

Roll No.

Total Pages : 03

BT-3/D-19 33009

NETWORK ANALYSIS AND SYNTHESIS
EE 203 E

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt Five questions out of eight questions, selecting at least one question from each Unit. All questions carry equal marks.

Unit I

1. (a) Obtain the kVL network equilibrium equation of graph theory.
- (b) A reduced incidence matrix of a graph is given as :

$$[A] = \begin{bmatrix} 1 & 1 & 0 & 0 & 0 & 1 \\ 0 & -1 & 1 & -1 & 0 & 0 \\ -1 & 0 & -1 & 0 & -1 & 0 \end{bmatrix}$$

obtain the number of possible trees.

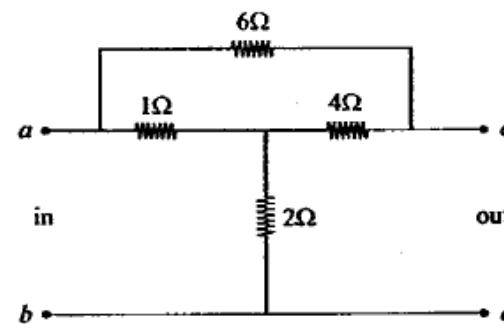
2. (a) A unit step voltage $5u(t - t_1)$ is applied in a series R-C circuit with $R = 5\Omega$, $C = 2F$. Assuming zero initial conditions find $i(t)$.

- (b) A ramp voltage $r(t - 1)$ is applied in series RC circuit at $t = 0$. Assuming zero initial conditions and $R = 2u$,

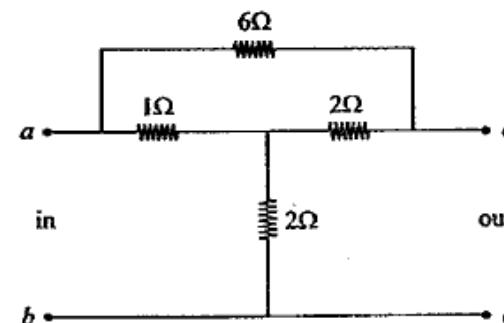
$$C = \frac{1}{2} F$$

Unit II

3. Obtain the T equivalent circuit of the network by using impedance/admittance parameter :

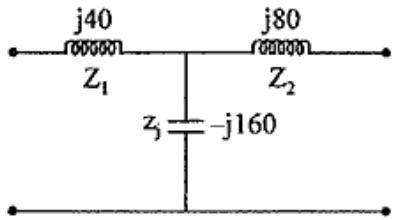


4. Obtain the π equivalent circuit of the network by using impedance/admittance parameters :

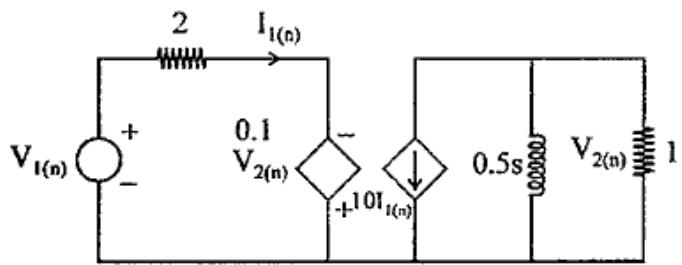


Unit III

5. Find Y parameters of the network shown from z parameter :



6. Find the driving point admittance function and respective pole-zero plot.



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Unit IV

7. Design a T-section constant k-high pass filter having cutoff frequency of 10 kHz and design impedance $R_0 = 600 \Omega$. Find its characteristic impedance and phase constant at 25 kHz.

8. Check whether the following function in Hurwitz or nor :

$$P(s) = s^4 + s^3 + 3s^2 + 2s + 2$$