Dec-22-0136

EC-303 (Network Analysis & Synthesis)

(ECE, EE, EEE)

B.Tech-3rd (CBCS)

Time : 3 Hours   Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note: Attempt Five questions in all, selecting one question from each Section A, B, C and D. Section E (Q.No. 9) is compulsory.

SECTION A

1. Determine the current I in the network using Thevenin's theorem.
[10]
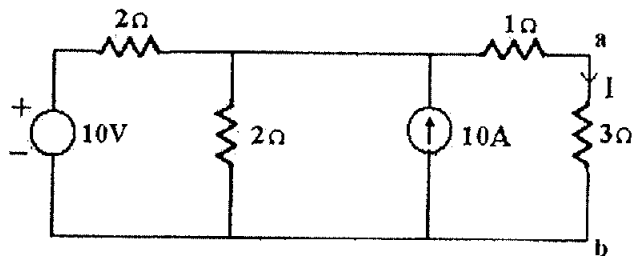

2. Derive the inter-relationship between incidence matrix, Tie-set matrix and cut-set matrix.   [10]

SECTION B

3. Find the Laplace transforms of these functions: $r(t) = tu(t)$, that is, the ramp function; $e^{-at}u(t), a \geq 0$; and $\sin(\omega t)u(t)$.   [10]

4. Derive the expression for transient response of a RL circuit when the DC source is suddenly applied.   [10]

SECTION C

5. Determine the z parameters for the circuit in given Figure.
[10]
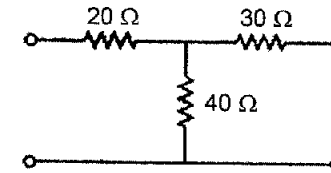
6. Through derivation, express the z parameters in terms of the parameters.   [10]

SECTION D

7. What is network function? Define the terms "Driving point impedance" and "driving point admittance" of a one port network.
[10]

8. Consider the driving point impedance $Z(s)$ to be $Z(s) = \dfrac{(s+3)(s+5)}{s(s+4)}$. Find the Cauer form of RC network.   [10]

SECTION E

9. (a) Derive the condition for a maximum power transfer.   [5]

   (b) What is the major application of Laplace Transform in network analysis?   [5]

   (c) Find the y-parameters for the ∏ representation of a 2-port network.   [5]

   (d) What are the necessary condition of a stability of a network function?   [5]