

9. (A) What is multiplexer ? Explain 4:1 multiplexer. 6
 (B) Explain 3:8 decoder with logic diagram. 4
 (C) Draw logic diagram of 1:4 demultiplexer. 2

OR

10. (P) What is decoder ? Explain 4:16 decoder. 6
 (Q) Explain 16:1 multiplexer with logic diagram. 6



AL - 518

First Semester B. C. A. (Part - I) Examination

DIGITAL TECHNIQUES - I

Paper - 1 ST 3

P. Pages : 4

Time : Three Hours]

[Max. Marks : 60

- Note :** (1) All questions are compulsory.
 (2) Draw well labelled diagrams wherever necessary.

1. (A) Explain conversion of octal to hexa decimal with the help of examples. 6
 (B) Perform the following subtractions using 1's and 2's complement methods :—
 (i) $101011_2 - 100110_2$
 (ii) $110011_2 - 101111_2$
 (iii) $100011_2 - 10001_2$ 6

OR

2. (P) Why are NAND and NOR gates called Universal gates ? Explain with examples. 6

(Q) Perform the following :—

(i) $(AA)_{16} = (\quad)_{10}$

(ii) $(77)_8 = (\quad)_2$

(iii) $(99)_{10} = (\quad)_8$ 6

3. (A) Explain :—

(i) Fan-in, Fan-out.

(ii) Noise immunity. 4

(B) Explain construction and working of ECL. 6

(C) What is meant by totem pole output ? 2

OR

4. (P) State classification of logic families. 3

(Q) Draw circuit diagram of DTL and explain working. 6

(R) Explain working of CMOS inverter. 3

5. (A) State and prove DeMorgan's theorems. 6

(B) Reduce the following equation and draw logic diagram.

$$Y = AB + A\overline{B}C + BC + \overline{A}BC + ABC$$
 4

(C) What are SOP and POS terms ? 2

OR

6. (P) Minimize
 $f(A, B, C, D) = \sum m(0, 1, 2, 4, 8, 9, 14, 15)$ 6

(Q) Explain how truth table can be converted into standard SOP form with the help of example. 4

(R) Draw logic diagram of -
 $Y = A\overline{B}C + \overline{A}C + ABC + BC$ 2

7. (A) Draw logic diagram of half adder and explain working. 4

(B) Describe ALUIC - 74181. 4

(C) Explain Full subtractor with the help of logic diagram. 4

OR

8. (P) Explain Full adder with help of logic diagram and truth table. 4

(Q) Draw logic diagram of controlled parallel adder and explain its action. 6

(R) Draw logic diagram of 4-bit binary adder. 2