PVP 14

Code: EC3T4

II B.Tech - I Semester–Regular/Supplementary Examinations
November 2017

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 the maximum power transfer theorem.
b) State Compensation Theorem.
c) Referring to Figure-1, determine the thevenin equivalent of the network connected to R_L

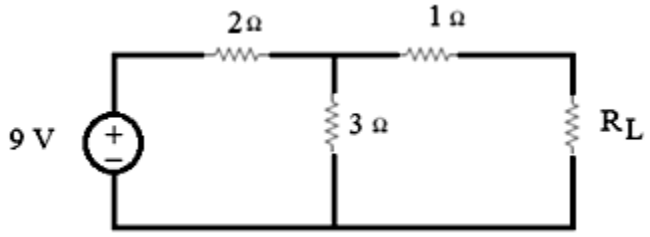

Figure-1

d) Define Tie –set and Cut-set.
e) In a source free RL circuit shown in Figure-2, the inductor has a current i_L = 2A at t=0, find an expression for $i_L(t)$ valid for t > 0, and its value at t=200μs

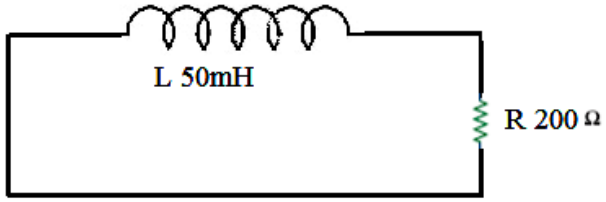

Figure-2

f) Find the Y_{11} of a two port network, if the Z-Parameters of the same two port network are given by $Z_{11}= 20\Omega$, $Z_{12} = 10\ \Omega$, $Z_{21} = 15\ \Omega$, $Z_{22} = 5\ \Omega$.

g) Obtain the Z parameters for the network shown in Figure-3.

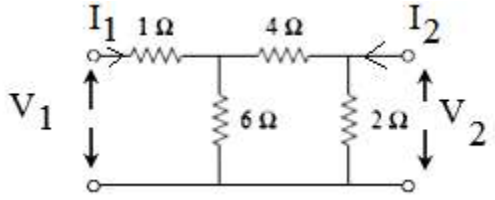

Figure-3

h) Write the steps for realization of LC network functions.

i) How do poles and zeros can be identified in circuit transfer function?

j) Write the necessary and sufficient conditions for RC networks.

k) Plot the pole – zero for the transfer function
$Y(S) = (2S^2+ S+1) / (S^2+ S+1)$

PART – B

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

3 x 16 = 48 M

2. a) For the circuit in Figure-4, use superposition theorem to determine the unknown branch current i_x. 8 M

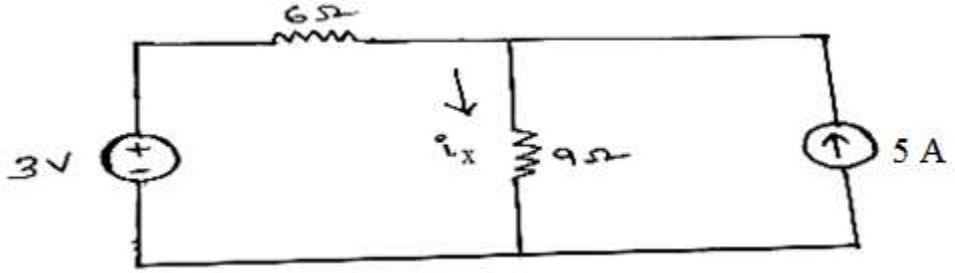

Figure-4

b) Solve for the current in the 5 ohm resistor for the circuit shown in the Figure-5. 8 M

