

**B. TECH**  
**(SEM IV) THEORY EXAMINATION 2018-19**  
**NETWORK ANALYSIS AND SYNTHESIS**

Time: 3 Hours

Total Marks: 70

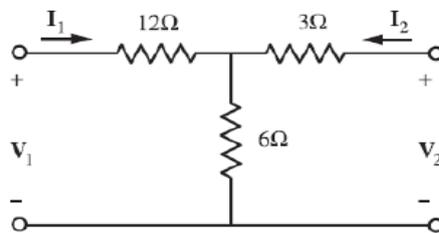
Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

1. Attempt *all* questions in brief.

2 x 7 = 14

- a. Compare dependent & Independent sources.
- b. Give statement of Tellegen's Theorem.
- c. Define tree, twig, links.
- d. Define principle of duality.
- e. What is transient and steady state response?
- f. Find out  $Z_{11}$ ,  $Z_{21}$  for the following network-



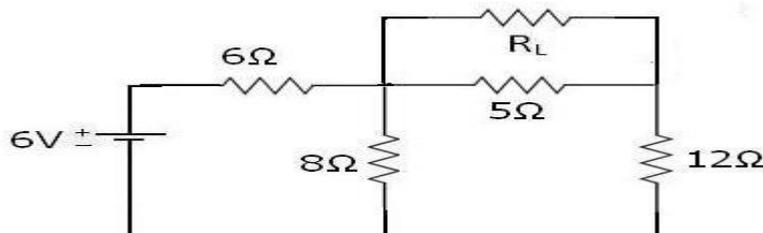
- g. Find reciprocity condition in Y parameter.

**SECTION B**

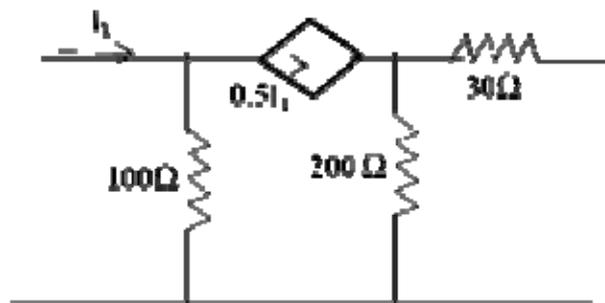
2. Attempt any *three* of the following:

7 x 3 = 21

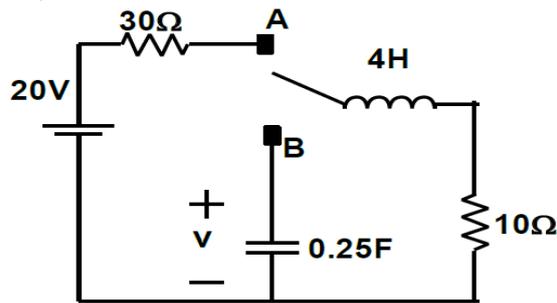
- a. State Maximum power transfer theorem also determine the maximum power transfer to the load  $R_L$  for the following Circuit-



- b. Define with suitable example: (i) Incidence matrix (ii) Cut Set Matrix.
- c. Determine Y parameters for the network shown in figure-



- d. In the circuit shown in Fig., the switch is moved from A to B at  $t=0$ . Find  $v(t)$  for  $t>0$ .

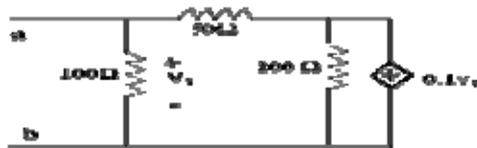


- e. Synthesize (i)  $Z(s) = (s + 1)(s+3) / [(s+6)s]$  in cauer - I form.  
 (ii)  $Z(s) = (s + 5) / [(s+1)(s+6)]$  in Foster's - II form.

