Roll No. | | | | | | | | | | | | | Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(EIE) (2011 & Onwards) (Sem.–3)

NETWORK ANALYSIS AND SYNTHESIS

Subject Code : EE-201

M.Code : 57004

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. What do you mean by periodic voltage? Explain.

b. What is loop current? Discuss.

c. State Superposition theorem.

d. What is steady state response? Discuss.

e. Why network analysis is required? Explain.

f. What do you mean by Admittance function? Explain.

g. What do you mean by pass band and stop band? Explain.

h. Discuss the significance of poles and zeros.

i. List the limitations of constant-K filters.

j. Explain briefly the purpose and the scope of network synthesis.

SECTION-B

2. Find R to have the maximum power transfer in the circuit. Also obtain the amount of maximum power.

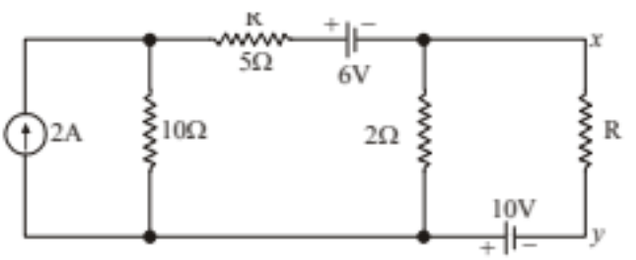

Fig.1

3. The T section constant –K low pass filter has series inductance of 80 mH and shunt capacitance of 0.022μF. Determine the cut-off frequency and nominal design impedance. Also design an equivalent π-section.

4. Find the expression for the voltage transfer ratio for the network shown below :

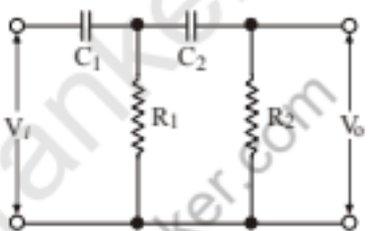

Fig.2

5. Find the current i(t) in a series RC circuit having R = 1 ohm, and C = 0.5F when an exponential voltage v =10 e^{-t} is suddenly applied at t = 0.

6. If u(t) is a unit step function, Find the Laplace transform of the following functions.

   a) $\sin \omega (t-t_0)\, u(t)$

   b) $\sin \omega (t)\, u((t-t_0)$

SECTION-C

7. Explain the following :

   a) Design of m derived filters

   b) Convolution theorem

8. Find the power loss in 1 ohm resistor using Thevenin's and verify the result Norton's theorem

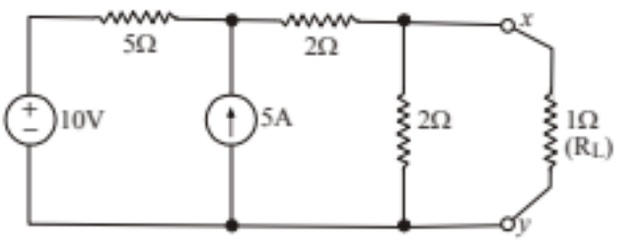

Fig.3

9. For the given function :

$$Z(s) = \frac{(s+1)(s+3)(s+5)}{s(s+2)(s+4)(s+6)}$$

Determine the Cauer, first and second forms of realisation.

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.