



Duration: - 3 Hours

Marks: 80 Marks

NB: - Question 1 is compulsory

Solve any three questions from the remaining.

- 1
- a) Convert decimal number 576.24 into binary, base-9, octal, hexadecimal system. 04
 - b) Construct hamming code for 1010 using odd parity. 04
 - c) Convert $(-89)_{10}$ to its equivalent Sign Magnitude, 1's Complement and 2's Complement Form 04
 - d) Perform $(BC5)_H - (A2B)_H$ without converting to any other base 04
 - e) Prove De Morgans theorem 04
- 2a. Given the logic expression: $A + \overline{B}C + AB\overline{D} + ABCD$ 10
- 1. Express it in standard SOP form.
 - 2). Draw K-map and simplify.
 - 3). Draw logic diagram using NOR gates only.
- 2b. Reduce using Quine McClusky method & realize the operation using only NAND gates. 10
- $F(A,B,C,D) = \prod M(0, 2, 3, 6, 7, 8, 9, 12, 13).$
- 3a. Design a 4-bit binary to gray code converter. 10
- 3b. Design a 4-bit BCD adder using IC 7483 and necessary gates. 10
- 4a. Implement the following logic function using all 4:1 multiplexers with the select inputs as 'B', 'C', 'D', 'E' only. 10
- $F(A,B,C,D,E) = \sum m(0, 1, 2, 3, 6, 8, 9, 10, 13, 15, 17, 20, 24, 30)$
- 4b. Convert a SR flip flop to J K flip flop 10
- 5a. Design a mod-6 synchronous counter using T FF 10
- 5b. Explain the operation of 4-bit universal shift register. 10
- 6 Write short notes on any two 20
- a. VHDL
 - b. TTL and CMOS logic families
 - c. 4-bit Magnitude comparator
 - d. 3 to 8 line decoder