



Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EE)/(Electrical & Electronics Engg.)  
B.Tech. (Electronics & Electrical Engg.)  
(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 periodic and singularity voltages.
  - b. State Norton's theorem.
  - c. What do you mean by doublet? Explain.
  - d. What do you mean by transient response? Explain.
  - e. Discuss the significance of circuit theory.
  - f. What do you mean by singlet? Explain.
  - g. What do you mean by propagation constant? Explain.
  - h. Explain passband and stopband with respect to filters.
  - i. What do you mean by the term composite filter? Explain.
  - j. Why network synthesis is required? Explain.

SECTION-B

2. State and prove Maximum power transfer theorem.
3. What do you mean by pole and zero? Discuss its important features and restrictions.
4. Design T section of constant k high pass filter having nominal characteristic impedance of 600 ohm, cut-off frequency is 10 kHz. Also find its characteristics impedance and phase constant.
5. Define Laplace transform. Find the Laplace transform of  $\sin \omega t u(t-t_0)$
6. What is the need of a filter? Discuss the classification of filters in detail.

SECTION-C

7. Find the Thevenin's and Norton's equivalent of the circuit shown in figure, at the terminals A & B.

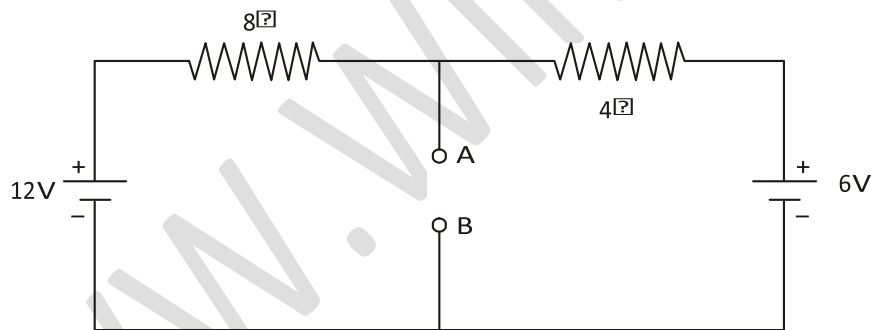


FIG.1

8. Find the first and second Foster or Cauer forms of the function :

$$Z(s) = \frac{(s^2+1)(s^2+3)}{(s^2+2)}$$

9. Discuss the following
  - a. Convolution theorem
  - b. Design of m derived low pass filter

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.

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