

Roll No.

Total No. of Pages : 02

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B.Tech.(Electrical Engineering & Industrial Control) (2012 Onwards)  
B.Tech.(EE/Electrical & Electronics/Electronics & Electrical) (2011 Onwards)  
(Sem.-3)

**CIRCUIT THEORY**  
Subject Code : BTEE-301  
M.Code : 57092

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Answer briefly :**

- a. Differentiate between independent and dependent sources.
- b. What do you mean by transient response? Explain.
- c. State reciprocity theorem.
- d. Find the Laplace transform of a unit ramp function.
- e. What is the significance of transfer function? Explain.
- f. Discuss the significance of circuit theory in engineering.
- g. Discuss the need of frequency domain analysis.
- h. What do you mean by network functions? Explain.
- i. Why network synthesis is required? Explain.
- j. List the advantages of m-derived filters.

**SECTION-B**

2. Determine the characteristic impedance and propagation constant of the symmetrical T-network.

- 3 Find the voltage across X and Y using Thevenin's theorem.

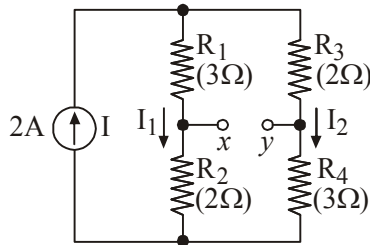


FIG.1

4. Discuss the importance of Laplace transform. Find the Laplace transform of  $\cos \omega t u(t-t_0)$ .
5. Discuss the significance of pole and zeros in a network. Also list the various restrictions on the pole and zero location in transfer functions.
6. What is the need of a filter? Discuss in detail high pass, low pass, band pass and band reject filters.

**SECTION-C**

7. Find the current in 10ohm resistor using superposition theorem.

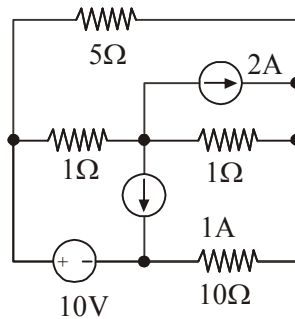


FIG.2

8. Find  $V_2/V_1$  and  $V_2/I_1$  of the figure shown below :

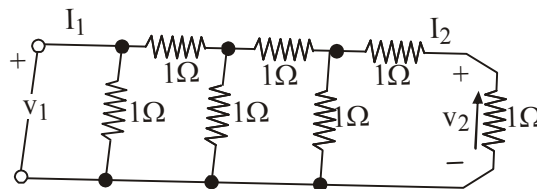


FIG.3

9. Explain the following :
- Design of constant K filter
  - Convolution theorem

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**