PAPER ID-411291

Subject Code: BEE403

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

BTECH

(SEM IV) THEORY EXAMINATION 2023-24

NETWORKS ANALYSIS & SYNTHESIS

TIME: 3 HRS **M.MARKS: 70**

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

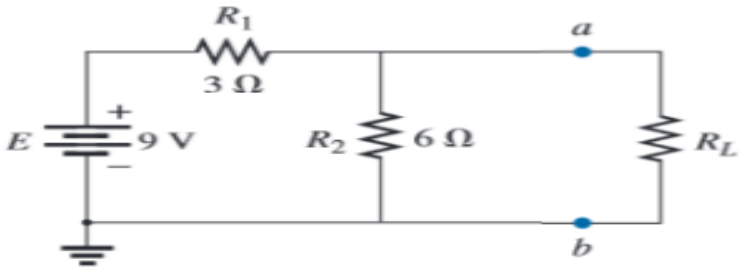
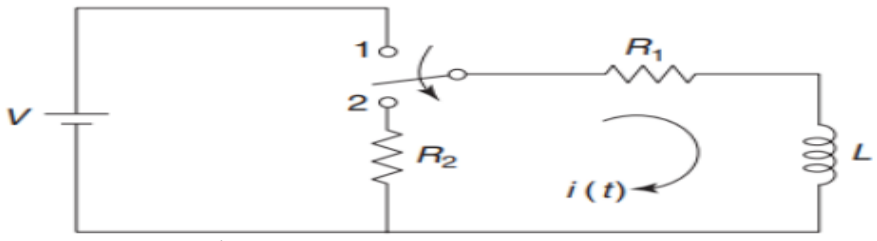
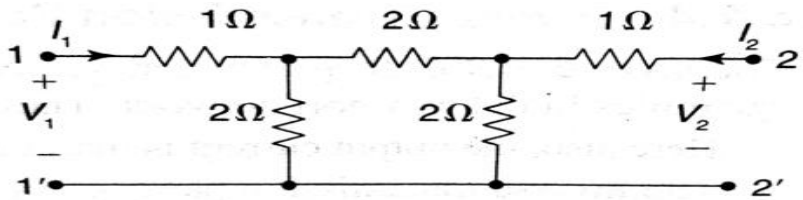
SECTION A

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

a.	Explain the concept of Isomorphism in graph theory.
b.	What is the difference between a tree and a co-tree in graph theory?
c.	What is the maximum power transfer theorem?
d.	Define natural response and forced response in transient circuits.
e.	What is the condition of reciprocity and symmetry in Z and h parameters.
f.	Explain the concept of poles and zeros in network functions.
g.	Define a positive real function and state its properties.

SECTION B

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

a.	Define the following (i) Branch (ii) Graph (iii) Node (iii) Planar and non-Planar Graph (V) Loop or circuit
b.	Determine Norton's equivalent for the following circuit across terminal a-b. 
c.	In the network of Fig., the switch is initially at the position 1 for the long time. At t = 0, the switch is changed to the position 2. Find current i(t). 
d.	Examine the values of t parameters in the given circuit. 

