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

Total No. of Questions : 09

B.Tech.(EE) 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/Fill in the blanks :**

   a. State Maximum Power Transfer Theorem.

   b. A network contains only independent current sources and resistances. If the values of all resistors are doubled, the value of the node voltages will become double. (True/False)

   c. Define quality factor of a series resonant circuit.

   d. What is a transfer function?

   e. Given a m-derived low pass filter has cut-off frequency I kHz, design impedance of 400Ω and the resonant frequency of 1100 Hz. Find the value of k.

   f. Define impedance.

   g. State Reciprocity Theorem.

   h. The network function N (S) becomes _____ when S is equal to anyone of the zeros.

   i. The cut-off frequency of constant k-low pass filter is _____ .

   j. Superposition theorem is applicable only to networks that are _____ .

SECTION B

2. Determine i_2 if all the sources in the given network are time invariant.

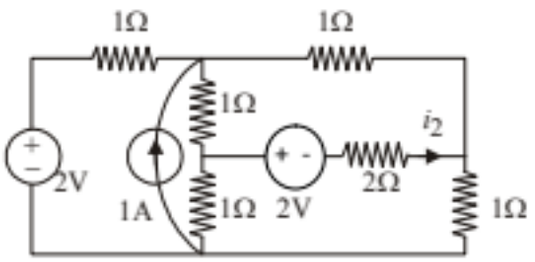

FIG.1

3. Discuss the time domain behaviours from poles and zeros.

4. Discuss the admittance parameters of a two port network.

5. Explain the final value theorem.

SECTION-C

6. What is the propagation constant of pure resistive network?

7. Find the current through 3+4j branch of the given network.

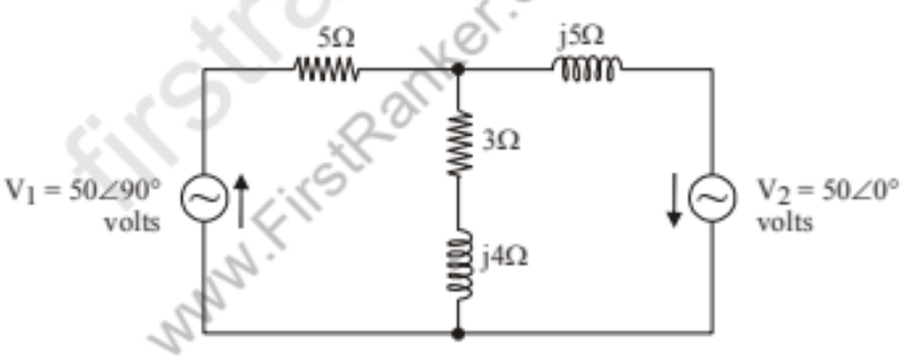

FIG.2

8. Derive an expression for the current response of RLC series circuit with sinusoidal excitation. Assume that the circuit is working in critical damping condition.

9. Using Foster Form I synthesize the following function

$$Z(s) = \frac{s(s^2+9)}{(s^2+5)(s^2+13)}.$$

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.