TEE-301 (ECE) 1281

Odd Semester Examination, 2017-18

B.TECH. (SEMESTER-III)

NETWORK ANALYSIS AND SYNTHESIS

Time: 03:00 Hours   **Max Marks : 100**

[5X4]

1.   Attempt **any four** of the following :

   (a)   What is the fundamental loop matrix and how it is formed?

   (b)   Define the term: Tree, Co Tree, Tie set &cut set.

   (c)   Write the matrix node equation using the nodal analysis & the matrix loop equation using the loop analysis in graph theory.

   (d)   List the essential properties of a linear network system.

   (e)   For the graph shown in figure, consider the tree formed by branches (2, 3, 4), using this tree write A, B,
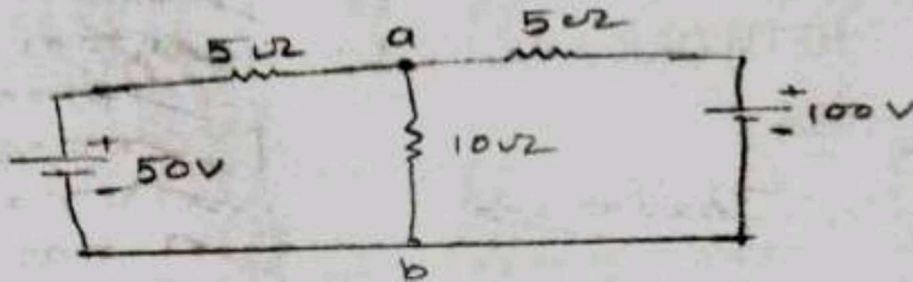

[5X4]
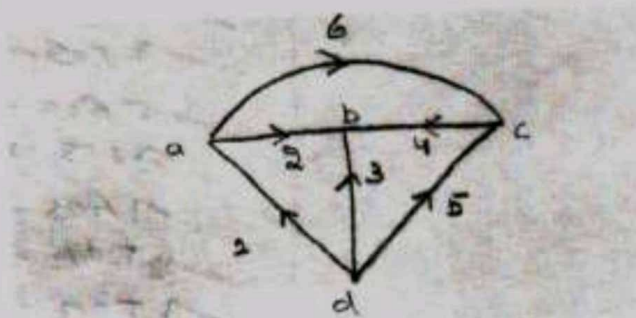
2.   Attempt **any four** of the following :

   (a)   State and explain Thevinin's Theorem.

   (b)   Verify the reciprocity theorem for the circuit shown in the figure.
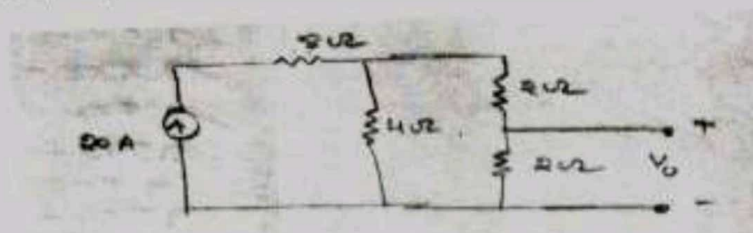
(c)   What is maximum power transfer theorem and prove that the overall efficiency of circuit supplying maximum power is 50%.
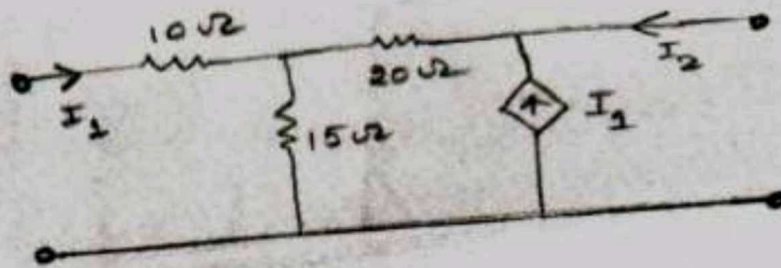
(d)   Find the Norton equivalent across the point a-b

