

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: X 20901

Date: 16/01/2013

Subject Name: Circuit and Network

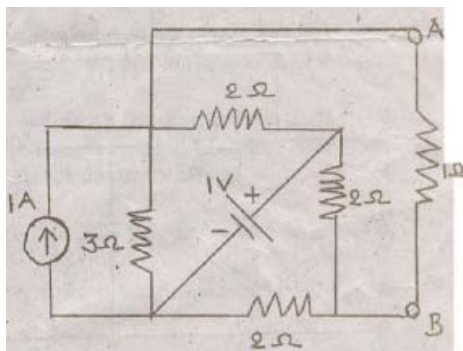
Time: 10.30 am - 01.00 pm

Total Marks: 70

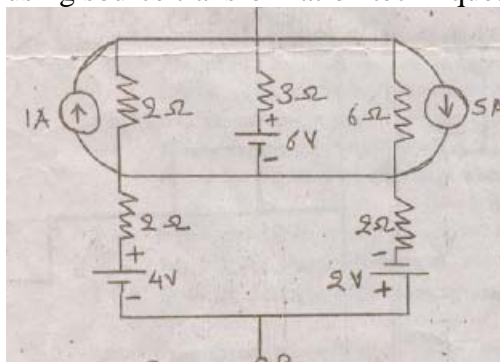
Instructions:

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

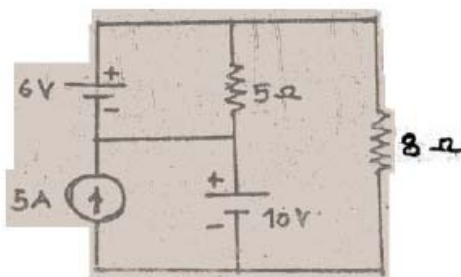
- Q.1(a) Explain Dot convention with suitable Example. 06
- Q.1(b) Derive the inter-relationship between incidence matrix, Tie-set matrix and cut-set matrix. 06
- Q.1(c) Give the difference between mesh and node. 02
- Q.2(a) Find the current through branch AB in this figure given below by Thevenin's theorem. 06



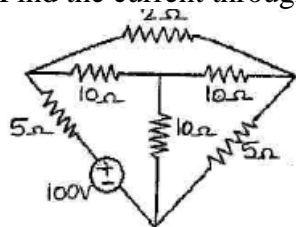
- Q.2(b) Derive the equivalent circuit with voltage source in series with resistance by using source transformation technique. 06



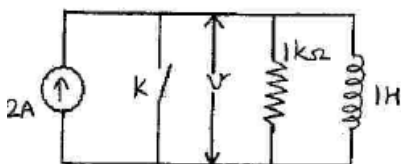
- O.2(c) State Millman's theorem. 02
- Q.3(a) Find all mesh currents by using mesh analysis method. 05



- Q.3(b) Explain the concept of Super-mesh and Super-node with one suitable example for each. 06
- Q.3(c) Write the property of laplace transform. 03
- Q.4(a) Explain and obtain the Laplace transform of the following: 09
- 1) Unit impulse 2) Unit step and 3) Unit ramp function
- Q.4(b) Explain the concept of complex frequency. 05
- Q.5(a) Find the current through 2 ohm resistance by Norton's theorem. 05



- Q.5(b) Draw the graph, tree and co-tree for the figure given in above question. 05
- Q.5(c) Draw the dual network of above given network. 04
- Q.6(a) Derive the symmetry and reciprocity condition for transmission parameter 10
- Q.6(b) Give the application of h-parameter and also state the relation between h-parameter with transmission parameter. 04
- Q.7(a) In the given figure below switch K is opened at $t = 0$. Find the v , dv/dt and d^2v/dt^2 at $t = 0+$. 05



- Q.7(b) What is network function? Define the terms "Driving point impedance" and "driving point admittance" of a one port network. 05
- Q.7(c) Derive the condition for a maximum power transfer 04
- a) When load consist of a variable resistance
- b) When load consist of a variable resistance and variable reactance
