

**USELT01 - Electronics Paper-I (Network Analysis and Digital Fundamentals)**

P. Pages : 2

Time : Three Hours

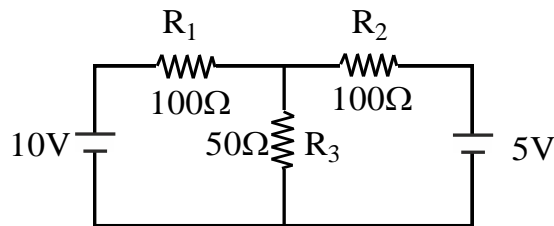
**GUG/W/22/11548**

Max. Marks : 50

- Notes :
1. All questions are compulsory and carry equal marks.
  2. Draw neat and labelled diagram wherever necessary.
  3. Use of logtable/calculator is allowed.

Either

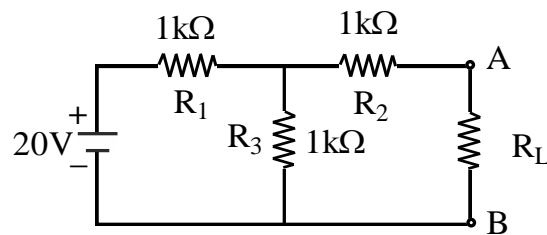
1. a) Differentiate between ideal and practical voltage source. 3+4  
 State Kirchoff's current & voltage law. +3  
 Find the current through resistor  $R_3$  using Kirchoff's law in the following network.

**OR**

- b) Explain star and Delta networks. 4+6  
 State and prove superposition theorem.

Either

2. a) State and prove Norton's theorem. 6+4  
 Find the Thevenin's equivalent circuit of the following network.

**OR**

- b) State and prove maximum power transfer theorem. 6+4  
 Explain the z-parameters of two port network.

Either

3. a) Explain the method of binary to decimal and decimal to binary conversion with suitable example. 6+4  
 Explain BCD code with suitable examples.

**OR**

- b) Explain : 6+4
- i) Gray code
  - ii) Parity code
- perform the following operation.
- i)  $(101101)_2 + (01101)_2 = (---)_2$
  - ii)  $(48)_{16} + (A2)_{16} = (---)_{16}$
  - iii)  $(347)_8 + (023)_8 = (---)_8$
  - iv)  $(11010)_2 - (1101)_2 = (---)_2$

Either

4. a) Explain the basic gates. What is universal gate? 3+7  
 Draw the logic diagram of basic gates using NAND gates.

**OR**

- b) State and prove De Morgans theorem. 6+4  
 Draw the logic diagram of 4 bit control inverter using XOR Gate and explain it.

5. Attempt **any ten** of the following. 10

- a) What is ideal current source?
- b) What is mesh?
- c) State principle of duality.
- d) State Thevenin's theorem.
- e) What is two port network?
- f) State h-parameters of two port network.
- g) What is base or radix?
- h) What is 1's complement?
- i) What is signed binary number?
- j) Draw the logic diagram of EX-OR gate using basic gates.
- k) State combinational gate?
- l) State double inversion theorem.

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