



Digital Circuits and Logic Design (1030)

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** questions from each unit.
5. Figure to right indicate full marks.
6. Assume suitable data if necessary.
7. Use of non - programmable calculators is allowed.

UNIT - I

1. a) Compare CMOS logic family and TTL logic family. Explain the operation of CMOS NAND gate. **10**
b) i) Explain the operation of TTL NAND gate. **5**
ii) Explain the interfacing of TTL driving CMOS. **5**
c) State the various parameter of ECL family. Explain the operation of ECL family with neat sketch. **10**

UNIT - II

2. a) What is necessity of codes ? State individual necessity and application of Gray code, ASC II code, Hamming code and Excess - 3 code. **10**
b) Design Excess - 3 to BCD code converter and using gates, realize it. **10**
c) Minimize the following Boolean expression using K - map and realize it using gates. **10**
i) $F(A,B,C,D) = \sum (1,3,7,11,5) + d(0,2,5)$
ii) $F(A,B,C,D) = \sum (1,3,7,8,10,12,13,15)$

UNIT - III

3. a) i) Design full subtractor. 5
 ii) Design 64:1 mux using 16:1 MUX. 5
 b) i) Realize following function using 2:4 decoder. 5
 $F_1 = \sum m(0,3,4,6)$
 $F_2 = \sum m(1,3,6,7)$
 ii) Write a short note on ALU. 5
 c) Design BCD adder using two IC'S 7483 and NAND gates and explain it with suitable example. 10

UNIT - IV

4. a) i) Explain operation of clocked S - R Flip - Flop. 5
 ii) Convert S - R flip flop in to J-K flip - flop. 5
 b) i) State various applications of shift Register. 5
 ii) Draw and explain in brief J - K - Master - Slave flip flop. 5
 c) Design MOD - 11 Asynchronous counter using T - flip flop. Explain its operation with wave forms. 10

UNIT - V

5. a) Design MOD - 10 synchronous counter using J - K flip flop and realize it. 10
 b) Draw and explain two models and synchronous sequential machine Moore circuit and Malay circuit. 10
 c) Draw and explain in brief ; The block diagram and Function table for IC 74191. 10
