Code No: 133BJ

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, May/June - 2019

NETWORK ANALYSIS

(Common to ECE, ETM)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Define cutset matrix. [2]

b) Two coupled coils of L_1=08H and L_2=0.2 H have a coupling coefficient K=0.9. Find the mutual inductance? [3]

c) Write the relation between Q factor and Bandwidth of parallel resonance circuit. [2]

d) Write the condition for over damping of series RLC circuit. [3]

e) Find Laplace transform of ramp function? [2]

f) Find the one sided Laplace Transform of Ku(t) where K is an unknown real constant. [3]

g) Define all four admittance parameters of two port network. [2]

h) Define a driving point impedance and driving point admittance of two port network. [3]

i) Draw the circuit diagram of π attenuator. [2]

j) State Foster's reactance theorem. [3]

PART - B

(50 Marks)

2. Draw the directed graph, tree, cutset matrix and tie set matrix for the network shown in figure 1. [10]

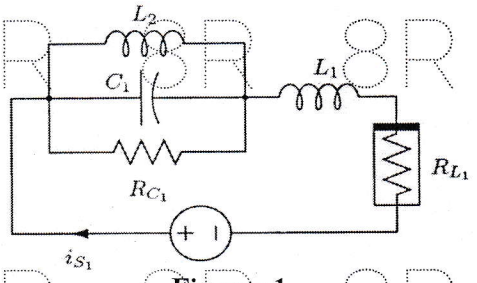

Figure: 1

OR

3. Find the coupling coefficient and energy stored in the inductors for the following circuit shown in figure 2. [10]

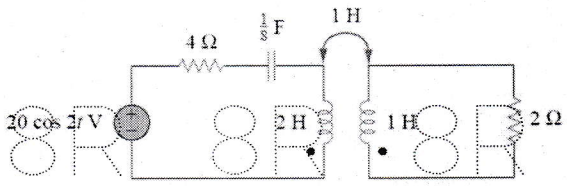

Figure: 2

4. The switch shown in figure 3 is at position 1 for t<0. At t=0 it moves to position 2. Sketch v(t) as a function of time. [10]

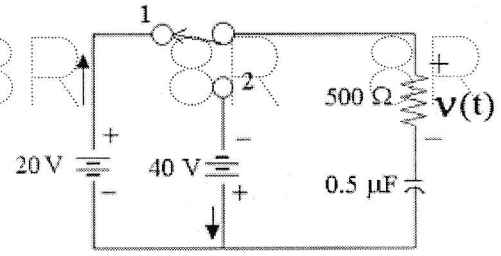

Figure: 3

OR

5. A series RLC circuit with R=50Ω, L=0.1H and C=50μF has a constant voltage V=100V applied at t=0. Find the current transient assuming zero initial charge on the capacitor. [10]

6. Find v for the circuit using Laplace Transform shown in figure 4. [10]

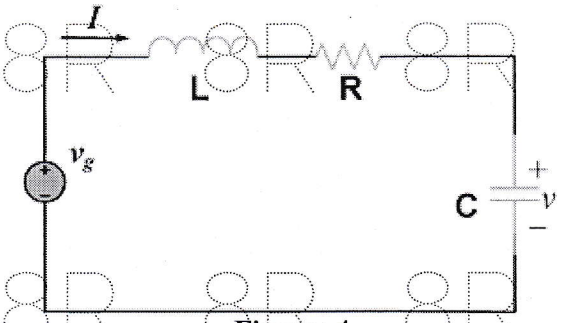

Figure: 4

OR

7. Consider the signal h(t) = t^1u(t). Use the Laplace Transform multiplication theorem to find the response of this system to a unit step input u(t) in Laplace Transform. [10]

8. Derive the relation between Z-parameters and Y-parameters and also ABCD parameters. [10]

OR

9. Define h-parameters for two port network and find them for the following circuit shown in figure 5. [10]

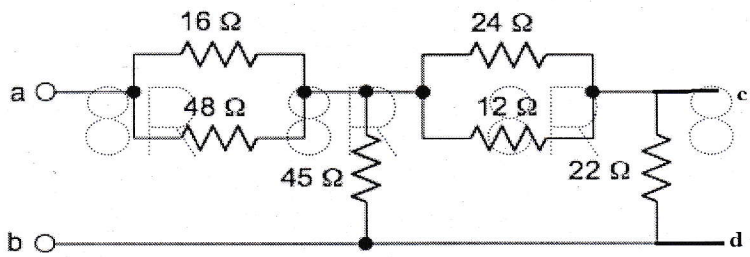

Figure: 5

10.a) Explain how to convert T network to π network?

b) A π-pad attenuator is required to reduce the level of an audio signal by 12dB while matching the impedance of the 500Ω network. Calculate the values of the three resistors required. [5+5]

OR

11.a) Draw the low pass T filter and draw its frequency response.

b) Design a constant k high pass π filter with cut off frequency of 2 kHz. [5+5]

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