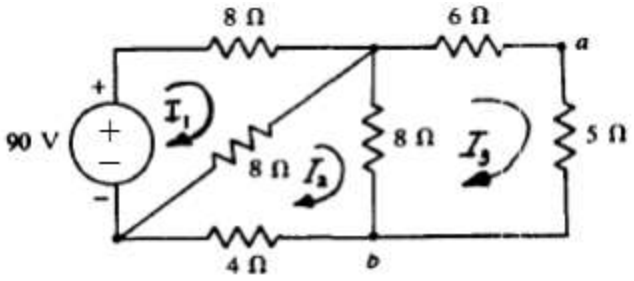

Figure-5

3. a) For the circuit in figure-6 obtain the dual circuit. 8 M

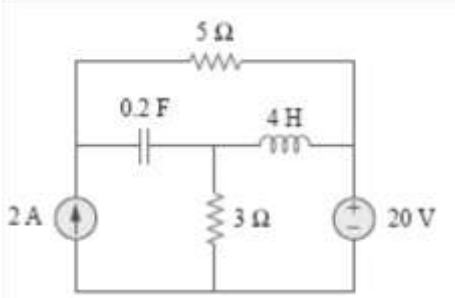

Figure-6

b) In the circuit shown in Figure-7. Find i_o, v_o and i for all time, assuming that the switch was open for a long time. 8 M

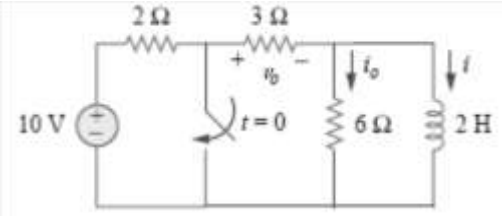

Figure-7

4. a) Obtain the h-Parameters for the network shown Figure-8. 8 M

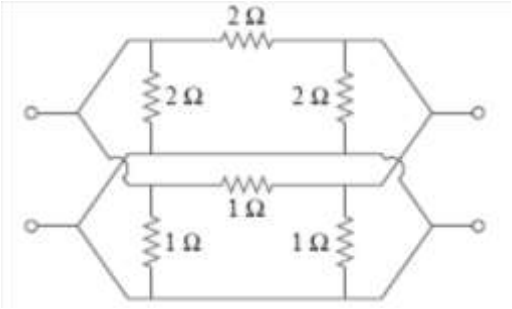

Figure-8

b) Obtain the Y parameters for the T network as shown in Figure-9. 8 M

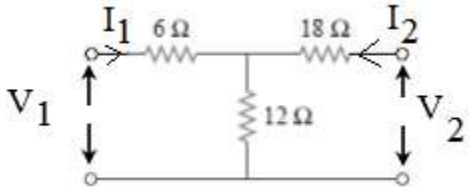

Figure-9

5. a) Determine the transfer function H (s) = Vo (s) / I_0 (s) of the circuit shown in the Figure-10. 8 M

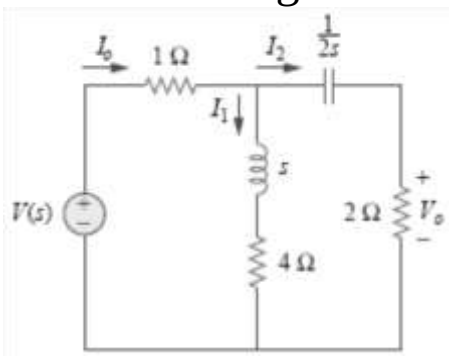

Figure-10

b) Determine the poles and zeros of the impedance function Z (s) in the network shown in Figure-11. 8 M

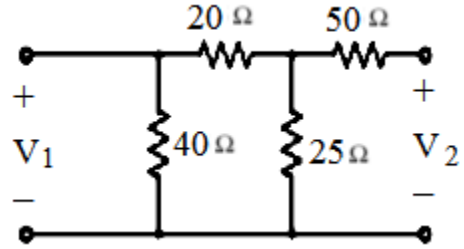

Figure-11

6. a) What are the conditions specified for the realization of RL functions? 8 M

b) Synthesize the impedance function , Z (s) = (S^3+ 3S) /(S^2+ 3). 8 M