

Roll No.

Total Pages : 04

BT-3/D-20

43140

NETWORK THEORY

EC-213A

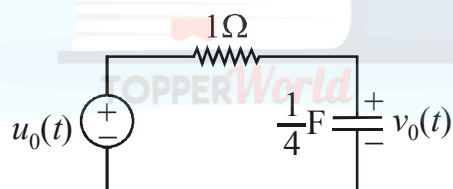
Time : Three Hours]

[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

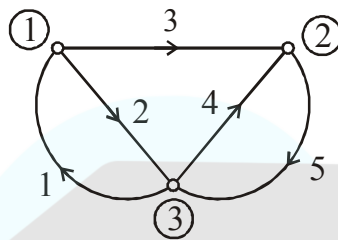
1. Answer the following questions : 5×3=15
- (i) Explain the properties of tree in a graph.
 - (ii) Assuming $v_0 = t u(t)$, find $i(t)$ in RC circuit of figure shown.



- (iii) Define energy sources.
- (iv) Explain T section network.
- (v) Check whether the polynomial $s^4 + 7s^3 + 4s^2 + 18s + 6$ is Hurwitz or not.

Part B

2. In the tree link graph of given figure, develop the fundamental cutset matrix and equilibrium index on nodal basis. 5



3. Enlist the restriction on location of poles and zeros in driving point function. 5
4. Derive z -parameters for two port network. 5
5. Design an m derive T section for low pass filter having cutoff frequency 7 kHz, design impedance 600Ω and frequency of infinite attenuation of 10.5 kHz. 5

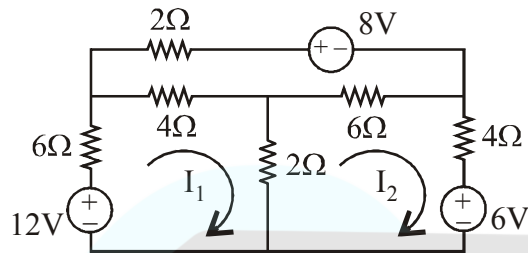
Part C

Unit I

6. Derive the expression for impulse response in a series RLC circuit. 10

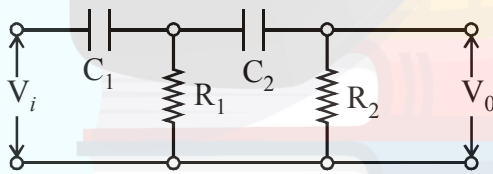
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7. A network has been shown in fig. Write down the tieset matrix and obtain network equilibrium equation in matrix form using KVL. Calculate loop currents : **10**

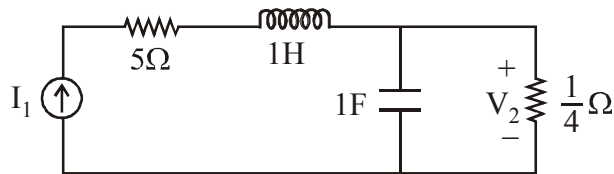


Unit II

8. Find the voltage transfer ratio of network given : **10**



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



Unit III

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

Unit IV

12. Find the first and second Foster form of driving point function $Z(s) = 2(s^2 + 1)(s^2 + 9)/s(s^2 + 4)$. **10**
13. Explain positive real functions with its properties. **10**

