Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

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
Paper ID : [A1134]

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) State superposition theorem.

c) What do you mean by doublet? Explain.

d) What do you mean by steady state response? Discuss its significance.

e) What do you mean by impulse response? Explain.

f) What do you mean by network functions? Explain.

g) What do you mean by propagation constant? Explain.

h) List the advantages and disadvantages of composite filters.

i) Why network synthesis is required? Explain.

j) Draw and explain the ladder network.

SECTION-B

2. State and prove Thevenin's theorem.

3. Discuss the following for two port networks :

   a) Impedance and admittance functions.

   b) Transfer functions.

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. Find the current i(t) in a series R-L-C circuit comprising R = 5 ohm, L = 1H and C = 0.25 farad when impulse voltage 3 δ (t-1) is applied.

6. What is a filter? Discuss its significance. Also explain the different types of filters in detail.

SECTION-C

7. Design T and π sections of m-derived low pass filter having cut-off frequency of 1 kHz, design impedance of 400 ohm, and resonant frequency 1100 Hz.

8. Synthesize the Foster I and II forms of realization of the RC driving point function :

$$Z_D(s) = \frac{2s^2 + 12s + 16}{s^2 + 4s + 3}$$

9. Discuss the following :

   a) Convolution theorem.

   b) Maximum power transfer theorem.