Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination March 2010

Subject code: 130901 **Subject Name: Circuit & Networks**

Date:10 / 03 /2010 **Time: 11.00 am – 01.30 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)** Define Charge, Current, Potential difference, Voltage, Node, Loop and Independent source. **07**

(b) Using source shifting and source transformation find out the voltage Vx in the figure. **07**

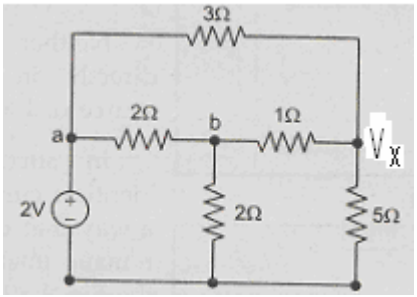

Figure for 1(b)

Q.2 **(a)** Explain Substitution theorem. **07**

(b) Draw the Thevenin's equivalent of the circuit shown in figure and find current through load resistance(between terminal bb). **07**

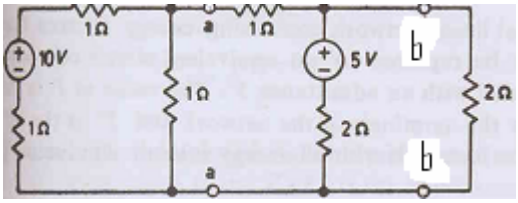

Figure for 2(b)

OR

(b) Find the current in the 5 ohm resistor for the circuit shown in figure using Norton's theorem. **07**

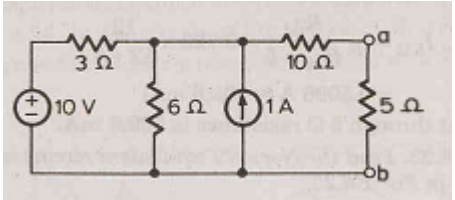

Figure for 2(b)

Q.3 **(a)** Explain KCL and KVL using suitable example. **07**

(b) Using mesh analysis obtain the current through the 10 V battery for the circuit shown in figure. **07**

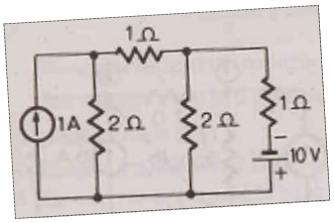

Figure for 3(b)

OR

Q.3 **(a)** Explain Millman's theorem. **07**

(b) Find current and voltage drop through 5 ohm resistor in network shown in figure. **07**

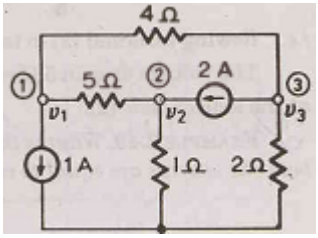

Figure for 3(b)

Q.4 **(a)** Derive expression for rise of current and decay of current in RL series circuit excited by DC voltage source. Discuss the role of time constant in each. **07**

(b) In figure steady state condition is reached with 100 V DC source . At t=0, switch K is suddenly opened. Find the expression of current through the inductor. Also find current through the inductor at t=0.5 second. **07**

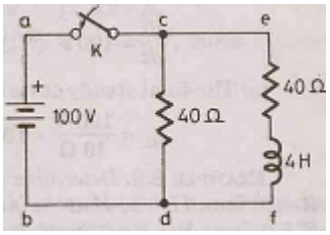

Figure for 4(b)

OR

Q.4 **(a)** Draw and explain equivalent circuit of two port network using h-parameters. **07**

(b) Find the Y-parameter for the circuit shown in figure. **07**

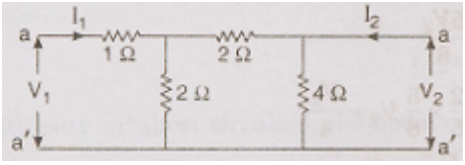

Figure for 4(b)

Q.5 **(a)** Derive inter relationship between incidence matrix (A), fundamental tie set matrix (B_f) and fundamental cut set matrix (Q_f). **07**

(b) For a resistive network shown in figure, draw graph and tree of the network. Also develop the fundamental cut-set matrix. **07**

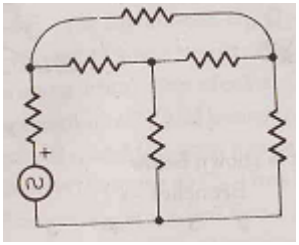

Figure for 5(b)

OR

Q.5 **(a)** State the procedure to obtain solution of a network using laplace transform method.State advantage of laplace method over classical method. **07**

(b) What is meant by poles and zeros of a network function? What is the significance of poles and zeros? Discuss the restrictions on locations of poles and zeros of transfer functions. **07**

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