

01-01-2020

Roll No.

Total Pages : 05

BT-3/D-19

33140

NETWORK THEORY

EC-213A

Time : Three Hours]

[Maximum Marks : 75

Note : All questions in Part A and Part B are compulsory.
Attempt any *four* questions from Part C, selecting at
least *one* question from each Unit.

Part A

1. Answer the following questions : 5×3=15

- (i) Explain the properties of incidence matrix in a graph.
- (ii) Explain impulse function and unit step function.
- (iii) What are energy sources ?
- (iv) Explain π section network.
- (v) Check whether the polynomial $s^5 + s^3 + s$ is Hurwitz or not.

Part B

20

Note : Attempt all questions.

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P.T.O.

Unit I

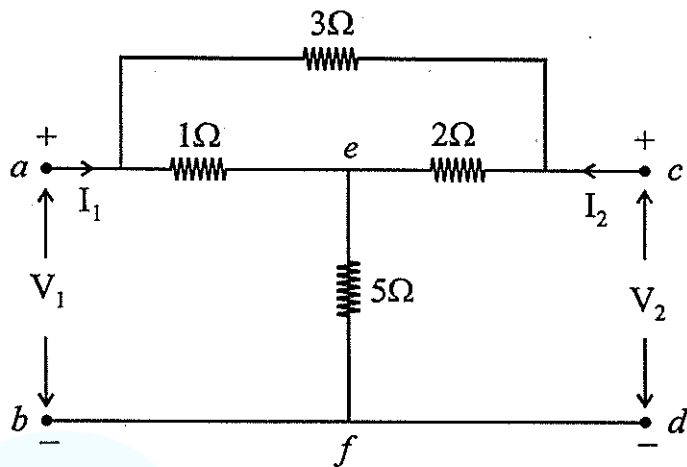
2. Determine the step response of RL parallel circuit. 5

Unit II

3. Explain necessary conditions for transfer function. 5

Unit III

4. Determine open circuit parameter for given circuit. 5



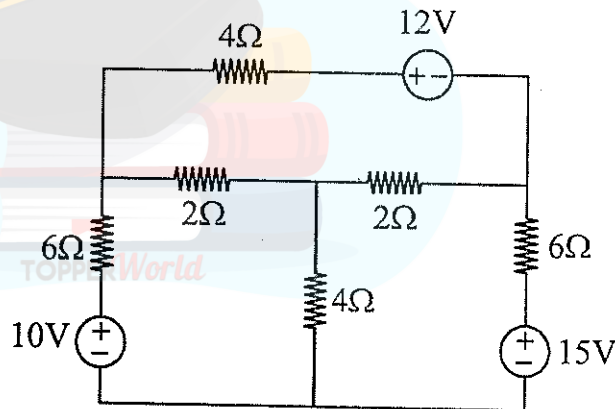
Unit IV

5. Design an m derive T section for high pass filter having cutoff frequency 5 KHz. Design impedance 600Ω and frequency of infinite attenuation of 10.5 KHz. 5

Note : Attempt *one* question from each Unit.

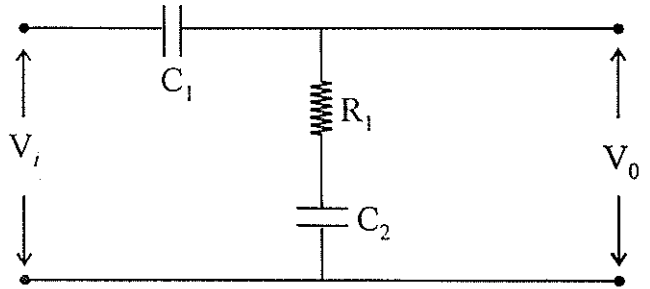
Unit I

6. In a series RC circuit, the resistance is of 2Ω while capacitor is of $1/4F$. Find the transfer function of voltage and drop across the capacitor assuming supply voltage to be $V_0(t) = t u(t)$. 10
7. A network has been shown in Fig. Write down the tieset matrix and obtain network equilibrium equation in matrix form using KVL. Calculate loop currents. 10

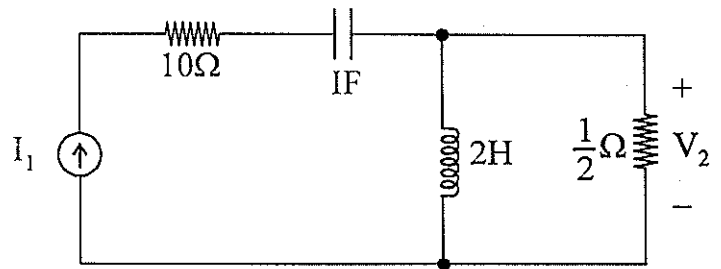


Unit II

8. Find the voltage transfer ratio of network given.



9. Find the pole zero plot of driving point and transfer impedance of network. 10



Unit III

10. Derive the relationship of Y parameters in terms of Z, ABCD and h-parameters. 10
11. Derive the transient response in series RC circuit with DC excitation. 10

Unit IV

12. Find the First and Second Foster form of driving point function : **10**

$$Z(s) = 8(s^2 + 4)(s^2 + 25) / s(s^2 + 16)$$

13. Explain positive real functions with its properties. **10**

