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

Total No. of Questions : 09

B.Tech. (Electronics Engg.) (2012 Onwards)

B.Tech. (ECE)/(Electronics & Computer Engg.)
(ETE) (2011 Onwards) (Sem.–3)

NETWORK ANALYSIS AND SYNTHESIS

Subject Code : BTEC-303

Paper ID : [A1127]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION 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 has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   (a) Explain the term Network Synthesis.

   (b) What are Dependent Sources ? Explain with example.

   (c) Define Superposition theorem.

   (d) State and explain Maximum Power Theorem.

   (e) Define Ideal Filter.

   (f) Differentiate between loop and mesh.

   (g) What is the need of Laplace transform ?

   (h) List the demerits of m-derived filters.

   (i) Define positive real function.

   (j) How will you define transfer function? Explain.

SECTION-B

2. State and prove convolution theorem.
3. An impedance function is given by

$$Z(s) = \frac{2(s+1)(s+3)}{(s+2)(s+4)}$$

Find the RL representation of foster first form of network.

4. (a) How can you remove a pole at infinity ?

   (b) How can you remove a pole at zero ?

   (c) What are the necessary conditions of stability of a network function ?

5. Discuss realizability conditions for impedance synthesis of RL and RC circuits.

6. How is open circuit (Z) parameters converted into short circuit (Y) - parameters? Show all steps involved and discuss conditions for reciprocity and symmetry.

SECTION-C

7. Define driving point impedance and admittance. State restrictions on location of poles and zeros in driving point functions. What are the various necessary conditions for transfer condition ?

8. Design a low pass prototype T-section filter having cut off frequency of 2 KHz to operate with a terminated load resistance of 500 ohm.

9. Draw m-derived high pass filter. Plot characteristic impedance, phase shift and attenuation *verses* frequency for m-derived filter.