

Priyadarshini College of Engineering, Nagpur
Sessional Examination (2023-24) Odd Semester
B.Tech. Third Semester (Information Technology) (C.B.C.S.)
Digital Electronics and Fundamental of Microprocessor

P. Pages: 2

PCE/KW/23/BEIT303T/SET-A

Time: Three Hours

Max. Marks: 70

Notes:

1. All questions carry marks as indicated.
2. Solve Question 1 or Question 2.
3. Solve Question 3 or Question 4.
4. Solve Question 5 or Question 6.
5. Solve Question 7 or Question 8.
6. Solve Question 9 or Question 10.
7. Due credit will be given to neatness and adequate dimensions.
8. Assume suitable data wherever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

Q. No.	Question	CO	BT	Marks
1. a)	Explain and prove the De-Morgan's Theorem.	CO1	L2	6
b)	Convert the following	CO1	L3	8
	i) $(675.625)_{10} = ()_{16}$			
	ii) $(7BF3)_{16} = (?)_2$			
	iii) $(1111)_2 = (?)_{10}$			
	iv) $(ABCD.EF)_{16} = (?)_8$			
OR				
2. a)	Simplify the following	CO1	L3	6
	1) $AB + \overline{AC} + BC = AB + \overline{AC}$			
	2) $AB + A\overline{BC} + B\overline{C} = AC + \overline{BC}$			
b)	Draw symbol of AND, NOR, ExOR & NAND gates and write their truth tables.	CO1	L1	8
3. a)	Simplify the given function using k-map and realize using NAND gates. $f(A,B,C,D,E) = \sum m(0,5,6,8,9,10,11,16,20,24,25,26,27,29,31)$	CO2	L3	7
b)	Minimize the following function using K-map	CO2	L3	7
	i) $f(A,B,C,D) = \sum m(0, 1, 4, 5, 6, 8, 9, 12) + d(13, 14)$			
	ii) $f(A,B,C,D) = \sum m(3, 4, 6) + d(1, 2, 5)$			
OR				
4. a)	Solve the following logic function using K-map and realize using only NOR gates. $f(A,B,C,D) = \prod M(1, 4, 6, 9, 10, 11, 14, 15)$	CO2	L3	7
b)	Solve the given function using k-map and implement using logic gates. $f(A,B,C,D) = \sum m(0, 1, 4, 5, 6, 8, 9, 12) + d(13, 14)$	CO2	L3	7

PCE/KW/23/SET-A

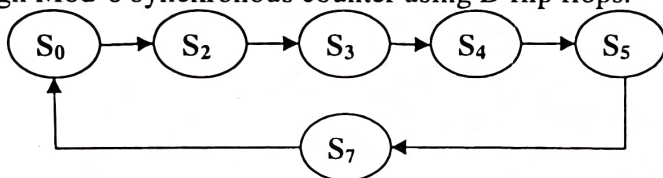
Q. No.	Question	CO	BT	Marks
5. a)	Design 3 bit binary to gray code converter.	CO3	L3	8
b)	Implement the following function using 8:1 MUX select A, B, C as select lines $F(A,B, C, D) = \sum m(0, 2, 3, 5, 7, 9, 11, 14, 15)$	CO3	L3	6

OR

6. a)	Design full adder circuit using two half adders and one OR gate. Draw the logic circuit and give its truth table.	CO3	L3	8
b)	Design a 4-line to 2-line priority encoder with D3 as has the highest priority.	CO3	L3	6
7. a)	Convert the following Flip-Flop : i) S-R to J-K Flip-flop ii) J-K flip flop to T flip-flop	CO4	L3	8
b)	Explain the working of JK flip flop. What is race around condition and how it is eliminated?	CO4	L2	6

OR

8. a)	Design Mod-6 synchronous counter using D flip flops.	CO4	L3	8
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b)	Design and explain the 3-bit Ripple counter with waveforms.	CO4	L3	6
9. a)	Draw & explain the interrupt structure of 8085 microprocessor in details.	CO5	L2	8
b)	Explain addressing modes of 8085 microprocessor with one example each.	CO5	L2	6

OR

10. a)	Draw and explain the architecture of 8085 microprocessor.	CO5	L2	8
b)	Explain the functions of following pins in 8085 microprocessor. i) READY ii) SOD iii) IO/M(bar)	CO5	L2	6
