Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC 2ND Semester Examination – July- 2011

Subject code: X20901

Subject Name: Circuits & Networks

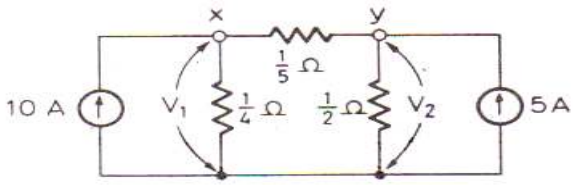
Date:13/07/2011 **Time: 10:30 am – 01:00 pm**

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Find V_1 and V_2 in the network shown below using Nodal analysis. **07**



(b) State and explain the Superposition Theorem. **07**

Q.2 **(a)** Explain: (i) Ideal Sources (ii) Controlled Sources. **07**

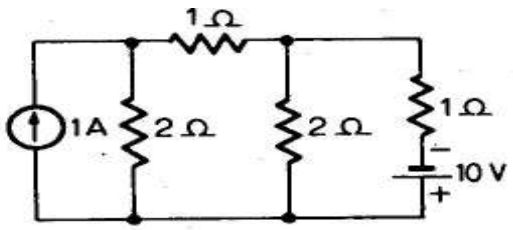
(b) Explain the different techniques for source transformation. **07**

OR

(b) State and explain Kirchoff's Voltage and Current Laws. **07**

Q.3 **(a)** Explain the concept of initial conditions. **07**

(b) Determine the value of the current through the 10 V battery in the following network using Mesh analysis. **07**



OR

Q.3 **(a)** State and explain the Thevenin's Theorem. **07**

(b) Explain: (i) Unilateral and Bilateral Networks (ii) Active and Passive Networks. **07**

Q.4 **(a)** Write a short note on Dot Convention. **07**

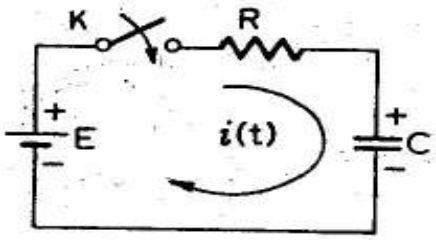
(b) Define: (i) Graph (ii) Tree (iii) Co – tree (iv) Branch (v) Node (vi) Mesh (vii) Loop **07**

OR

Q.4 **(a)** Explain the advantages of Laplace transformation. **07**

(b) State and explain the Maximum Power Transfer Theorem. **07**

Q.5 **(a)** Obtain the expression for current i(t) in the following network using Laplace Transformation. Assume that the capacitor is initially uncharged. **07**



(b) Explain: (i) Inductance parameter (ii) Capacitance parameter. **07**

OR

Q.5 **(a)** Write a short note on poles and zeros of Network functions. **07**

(b) Derive the formula for z – parameters in terms of y – parameters. **07**

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