

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

P. Pages : 2

GUG/W/19/11548

Time : Three Hours

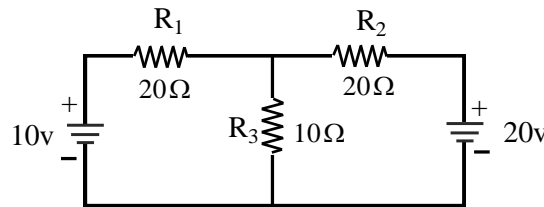


Max. Marks : 50

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

1. Either

- a) State and explain superposition theorem. Using super position theorem calculate current flowing through 10Ω resistor in the following circuit. 5+5

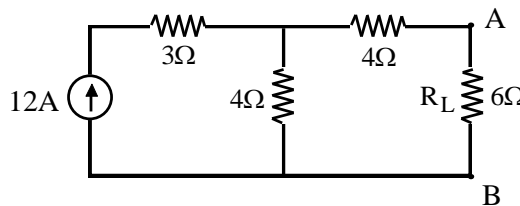


OR

- b) State and prove Kirchhoff's voltage and current laws using suitable example. What is ideal and practical voltage source? Explain their characteristics. 6+4

2. Either

- a) State and prove Norton's theorem. Using Norton's theorem. Calculate current flowing through R_L in the following network. 6+4



OR

- b) State and prove maximum power transfer theorem. State Reciprocity theorem. 7+3

3. Either

- a) Define following terms: 5+5

- | | |
|----------|----------|
| i) Radix | ii) MSB |
| iii) LSB | iv) Byte |
| v) Byte | |

Perform following conversions:

- i) $(3CF. 2B)_{16} = (\text{-----})_2$.
- ii) $(101011.10)_2 = (\text{-----})_{16}$.

OR

- b) What is 1^s complement? Explain perform following subtraction using 1^s complement. **6+4**
 i) $(10101)_2 - (1101)$ ii) $(1011)_2 - (10001)_2$
 What is parity code? Explain its importance.

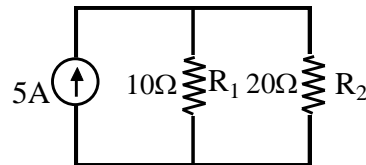
4. Either

- a) Give symbol, truth table and Boolean equation of the following logic gates. **6+4**
 i) AND ii) OR
 iii) EX-OR iv) NAND
 State and prove Demorgan's theorem for two variables.

OR

- b) Explain why NAND and NOR gate are called universal gates? **4+6**
 Construct following gates using NAND gates only.
 i) EX-OR gate. ii) EX-NOR gates.

- 5.** Attempt **any ten** of the followings. **1x10**
=10
 a) State the principle of duality.
 b) Find the current through R_2 in the circuit given below.



- c) State the theorem of reciprocity.
 d) What is node in network?
 e) Convert $(52)_{10} = ()_{BCD}$.
 f) What is gray code?
 g) Find excess-3 code of 4 and 6.
 h) Draw symbol and Boolean equation of NOT gate.
 i) Prove that $A.1 = A$.
 j) Draw a logic circuit of controlled inverter.
 k) What is star network?
 l) State z-parameters in two port network.
