

Seat  
No.

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BII1306

**Digital Systems & Microprocessor  
(New) (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. Answersheet 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. Draw the figure whenever necessary.
6. Figure to right indicates full marks.
7. Assume suitable data whenever necessary.

**UNIT - I**

1. a) Explain DTL NAND gate in detail. 10  
b) Implement special gates using NAND gate only. 10  
c) Simplify following using boolean theorems & implement simplified expression. 10
  - i)  $(A + C + D) \cdot (A + C + \bar{D}) \cdot (A + \bar{C} + D) \cdot (A + \bar{B})$
  - ii)  $(A + B)(\bar{A} + C) \cdot (B + C)$

**UNIT - II**

2. a) Explain full adder in detail. Also design full adder using two half adder & one OR gate. 10  
b) Solve following using  $k_{map}$  & implement it using universal gates only.
  - i)  $F(ABCD) = \sum_m (0, 2, 5, 7, 8, 10, 13, 15)$  5
  - ii)  $F(ABCD) = \pi_m (1, 3, 4, 6, 9, 11, 12, 14)$  5

c) Solve using  $k_{map}$ .

i)  $F(ABCDEF) = \sum_m (0, 5, 7, 8, 9, 12, 13, 23, 24, 25, 28, 29, 37, 40, 42, 44, 46, 55, 56, 57, 60, 61)$  **5**

ii)  $F(ABCDE) = \sum_m (0, 5, 6, 8, 9, 10, 11, 16, 20, 24, 25, 26, 27, 29, 31)$  **5**

### UNIT - III

3. a) Design a combinational logic circuit with 4 input lines that represents decimal digit in BCD & 4 output lines that generates 9's complement of input digit. **10**
- b) Explain 2bit comparator in detail. **10**
- c) Explain SR Flip Flop with suitable diagram. **10**

### UNIT - IV

4. a) Explain following terms of 8085. **10**
- i) READY.
- ii) DAA.
- iii)  $S_0 - S_1$
- iv)  $IO/\overline{M}$
- b) Explain following.
- i) Flag register of 8085. **6**
- ii) Instruction formats of 8085. **4**
- c) Explain rotational instructions of 8085 with suitable example. **10**

### UNIT - V

5. a) Write on ALP for HEX to BCD conversion. **10**
- b) Explain following. **10**
- i) Comparison of assembly language & high level language.
- ii) Role of Assembler.
- c) Write on ALP for addition of first 10 HEX number. **10**

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