Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC- SEMESTER–II - EXAMINATION – SUMMER 2017

Subject Code: X20901 **Date:30/05/2017**

Subject Name: CIRCUITS AND NETWORKS

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

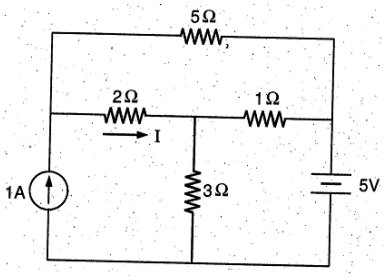
Instructions:

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

Q.1 **(a)** Discuss the following. **07**

1) Linear and Non Linear Element
2) Active and Passive network.
3) Unilateral and Bilateral network.

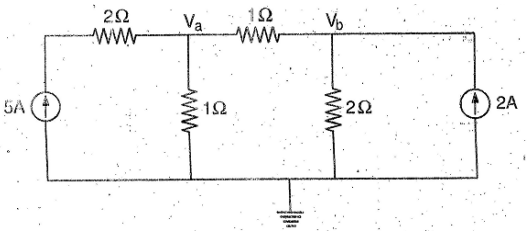
(b) Find the current passing through the 2Ω resistor using Mesh analysis for the circuit shown in the figure. **07**



Q.2 **(a)** Explain the following. **07**

1) Tree 2) junction 3) loop 4) Cut set 5) link 6) Ideal Source 7) Co tree

(b) Using the nodal voltage analysis, find the current in all resistors for the network shown in figure. **07**



Q.3 **(a)** Derive the condition for a maximum power transfer **07**

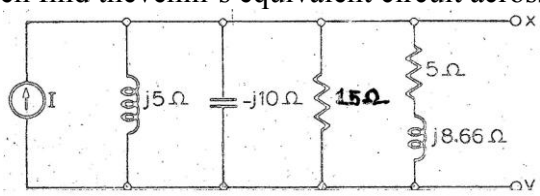
(b) Discuss the techniques of Source transformation. **07**

Q.4 **(a)** Derive the initial and final value theorem of Laplace transform. **07**

(b) Discuss initial conditions in basic elements of network **07**

Q.5 **(a)** Derive formulae to convert given 'Y' parameters into 'h' parameters. **07**

(b) I = 33∠-13 amp then find thevenin's equivalent circuit across x-y. **07**

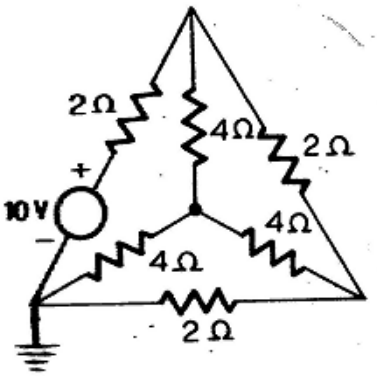


Q.6 **(a)** State and explain Super position theorem. **07**

(b) The open circuit impedance parameters of a two port network are **07**
Z_{11}= 5Ω , Z_{12}= 3Ω, Z_{21}= 3Ω, Z_{22}= 4Ω . Determine ABCD parameters. Also check network is reciprocal and symmetrical or not.

Q.7 **(a)** State and explain Thevenin's theorem. **07**

(b) Write down fundamental loop matrix and Incidence matrix for given figure. **07**



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