



Digital Systems & Microprocessor (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. Assume suitable data whenever necessary.
6. Draw the neat and labelled diagram whenever necessary.
7. Figure to right indicates.

UNIT – I

1. a) Prove the following using Boolean algebra 10
 - i) $(B + A)(B + D)(A + C)(C + D) = BC + AD$
 - ii) $(A + B)(\bar{A} + C)(B + C) = (A + B)(\bar{A} + C)$
- b) Explain all basic gates. Implement all basic with the help of any universal gate (NAND / NOR) by using Demorgan's Law. 10
- c) Write short note on following : 10
 - i) TTL
 - ii) CMOS

UNIT – II

2. a) Simplify following logic expression and implement using basic gate. 10
 - i) $F(A, B, C, D, E) = \sum m(0, 1, 2, 3, 10, 12, 13, 14, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31)$
 - ii) $F(A, B, C, D, E) = \pi m(2, 3, 5, 8, 9, 10, 11, 17, 18, 19, 21, 24, 25, 26, 27, 29)$

- b) For the following logic expression 10
 i) prepare Truth Table
 ii) minimize using k-map.
 iii) Implement using proper universal gate

$$F = ABC\bar{D} + \bar{B}\bar{C} + AB\bar{C}D + \bar{B}C + \bar{B}D$$
- c) Explain half adder and full adder in detail. Construct the full adder circuit using two half adder circuit and one OR gate. 10

UNIT – III

3. a) Write short note on : 10
 i) J – K flip flop
 ii) one bit memory cell.
- b) Design a two bit comparator. 10
- c) Construct 16 : 1 mux using 4 : 1 mux. 10

UNIT – IV

4. a) Draw and explain memory read cycle of 8085. 10
 b) Draw and explain functional pin diagram of 8085. 10
 c) Explain following 8085 microprocessor instructions. 10
 i) CALL ii) SHLD addr. iii) DAA
 iv) LDA addr v) PUSH B.

UNIT – V

5. a) Write an assembly language program for two's complement of 16 bit number. 10
 b) Write an assembly language program for addition of two 16 bit numbers whose is greater than 16 bit. 10
 c) Write an assembly language program for finding the maximum number from an array. 10
