PVP 14

Code: EC3T4

II B.Tech - I Semester–Regular/Supplementary Examinations
November 2016

NETWORK ANALYSIS AND SYNTHESIS
(ELECTRONICS AND 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 and explain Kirchhoff's laws.
b) State the superposition theorem and write its importance.
c) Explain the steps to apply Thevenin's Theorem.
d) Define the terms network, graph, loop matrix.
e) Write the properties of a tree in graph.
f) Compare analysis and synthesis with respect to network.
g) Write the relation between H-parameters and Y-paramters.
h) Explain the parallel connection of two two-port networks.
i) Briefly explain the concept of poles and zeros in a network.
j) Write the steps to obtain the stability of a network function.
k) Apply Routh Hurwitz criteria for the polynomial $P(s)=s^3+2s^2+4s+M$. "M" is adjustable.

PART – B

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

3 x 16 = 48 M

2.

a) State and explain Tellegen's theorem. 8 M

b) Using compensation theorem, determine the ammeter reading when it is connected to 6Ω resistor as shown in fig. 1. The internal resistance of the ammeter is 2Ω . 8 M

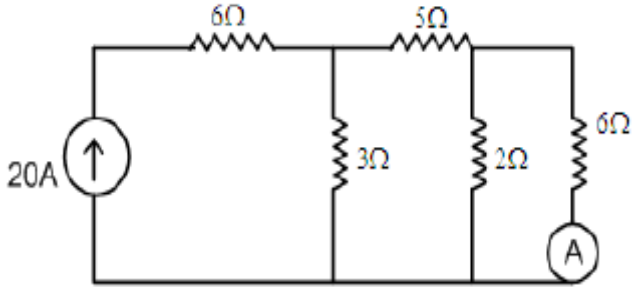

Fig. 1.

3.

a) For the resistive circuit in fig. 2, Determine the number of branches, number of nodes and number of links. Write down the incident matrix and also develop equilibrium equation. 8 M

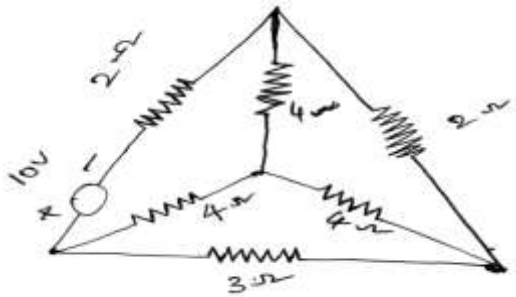

Fig. 2.

b) Derive the DC response of a series Resistor–Capacitor circuit. 8 M

4.

a) Find the y-parameters of the network shown in fig. 3 .

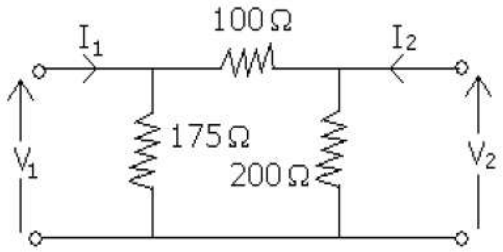

Fig. 3. 8 M

b) Calculate the Z-parameters for the lattice network shown in fig. 4. 8 M

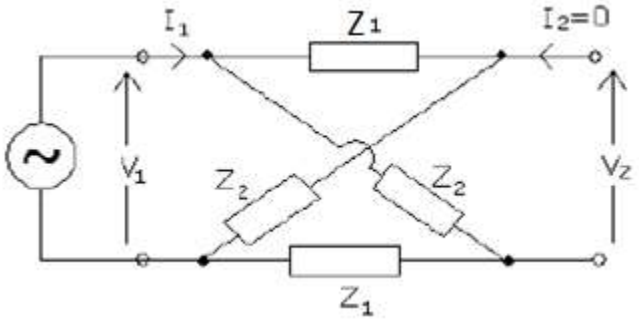

Fig. 4.

5.

a) Discuss the restrictions of location of poles and zeros in driving point functions. 8 M

b) Determine the voltage transfer function v_2/v_1 for the fig. 5. 8 M

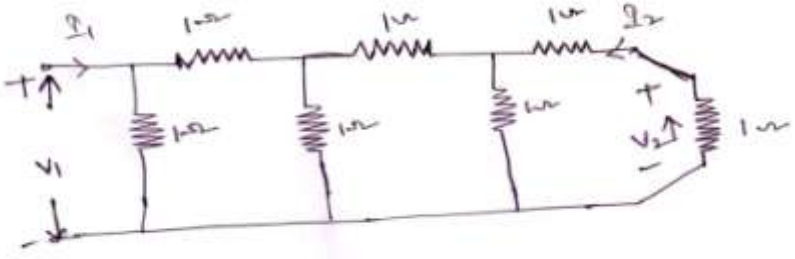

Fig.5.

6.

a) Show the pole zero plot of the given network function $V(s)=10s / (s+3)(s+2)$ and obtain v(t). 8 M

b) What are the conditions specified by the Hurwitz polynomial? List the properties of Hurwitz polynomial. 8 M