

Q.P. Code: 24867

(3 Hours)

[Max. Marks 80]

N.B

- (1) Question no. 1 is compulsory.
- (2) Attempt any 3 from the remaining questions.
- (3) Assume suitable data if necessary.
- (4) Figures to right indicate full marks.

- Q 1 (a) Prove using Boolean algebra: "NAND gate is Universal gate" 05
- Q 1 (b) A 7-bit even parity hamming code is received as 1000010. Correct it for any errors and extract 4 bit data 05
- Q 1(c) Simplify $F(P,Q,R,S) = \pi M(3,4,5,6,7,10,11,15)$ using kmap and implement using minimum number of gates. 05
- Q 1(d) Explain Johnson Ring Counter 05
- Q 2(a) Reduce equation using Quine McCluskey method and realize circuit using basic gates- $F(A,B,C,D) = \sum m(1,5,6,12,13,14) + d(2,4)$ 10
- Q 2(b) Compare TTL and CMOS wrt to gate, voltage level, fan in fan out, propagation delay 10
- Q 3 (a) What is race around condition? How to overcome it? 10
- Q 3 (b) Implement full subtractor using basic gates 10
- Q 4(a) Design a 32:1 multiplexer using 4:1 multiplexer with suitable diagrams and tables 10
- Q 4 (b) Explain 3 bit asynchronous down counter with timing diagram and truth table 10
- Q 5(a) Explain the working of 4-bit parallel adder. Identify its disadvantage how to overcome it? 10
- Q 5(b) Convert SR flipflop to D flipflop. 10
- Q 6 Write short note on (any 4) 20
- 1) VHDL
 - 2) 4 bit magnitude Comparator
 - 3) Pseudo random number generator
 - 4) Universal Shift Register
 - 5) ALU
