Total No. of Questions – 8] [Total No. of Printed Pages – 2

BE-IV/6(A)

214605

COMPUTER ENGINEERING **COURSE NO. COM – 401**

(Digital Electronics)

Time Allowed – 3 Hours *Maximum Marks - 100*

Note: Attempt ***five*** questions in all selecting at least two questions from each Section. Each question carries ***20*** marks.

Section – A

1. (a) Convert the following numbers as indicated:

   (i) $(0.12)_{10}$ into hexadecimal

   (ii) $(7325)_8$ into binary

   (iii) $(2004)_{10}$ into octal

   (iv) $(359.23)_{10}$ into binary

   (v) $(10110.0101)_2$ into decimal. (2 x 5)

   (b) (i) Perform decimal addition in 8-4-2-1 BCD: 589 + 199

   (ii) Reduce $\sum m(1,3,7,11,15) + \sum d(0,2,5)$ and implement using gates. (10)

2. (a) Simplify $AB + \overline{AC} + A\bar{B}C\,(AB+C)$ and $A+B(C+\overline{DE})$

   (b) Simplify using Quine-McCluskey Method

   $F(A,B,C,D) = \sum m(0,1,2,3,4,6,8,9,10,11)$. (8, 12)

3. (a) Discuss the operation of full adder and full subtractor.

   (b) Design a BCD to Excess – 3 code converter using minimum number of NAND gates. (10, 10)

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4. (a) Draw and explain BCD adder circuit with truth table.
   (b) Design 2-bit comparator using gates. (10, 10)

Section – B

5. (a) Implement the function using 4-to-16 line decoder IC

$$F(A,B,C,D) = \bar{C}\bar{D}+B\bar{C}\bar{D} + B\bar{C}\bar{D} + A\bar{B}\bar{C}\bar{D}$$ (10)

   (b) Implement the following Boolean function with 8 : 1 multiplexer

$$F(A,B,C,D) = \pi M(0,3,5,8,9,10,12,14)$$ (10)

6. (a) Give the comparison between PROM,PLA and PAL. Also implement the following Boolean function using PLA

$$F1(A,B,C)=\sum m(0,1,3,5)\ F2(A,B,C) = \sum M(0,3,5,7)$$

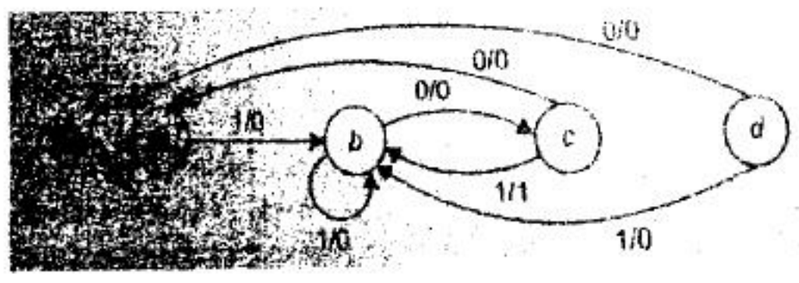
   (b) Write short note on Master Slave flip – flop. (12, 8)

7. (a) Design a modulo 8 binary counter. Draw the state diagram of the modulo 8 binary counter using J-K flip flop

   (b) Convert D Flip – Flop to J-K Flip-Flop. (12, 8)

8. (a) Explain the working of a Bidirectional shift register.

   (b) Design a clocked sequential machine using J-K Flip-Flop for the state diagram shown in figure. Use state reduction if possible. Make proper state assignment. (6, 14)



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