[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

Dec-24-0316 (CBCS)

EC-303 (Network Analysis & Synthesis) [ECE, EE, EEE]

B.Tech. 3rd

Time : 3 Hours

Max. Marks : 60

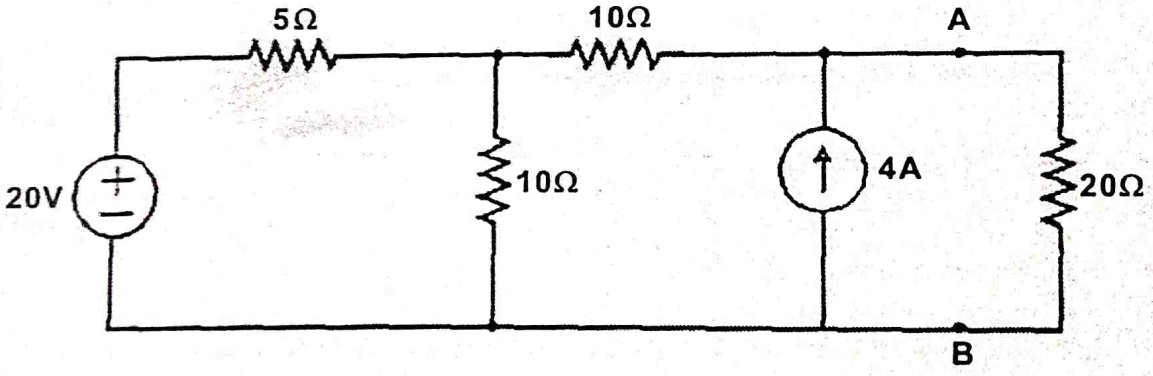
The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Question no. 9 is Compulsory. Attempt four more questions, selecting one question each from section A, B, C & D.

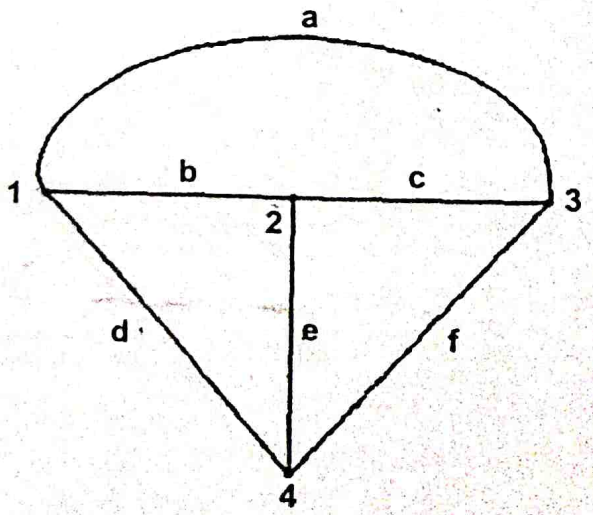
SECTION - A

1. (a) State and explain Thevenin theorem. (5)

   (b) Find the current flowing through 20Ω resistor by first finding a Thevenin's equivalent circuit to the left of terminal A and B. (5)



2. Obtain Fundamental tie set and cut set matrix for graph shown (10)



SECTION - B

3. (a) Explain Laplace Transform with its two properties. (5)

(b) Find inverse Laplace transform of

$$F(S) = \frac{250}{(S+100)(S+50)}$$ (5)

4. Find the expression for transient response of series RC circuit. (10)

SECTION - C

5. (a) Find the relationship between Z and Y parameters of a two port network. (5)

(b) Explain parallel connection of two port network. (5)

6. Explain the following:

(i) Hybrid Parameters

(ii) Condition for Reciprocity and symmetry. (5+5=10)

SECTION - D

7. (a) State the conditions of Positive real function. Also, check Positive realness of following Function:

$$Z(S) = \frac{S^2 + 10\,S + 4}{(S+2)}$$ (5)

(b) The driving point impedance of an LC network is given by

$$Z(S) = \frac{10\,(S^2+4)\,(S^2+16)}{S(S^2+9)}$$

Obtain the first form of Foster network. (5)

8. Explain Network Functions. Discuss the necessary condition of a stability of a network Function. (10)

SECTION - E (Compulsory)

9. (a) What are the poles and zeros of Network function?

(b) What are open circuit impedance parameters?

(c) What are the properties of incidence matrix?

(d) Define the term branch and twig.

(e) State Norton's Theorem.

(f) Obtain Laplace transform of $\cos^2 2t$.

(g) Explain Dot convention in coupled circuits.

(h) What do you mean by Transient Response?

(i) Write note on Sinusoidal excitations.

(j) Write short note on foster form. (10×2=20)