Total No. of Questions : 09

B.Tech.(EE) (Sem.–3)

ELECTRICAL CIRCUIT ANALYSIS

Subject Code : BTEE-301-18 M.Code : 76381

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. State reciprocity theorem.

b. State superposition theorem.

c. What do you mean by duality? Explain.

d. What do you mean by transient response? Discuss its significance.

e. What do you mean by RMS value? Discuss its importance.

f. What do you mean by coupled circuits? Explain.

g. What is propagation constant? Explain.

h. List the disadvantages of constant-k filters.

i. Differentiate between forced and free responses.

j. Discuss the classification of filters.

SECTION-B

2. Find the Thevenin's equivalent of the network at terminals A and B. Determine the current through the load resistor of 4 ohm connected across the terminals A, B.

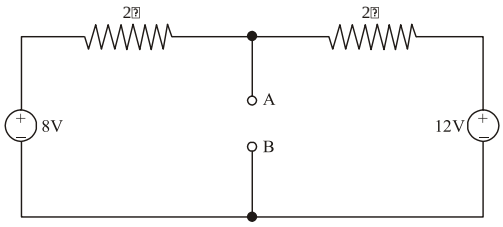

FIG.1

3. In the two port network, compute the hybrid parameters and draw the equivalent circuit from the following data:

   a. With the output terminal short circuited

      $V_1 = 10V$, I_1, $= 1A$, $I_2 = 2A$

   b. With the input terminal open circuited

      $V_1 = 10V$, $V_2 = 50V$, $I_2 = 2A$

4. Design a m-derived low pass filter having cut-off frequency of 100Hz, design impedance of 40 ohm, and the resonant frequency 110Hz.

5. The circuit shown in the figure is initially under steady state condition. The switch is moved from position 1 to position 2 at t = 0. Find the current after switching.

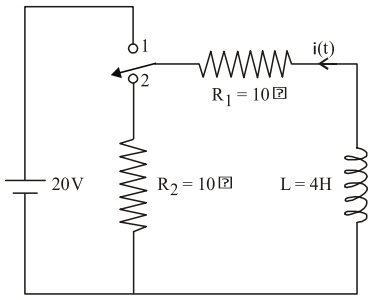

FIG.2

6. A series RLC circuit has R= 50ohm, L= 0.2 H, C = 10μF with an applied voltage of 20V. Calculate the resonant frequency. Find the Q factor of the circuit. Compute the lower and upper frequency limits and also find the bandwidth of the circuit.

SECTION-C

7. Explain :

   a. Node and Mess analysis by considering examples

   b. Parallel resonance

8. Determine the Foster and Cauer form of realization of the driving point impedance function

$$\frac{4(s^2+1)(s^2+9)}{s(s^2+4)}$$

9. Discuss the following :

   a. Routh-Hurwitz stability criterion

   b. Maximum power transfer theorem

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.