BACHELOR OF TECHNOLOGY (C.B.C.S.) (2021-COURSE)
B. Tech. Sem - I :SUMMER- 2022
SUBJECT : DIGITAL ELECTRONICS

Day : Wednesday

Date : 20-07-2022

S-24007-2022

Time : 10:00 AM-01:00 PM

Max. Marks : 60

N.B.:

    1)   All questions are **COMPUSLORY.**

    2)   Figures to the right indicate **FULL** marks.

    3)   Assume suitable data **WHEREVER** necessary.

    4)   Draw neat labeled diagrams **WHEREVER** necessary.

Q.1	Perform following conversions:	**(10)**
a)	$(214.56)_{10} = (\qquad)_2$	
b)	$(BD6)_{16} = (\qquad)_{10}$	
c)	$(123.54)_8 = (\qquad)_2$	
d)	$(4EA)_{16} = (\qquad)_8$	
e)	$(10110101.1010)_2 = (\qquad)_{10}$	

OR

Q.1	Why NAND and NOR gates are called universal gates? Realize all logic gates using **only NAND** gates.	**(10)**
Q.2	State and explain De-Morgan's theorem. Prove that	**(10)**
a)	$A + \overline{A} B = A + B$	
b)	$(A + B)(A + C) = A + BC$	

OR

Q.2	Simplify the following SOP expression using K-map and realize using logic gates. $F(A,B,C,D) = \sum m(1,3,4,5,7,9,13,15) + d(6,11)$	**(10)**
Q.3	Describe working of Multiplexer. Design 8:1 Multiplexer using Two 4:1 Multiplexers.	**(10)**

OR

Q.3	Design and implement BCD to Gray code converter using logic gates. State applications of Gray code.	**(10)**
Q.4	Describe different modes of operation of Shift register and state applications of Shift register.	**(10)**

OR

Q.4	Design 3 bit up-down counter with neat circuit diagram and timing diagram.	**(10)**
Q.5	Compare Moore and Mealy Models with suitable examples. Write state table and state equation for clocked D flip flop.	**(10)**

OR

Q.5	Describe basic elements of ASM chart. Draw ASM chart and state table for synchronous circuit with control input X, clock and outputs A, B. If $X = 1$, with every clock pulse outputs BA changes from $00 \rightarrow 01 \rightarrow 10 \rightarrow 11 \rightarrow 00$. If X=0, circuit holds present state.	**(10)**
Q.6	Describe PLA with neat block diagram. Implement following functions using PLA with 3 inputs, 3 product terms and two outputs. $F_1(a,b,c) \sum m(4,5,7)$ $F_2(a,b,c) = \sum m(1,5,7)$	**(10)**

OR

Q.6	Describe different types of semiconductor memories and state their applications.	**(10)**

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