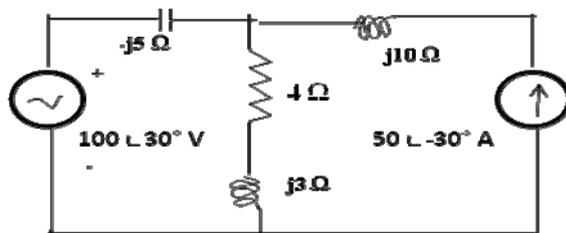
SECTION C

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

- (a) Find the Norton's equivalent of network shown in figure.

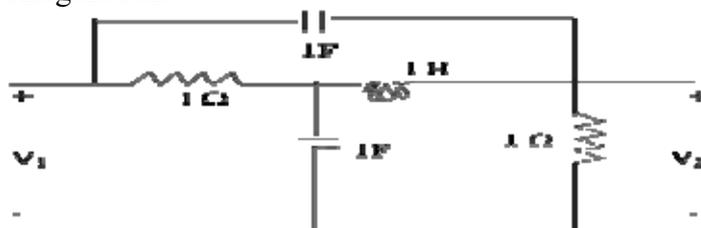


- (b) Using super position theorem, find the voltage across  $(4+j3) \Omega$  in the network shown in figure-



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

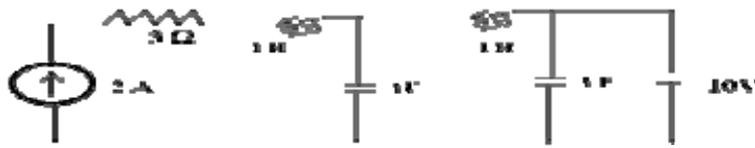
- (a) Obtain  $V_2 / V_1$  of the network shown in figure. Also find pole zero configuration.



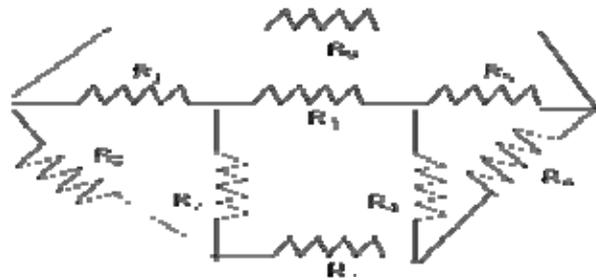
- (b) For R-C Series circuit switch is closed at  $t=0$ , find out current expression also draw its transient curve.

5. Attempt any *one* part of the following:

- (a) Obtain the dual network of the network shown in figure.

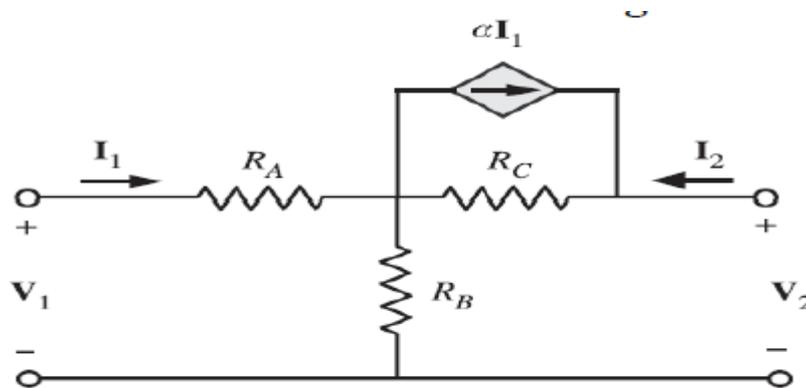


- (b) Draw a graph of resistive network shown in figure. Select a suitable tree and obtain the tie set Matrix.