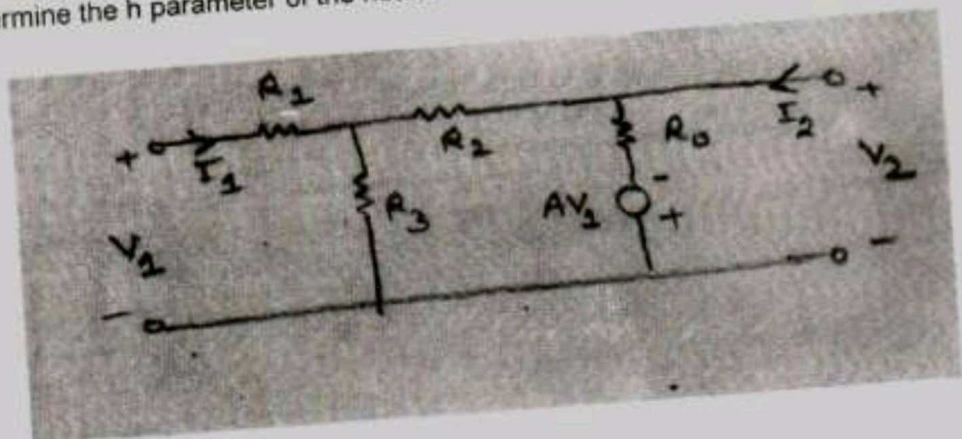(e)   State and prove Millman's Theorem for ac voltage source.
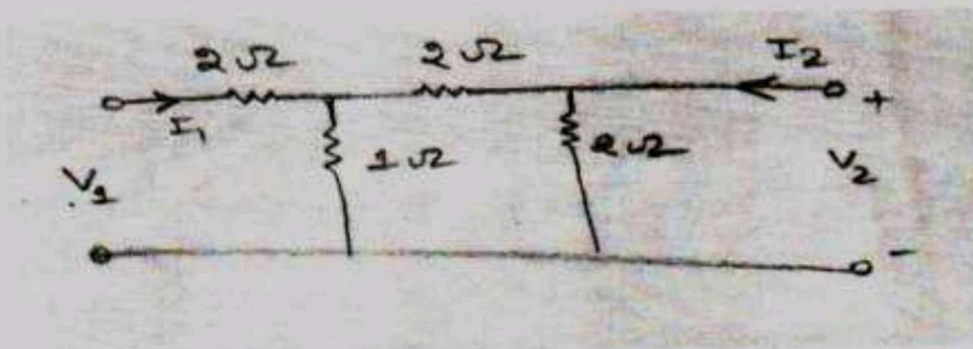
[10X2]

3.   Attempt **any two** of the following:

(a)   Obtain Z parameter of the network shown in fig whether the network shown is symmetrical or reciprocal or not.

(b)   Determine the h parameter of the network shown in fig.

(2)

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(c)   For the network shown in fig Calculate

(i)   Z parameters

(ii)   Y parameters

(iii)   ABCD parameters

(iv)   h parameters

4.   Attempt **any two** of the following :   [10x2]

(a)   Find the laplace transform of the function:

    (i)   Impulse function

    (ii)   Unit step function

    (iii)   Ramp function

    (iv)   Parabolic function

(b)   Find the inverse laplace transform of the given function and draw the pole zero diagram

$$H(s) = \frac{s(s+1)}{(s+4)(s^2 + 6s + 5)}$$

(c)   Determine inverse laplace transform of the following function using convolution integral.

$$F(s) = F_1(s).F_2(s) = \frac{s+1}{s(s^2 + 4)}$$

5. Attempt **any two** of the following : [10x2]

(a) For the network function given below: Synthesize in foster form one and cauer form one.

$$Y(s) = \frac{2(s+1)(s+3)}{(s+2)(s+4)}$$

(b) An impulse is applied to the input of a system and the output is observed to be the time function e^{-2t}. Find the transform function of the system and check the stability of the system by pole zero plot.

(c) Realize the following RC driving point impedance function in foster I form and cauer II form:

$$Z(s) = \frac{s^2 + 4s + 3}{s^2 + 4s}$$

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