PAPER ID-411860

Subject Code: REE305

Roll No: | | | | | | | | | | | | | |

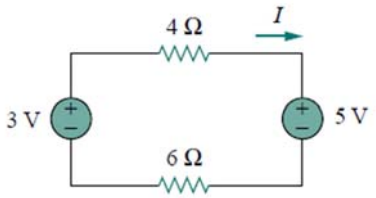
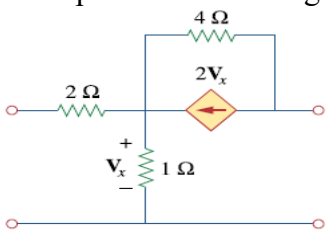
BTECH
(SEM III) THEORY EXAMINATION 2021-22
NETWORK ANALYSIS AND SYNTHESIS

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

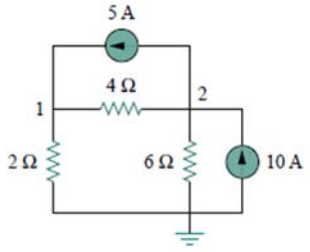
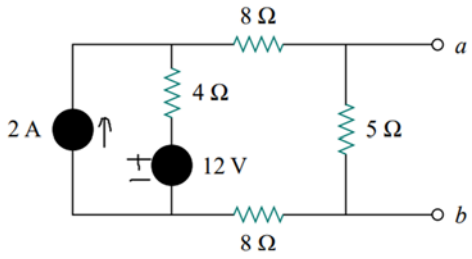
SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

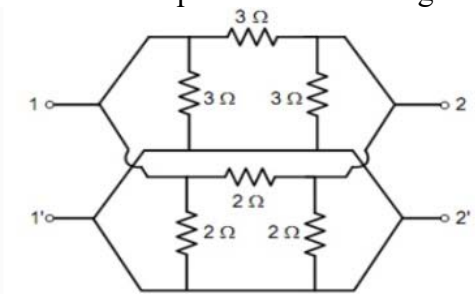
a.	Find the current *I* in the circuit shown in the Figure 1.  Figure 1
b.	Find out h_{11} and h_{21} in terms of Y parameters.
c.	Find Z-parameter for the given network in Figure 2:  Figure 2
d.	What is maximum power transfer theorem?
e.	Write two properties of Complete Incidence matrix.
f.	Perform test on given polynomial to check whether it is Hurwitz or Not. $F(s) = s^7+3s^6+s^5+4s^4+4s^3+2s^2+10s+10$
g.	Write the properties of R-C driving point functions.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

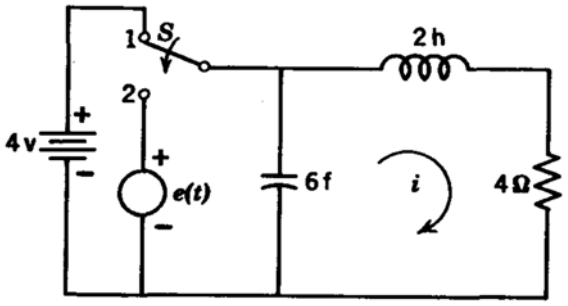
a.	Identify the node voltages in the circuit shown in Figure 3.  Figure 3
b.	Find the Norton equivalent circuit of the circuit in Figure 4. 

BTECH
(SEM III) THEORY EXAMINATION 2021-22
NETWORK ANALYSIS AND SYNTHESIS

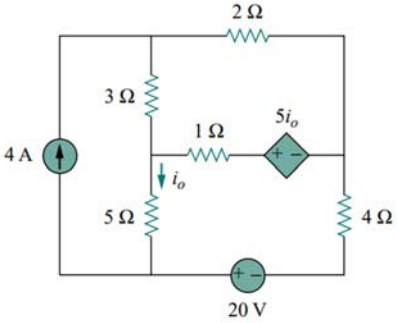
	Figure 4
c.	Check the stability of the polynomial by applying Routh-Hurwitz criterion in: $F(s) = s^6+3s^5+8s^4+15s^3+17s^2+12s+4$
d.	Find out the z parameters for the given two port networks in figure 5:  Figure 5
e.	Find the first Foster form and second Cauer form after synthesizing the impedance function given by, $Z(s) = 2\,(s+1)\,(s+3)/(s+2)\,(s+6)$

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

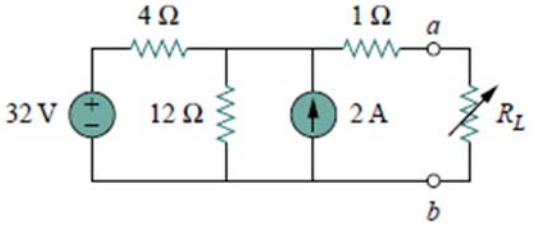
(a)	Explain the term resonance. Also determine the condition of resonance in serial RLC circuit.
(b)	As shown in the Figure 6 the switch S is moved from position 1 to 2 at t = 0, having been in position 1 for a long time before t = 0. Find particular solution for i(t) for t > 0, given that $e(t) = e^{-t} \sin 2t$.  Figure 6

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Find i_o in the circuit shown in the figure using superposition.  Figure 7

Roll No: | | | | | | | | | | | | | |

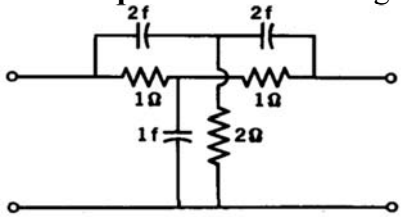
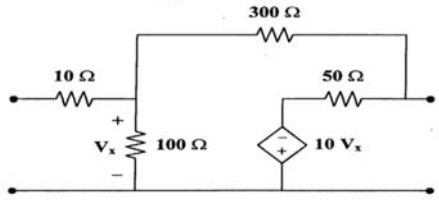
BTECH
(SEM III) THEORY EXAMINATION 2021-22
NETWORK ANALYSIS AND SYNTHESIS

(b)	Find the Thevenin equivalent circuit of the circuit shown in Figure 8, to the left of the terminals *a-b*.  Figure 8

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain following terms with reference to network topology: (i) Tree (ii) Co-tree (iii) Incidence matrix (iv) Oriented graph (v) Twig and link
(b)	Explain Complete Incidence Matrix, Tie Set Matrix and Cut set matrix for a graph with the help of proper example.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Find **Y parameters** for the given network in figure 9:  Figure 9
(b)	Obtain h and g parameters for the network shown below in figure 10:  Figure 10

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Identify the Given impedance function and then Find out first and second Cauer form for the same impedance function given below: $(s^2+4)/2(s^2+1)(s^2+9)$
(b)	Find the Foster I form, Foster II form, Cauer I form & Cauer II form for the given function: $F(s) = 2(s^2+1)(s^2+9) / s(s^2+4)$