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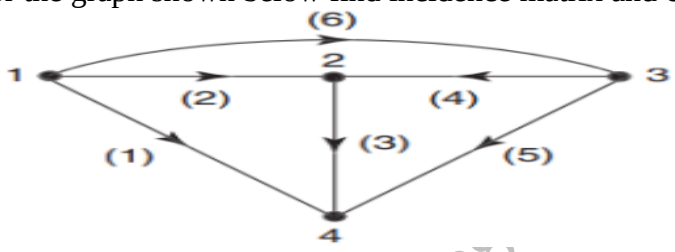
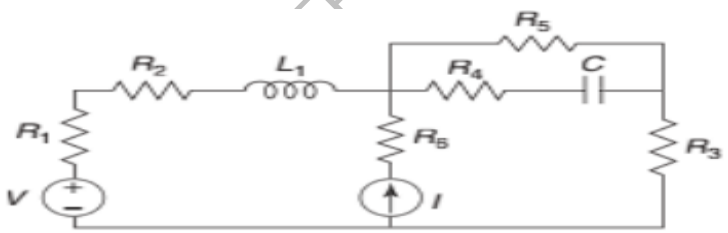
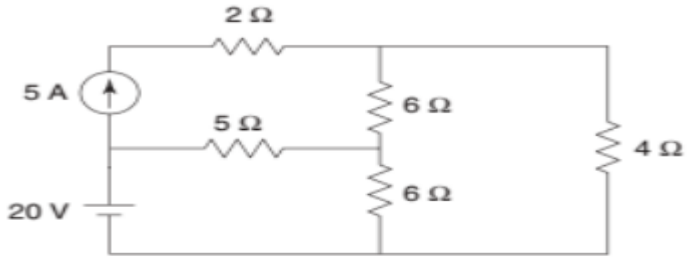
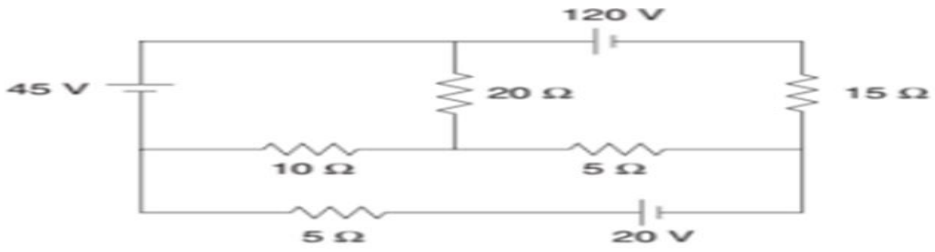
e.	Explain the possible circuit diagram using foster I form. $Y(s)= s^2+2s/s^2+4s+3$

SECTION C

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

(a)	For the graph shown below find incidence matrix and cut set matrices 
(b)	For the circuit shown, draw the oriented graph and write the (a) incidence matrix, (b) Tie set matrix, and (c) Cut set matrix. 

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

(a)	Find the current through the 4 Ω resistor using superposition theorem. 
(b)	Calculate the current through the 20 Ω resistor using Thevenin's Theorem 

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

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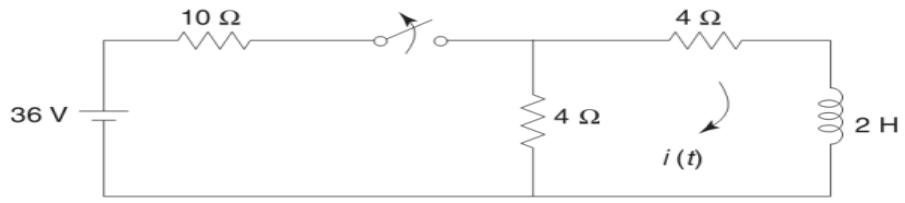
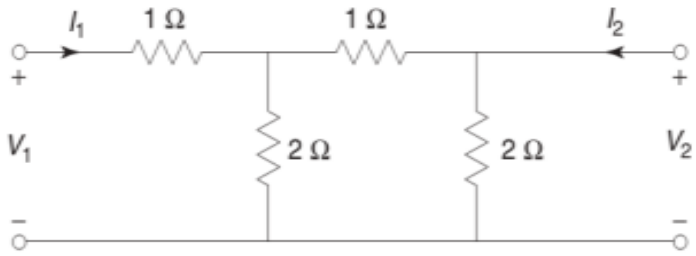
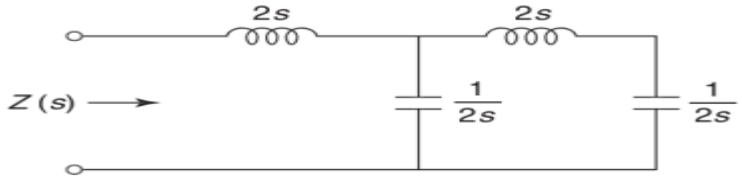
(a)	Derive the relation of capacitor voltage (V_c) and inductor current (I_L) for source free RC and RL network.
(b)	In the network of Fig. below, the switch is opened at t =0. Find the value of i(t) ? 

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

(a)	Find Z parameter for the network given below and determine whether the network is symmetrical and reciprocal 
(b)	Determine the driving-point impedance of the network shown 

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

(a)	Synthesize the given network using foster II form $Z(s)= s(s^2+4)/2(s^2+1)(s^2+9)$
(b)	Explain the frequency response analysis and transfer functions of the passive low pass filter and high pass filter.