

Time: 3 Hours

Marks: 80

- N.B. (1) Question No. 1 is compulsory
(2) Assume suitable data if necessary
(3) Attempt any three questions from remaining questions

- 1 Attempt any 5
 - (a) Convert $(216.24)_{10}$ into octal, binary and hexadecimal, and base 4. (4)
 - (b) Perform $(76)_{10} - (33)_{10}$ in BCD using 10's complement method (4)
 - (c) Explain Glitch problem. (4)
 - (d) State De Morgan's theorem. Prove NAND is Universal gate. (4)
 - (e) Encode the data bits 110010001 using Hamming code. (4)
 - (f) Explain SOP and POS and solve the following using K-Map
 $F(A,B,C,D) = \sum m(1,5,6,7,10,11,13) + d(2,4)$ (4)
 - (g) Explain parity generator/checker. (4)
- 2 (a) Simplify following function using Quine McCluskey method and realize circuit using basic gates. $F(A,B,C,D) = \pi M(2,7,8,9,10,12)$ (10)
 (b) Explain and Design a BCD adder using 4 bit binary adders. (10)
- 3 (a) Implement 16:1 Mux using 8:1 Mux. (5)
 (b) Explain lockout condition. How can it be avoided. (5)
 (c) Design a 2 bit magnitude comparator. (10)
- 4 (a) Compare different logic families with respect to fan in, fan out, speed, propagation delay and power dissipation. (10)
 (b) Explain 4 bit bidirectional shift register. (10)
- 5 (a) Design mod 10 asynchronous counter using T flipflop (10)
 (b) Convert SR flipflop to JK flipflop and T flipflop. (10)
- 6 Write short note on (any four):- (20)
 - (a) ALU
 - (b) 3 bit Up/Down Asynchronous Counter
 - (c) Priority Encoder
 - (d) 4-bit Universal shift register
 - (e) VHDL