**Printed Pages:03**                                    **Sub Code: REE405**
**Paper Id:**    **120254**                        **Roll No.** ☐☐☐☐☐☐☐☐☐☐☐

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

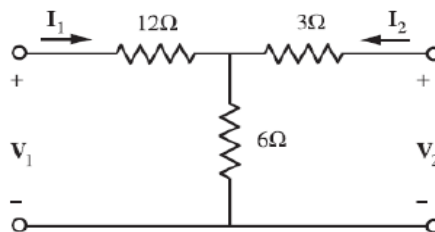*Time: 3 Hours*                                        *Total Marks: 70*

**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?
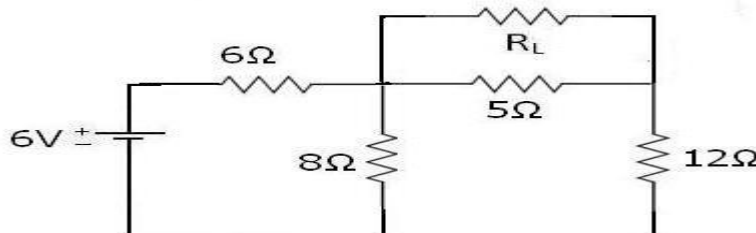
f. Find out $Z_{11}$, $Z_{21}$ for the following network-



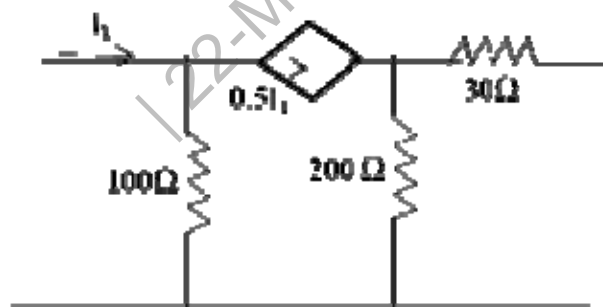g. Find reciprocity condition in Y parameter.

### SECTION B

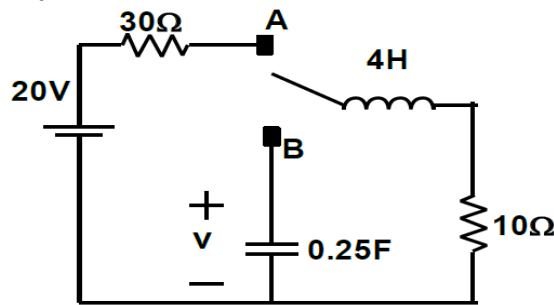**2.** **Attempt any** *three* **of the following:**                    **7 x 3 = 21**

a. State Maximum power transfer theorem also determine the maximum power transfer to the load RL 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.



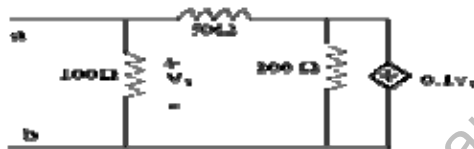e. Synthesize (i) Z (s) = (s + 1)(s+3) / [(s+6)s] in cauer - I form.
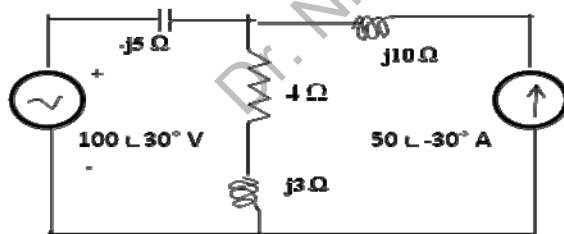(ii) Z (s) = (s +5)/ [(s+1)(s+6)] in Foster's - II form.

## 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.
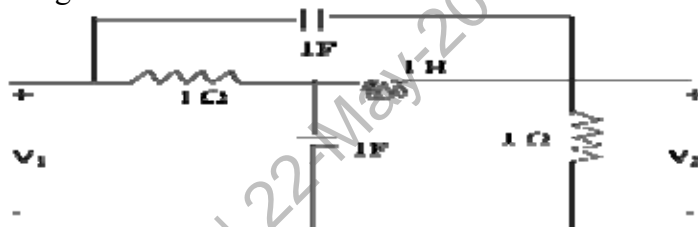


(b) Using super position theorem, find the voltage across (4+j3) Ω in the network shown in figure-


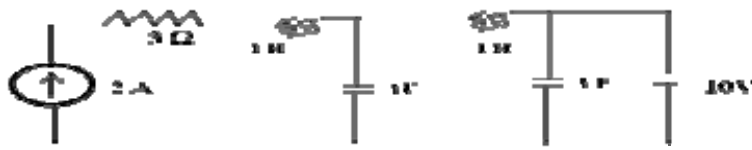
4. **Attempt any *one* part of the following:** 7 x 1 = 7

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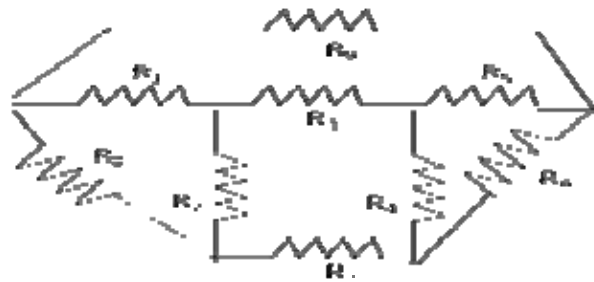


(b) For R-C Series circuit switch is closed at t=0 , find out current expression also draw its transient curve.

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

(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:** 7 x 1 = 7

(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-
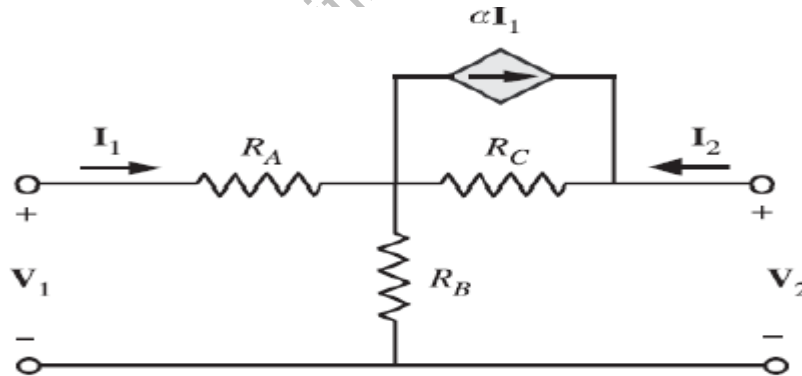


**7.** **Attempt any *one* part of the following:** 7 x 1 = 7

(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. $Z(S) = \dfrac{S^2 + 2S + 26}{S + 4}$