B.E. Computer Science & Engineering Sem-IV Old (CBS)

CS402 - Digital Circuits and Fundamentals of Microprocessor

P. Pages : 2 **GUG/S/19/1540**

Time : Three Hours *1199* Max. Marks : 80

Notes :
1. All questions carry marks. as indicated
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Perform the following. **8**

a) $(376)_8 = (?)_{16}$

b) $(1011110)_{Gray} = (?)_B$

c) $(36)_D - (49)_D$ using 2's complement method.

d) $(AF16)_{16}$ to binary and octal.

b) Expand $A + B\overline{C} + AB\overline{D} + ABCD$ to minterms and simplify using k - map. **8**

OR

2. a) Prove the following identities using Boolean theorems also implement with the proper hardware. **8**

i) $A + BC = (A + B).(A + C)$

ii) $\overline{A}B + A\overline{B} + \overline{A}\,\overline{B} + AB = 1$

b) Simplify using k - map **8**

f (A, B, C, D) = $\Sigma m(0, 3, 7, 8, 10, 11, 14) + d(2, 4)$

f (w, x, y, z) = $\Pi M(1, 2, 4, 5, 6, 8) \cdot d(0, 11)$

3. a) Implement the following logic function using 8:1 MUX **8**

f (A, B, C, D) = $\Sigma m(0,1,3,5,6,9,11,14)$

b) Explain 3 :8 decoder. Draw its logical circuit and also implement the function $f = \Sigma m(0, 2, 3, 7)$. **8**

OR

4. a) Design BCD to Excess - 3 code converter. **8**

b) What is Full subtractor. Design full subtractor using suitable logic gates. **8**

5. a) Draw the logic diagram of JK flip flop using NAND, gates and explain its working. **8**

b) What is race around condition of flip flop. How will you overcame from this condition? Explain. **8**

OR

6. a) Design a mod - 5 counter to avoid lock out condition using JK flip flop. **8**

b) Compare **4**
i) Asynchronous counter &
ii) Synchronous counter

c) Explain T - flip flop with its excitation table. **4**

7. a) Explain the addressing modes of μp 8085 with example. **8**

b) Draw and explain the timing diagram of MOV A, M. **8**

OR

8. a) Write an assembly language program to find the largest number among five members. **8**

b) Draw and explain schematic structure of μp 8085 interrupt. **8**

9. a) Differentiate between I/O mapped I/O port and memory mapped I/O port. Interface Ic 8255 in I/O mapped I/O **8**

b) Explain BSR and Input output mode of 8255 PPI. **8**

OR

10. a) Write an assembly language program to blink an LED using 8255 PPI. The address of port B is 92 H. **8**

b) Explain mode 0 of 8253 PIT. **8**

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