Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

Roll No .....

EC-222 (CBCS)

B.E. III Semester

Examination, December 2017

Choice Based Credit System (CBCS)

Network Analysis

Time : Three Hours

Maximum Marks : 60

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Calculate the voltage (V) in the circuit of Figure 1.

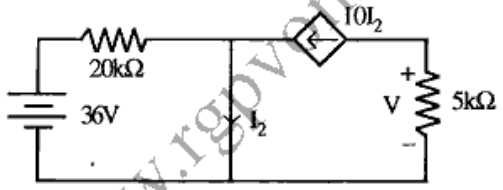

Figure 1

b) Determine I in the circuit shown in Figure 2.

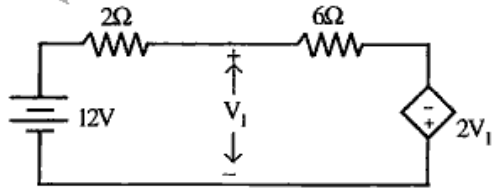

Figure 2

c) Write the KCL equations for the circuit shown in Figure 3.

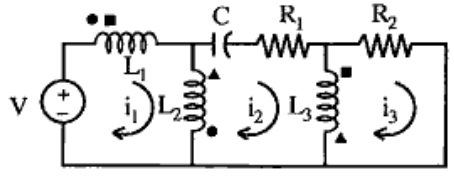

Figure 3

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2. a) For the network shown in Figure 4, draw network graph. Obtain the basic cutsets and write basic cutset matrix.

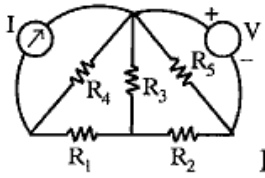

Figure 4

b) For the network shown in Figure 5. Obtain the incidence matrix, the node admittance matrix and the matrix node equation.

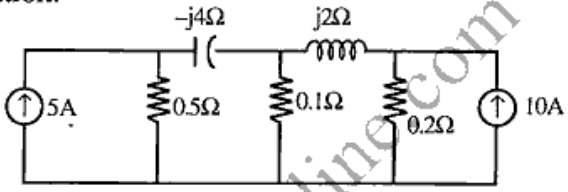

Figure 5

3. a) Find the Norton equivalent of the network shown in Figure 6.

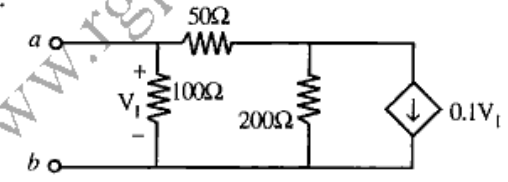

Figure 6

b) Determine the value of R_L to be connected across AB in Figure 7, for maximum power transfer. Also calculate the maximum power absorbed by R_L.

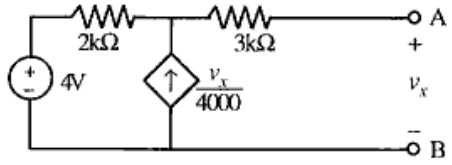

Figure 7

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4. a) State and prove reciprocity, and compensation theorems.
   b) State and prove Tellegen's theorem.

5. a) Find the current $i(t)$ for the network shown in Figure 8 if the voltage source $v(t) = 2e^{-0.5t}\,u(t)$ and $v_c(0^+) = 0$

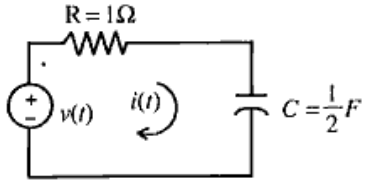

Figure 8

   b) At t = 0, s is closed in the circuit of figure 9, find $v_c(t)$ and $i_c(t)$. All initial conditions are zero

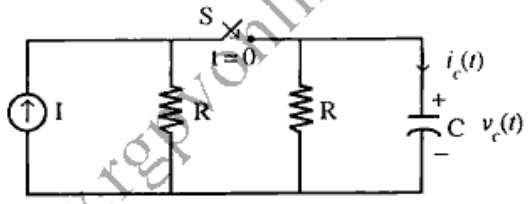

Figure 9

6. Calculate the current in 6Ω resistor of the circuit of Figure 10 by
   i) Thevenin's theorem
   ii) Superposition theorem

   Use Laplace transform method:

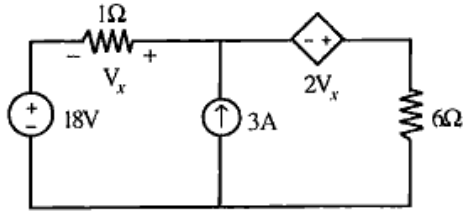

Figure 10

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7. a) Determine the Z-parameters for the network shown in figure 11.

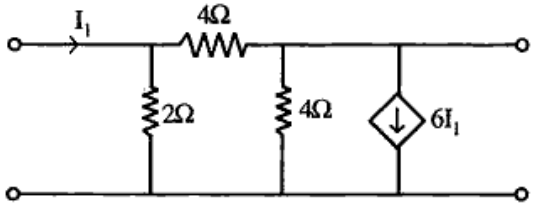

Figure 11

   b) Obtain the Z-parameters of the network shown in figure 12.

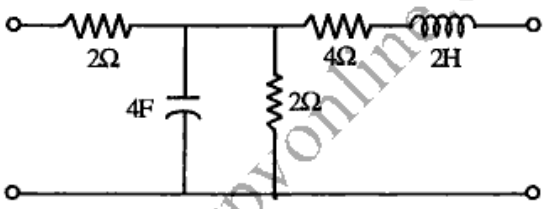

Figure 12

8. Write short notes on any two of the following:
   a) Parallel resonance
   b) Maximum power transfer theorem
   c) Hybrid parameters

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