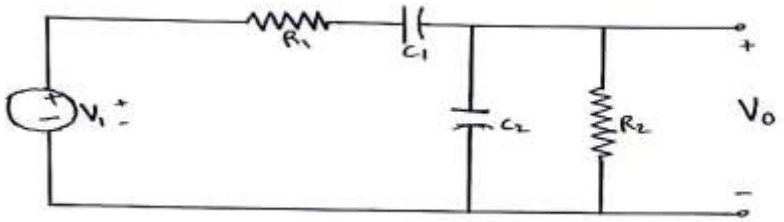
4. a) Derive the symmetry and reciprocity conditions for ABCD Parameters. 8 M

b) Determine Z parameters for the network as shown in the figure. 8 M



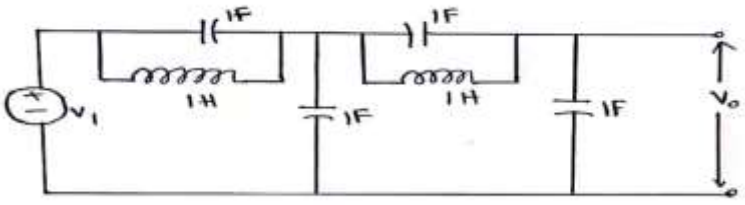
figure

5. a) For the ladder network shown in figure below, find the expression for transfer function. 8 M



figure

b) Express $\frac{V_0}{Vi}$ for the LC ladder network shown in the figure in the form $\frac{K(s^2+a)(s^2+b)}{(s^2+c)(s^2+d)}$ 8 M



figure

6. a) Test whether the polynomial P(s) = $(s^5 + 3s^3 + 2s)$ is Hurwitz.

8 M

b) Find the Foster-II realization of $Z(s) = \frac{4(s^2+1)(s^2+16)}{s(s^2+4)}$

8 M