6. Attempt any *one* part of the following:

- (a) Prove that the overall Z parameters of series connected two port networks are the sum of corresponding Z parameters of the two networks
- (b) Determine h parameters for the network shown in figure-



7. Attempt any *one* part of the following:

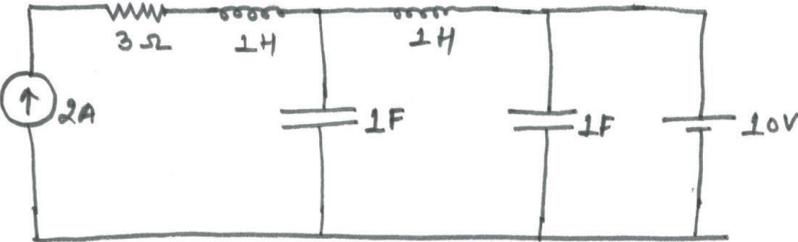
- (a) Define active, passive filters. List advantages of active filter over passive filter.
- (b) Write five necessary conditions for positive real function. Test whether given

polynomial is positive real function or not.  $Z(S) = \frac{S^2 + 2S + 25}{S + 4}$

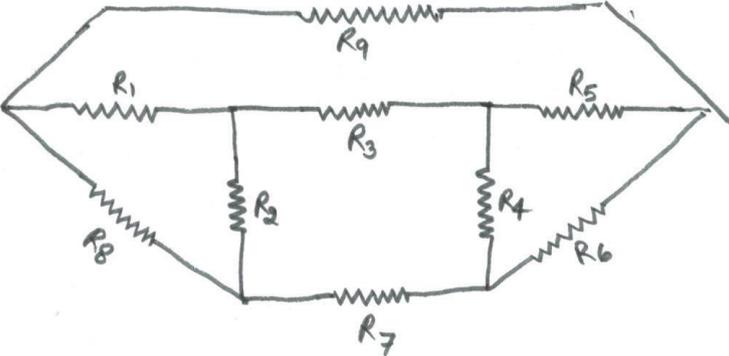
**CORRECTION IN FIGURES OF REE405**

Figures

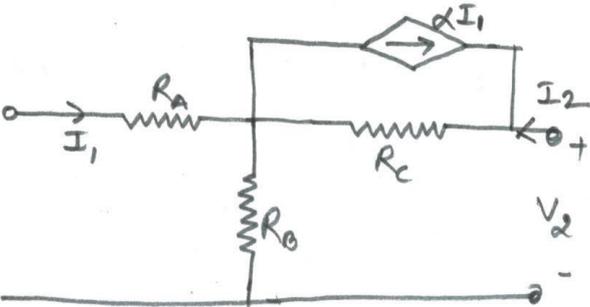
(5a)



(5b)

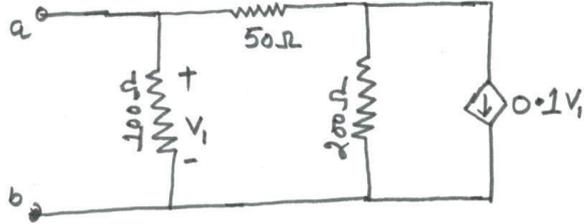


(6b)

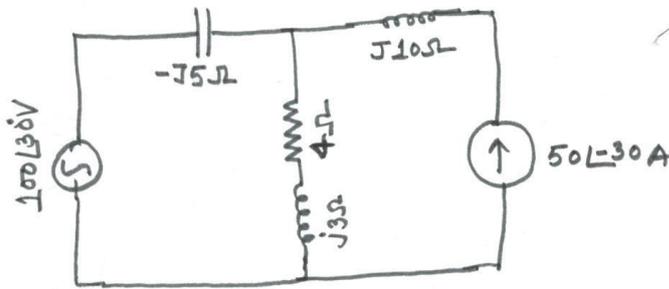


Figures

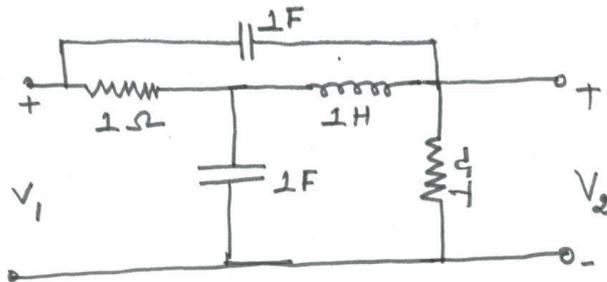
3a)



3b)



4a)



Q.7a)

$$Z(S) = (S^2 + 2S + 25) / (S + 4)$$