Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electrical Engineering) PT (Sem.–1)

# CIRCUIT THEORY

Subject Code : BTEE-301

M.Code : 70971

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 & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

## SECTION-A

**1. Answer briefly :**

a. What do you mean by doublet? Explain.

b. State superposition theorem.

c. Differentiate between time and frequency domain analysis.

d. What do you mean by transfer function? Explain.

e. What do you mean by propagation constant? Explain.

f. Why network synthesis is required? Explain.

g. Write down the disadvantages of constant-K filters.

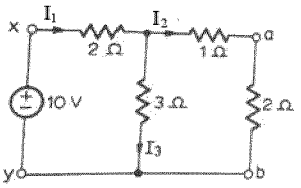
h. What do you mean by impulse response? Explain.

i. What is characteristic impedance? Explain.

j. Compare step and ramp signals.

## SECTION-B

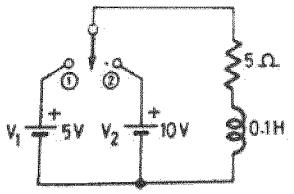
2. Show the application of reciprocity theorem in the network shown below.




3. Explain the concept of pole and zero in a network function and discuss its important features. Also discuss the restrictions on location of poles and zeros in driving point functions.

4. Design an m-derived T section low pass filter having cut-off frequency 7kHz, design impedance 600 ohm and frequency of infinite attenuation 10.5 kHz.

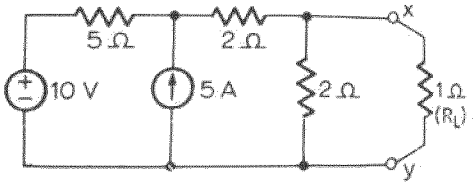
5. Obtain the expression for the current i(t) when switch is moved from position 1 to position 2 at t=0.




## SECTION-C

6. What is a filter? What is its importance in circuit theory? Explain (in detail) the classification of filters.

7. Find the power loss in 1 ohm resistor using Norton's theorem and verify the result using Thevenin's theorem.




8. Design a low pass composite filter to operate with a design impedance of 500 ohms, m=0.2 and cut-off frequency =2000Hz.

9. Discuss the following :

   a. Convolution theorem.

   b. Foster forms by considering a suitable example.

**NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC against the Student.**