Printed pages: 02 **Sub Code: EE301**

Paper Id 120306 **Roll No.**

B. TECH.
THEORY EXAMINATION (SEM–III) 2018-19
NETWORK ANALYSIS ANS SYNTHESIS

Time : 3 Hours ***Max. Marks : 100***

Note: *In case of numerical problem assume data wherever not provided.*

SECTION – A

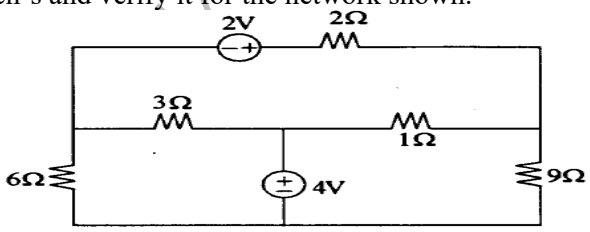
1 . Attempt all of the following questions: **10 x 2 = 20**

(a) Define planar graph?
(b) State reciprocity theorem.
(c) State two properties of the R-L driving point impedance function.
(d) Write the equation of hybrid parameter.
(e) What is duality?
(f) Briefly describe the principle of Norton's theorem.
(g) What is application of transmission parameter?
(h) Write down the properties of incidence matrix.
(i) What is the required parameter of an ideal filter?
(j) Defined cascade connection in two port network.

SECTION – B

2. Attempt any three of the following questions: **3 x 10 = 30**

(a) Explain the Tellegen's and verify it for the network shown.



(b) Explain in detail with diagram the interconnection of two port network.
(c) Derive the condition for symmetry and reciprocity for Z parameters.
(d) Find the cauer forms of RL impedance functions

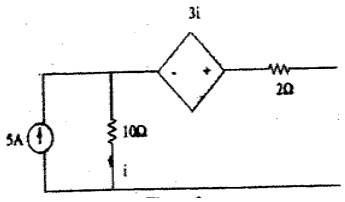
$$Z(s) = \frac{2(s+1)(s+3)}{(s+2)(s+6)}$$

(e) State and proved Millman's theorem.

SECTION – C

3. Attempt any one part. **1 x 10 = 10**

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



(b) For the given network, draw the pole zero diagram and hence obtain the time response I(t).

$$I(s) = \frac{5s}{(s+1)(s^2+4s+8)}$$

4. Attempt any one part. **1 x 10 = 10**

(a) State and proved the maximum power transfer theorem applied to the AC circuit.

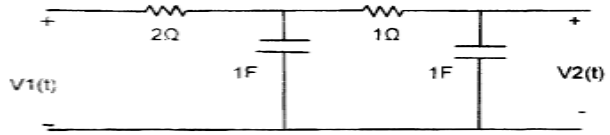
(b) Test whether the polynomial P(s) Hurwitz or not.

(i) $s^5 + 3s^2 + 2s$

(ii) $s^6 + 5s^3 + 5s^2 + 4s + 10$.

5. Attempt any one part. **1 x 10 = 10**

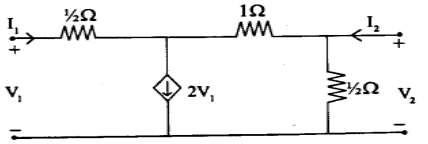
(a) Determine voltage transfer function $V_2(s)/V_1(s)$ for the network shown in figure.



(b) Write the necessary condition for driving point function and transfer function.

6. Attempt any one part. **1 x 10 = 10**

(a) Find the Y and Z parameter of the network.



(b) Design a low pass filter both π and T network having a cut-off frequency of 1 KHz to operate with a terminated load resistance of 200Ω.

7. Attempt any one part. **1 x 10 = 10**

(a) Find the number of poles in the left half of s plane for a system whose characteristics equation is given is.

$$s^4 + 2s^3 + 3s^2 + 4s + 5 = 0$$

(b) For the given reduce incidence matrix. Draw the graph and hence obtain the f-cutset matrix.

$$\begin{bmatrix} 0 & 0 & 1 & 1 & 1 & 0 & -1 \\ 0 & 1 & 0 & 0 & -1 & 1 & 1 \\ -1 & 0 & 1 & 0 & 0 & -1 & 0 \end{bmatrix}$$