

B.Sc. (CBCS Pattern) Semester-I
USELT01 - Electronics-I - Network Analysis and Digital Fundamentals

P. Pages : 2

Time : Three Hours



GUG/W/24/11548

Max. Marks : 50

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

Either:

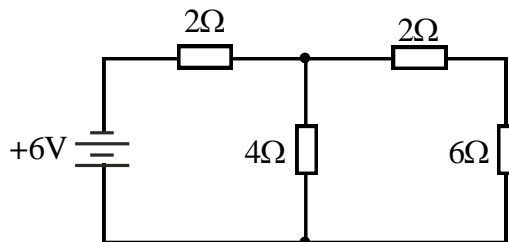
1. a) State and Prove Kirchoff's voltage law with suitable example. 5
- b) What are ideal and practical current sources? Explain ideal and practical voltage sources with their characteristics. 5

OR

- c) State and explain Superposition Theorem. 5
- d) State and prove Kirchoff's Current law with suitable example. 5

Either:

2. a) State and prove Thevenin's theorem. 5
- b) Calculate current through 6Ω resistor in the following circuit using Thevenin's theorem. 5



OR

- c) State and prove Maximum power transfer theorem. 5
- d) State and prove Norton's theorem. 5

Either:

3. a) What is number system? State its types with their bases. Explain double dabble method to convert decimal number in to its equivalent binary with suitable example. 5
- b) What is Binary code? Explain Excess-3 code with suitable example. Where this code is used? 5

OR

- c) What are 1's and 2's Complement? Explain with suitable examples. 5
- d) Perform following subtraction using 2's Complement method. 5
- 1) $(101010)_2 - (10010)_2$
- 2) $(1110)_2 - (11110)_2$

Either:

4. a) What is logic gate? Draw symbol, write Boolean equation and truth table for AND, OR and NOT gates. 5
- b) What is Universal gate? Construct NAND and Ex-OR gate using NOR gates only. 5

OR

- c) What is XOR gate? Draw symbol, Write Boolean equation and truth table of XOR gate. Draw its logic diagram. 5
- d) Explain application of XOR gate as a controlled inverter with suitable logic diagram. 5

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

- a) State the principle of Duality.
- b) Define ideal current source.
- c) Draw circuit for delta network.
- d) State Norton's theorem.
- e) State reciprocity theorem.
- f) Draw two port network.
- g) Write excess-3 of $(0111)_2$
- h) Define parity code.
- i) Convert $(BCD)_{16}$ into Binary.
- j) State DeMorgan's theorem.
- k) State double inversion theorem.
- l) State AND laws
