Q.P. Code: 16EC402 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations November-2020

SWITCHING THEORY AND LOGIC DESIGN

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	Convert the following numbers. i) $(6153.7406)_8$ to binary. ii) Convert $(A3C2.D)_{16}$ to binary and then to Octal. iii) $(1032.2)_6$ to decimal.	**6M**
	b	i) Convert gray code 1010011011 into its binary equivalent. ii) Use 2's complement to perform M - N with the given number M=101010100 N=100000100.	**6M**

OR

2	**a**	Express the function Y=A+B'C in canonical SOP form.	**4M**
	b	Prove the following using Boolean algebra i) y'z' + w'x'z' + w'xyz' + wyz' = z' ii) ABC + A'B'C + A'BC +ABC' + A'B'C' = A'B' + B(A + C)	**8M**

UNIT-II

3	**a**	Simplify the Boolean function using K-map i) $F(W,X,Y,Z) = \Sigma_m(4, 5, 7, 12, 13, 14) + \Sigma_d(1, 9, 11, 15)$ ii) F (W, X, Y, Z) = W'X'Y'Z' + WXY'Z' + W'X'YZ + WXYZ	**8M**
	b	Explain about EX-OR gate functions.	**4M**

OR

4	**a**	Simplify the Boolean function by using tabulation method F(A,B,C,D)=Σm(0,1,2,5,6,7,8,9,10,14)	**8M**
	b	Implement the AND and OR gates by using NAND gates only.	**4M**

UNIT-III

5	**a**	Design and Implement Half adder and Full Adder with truth tables.	**6M**
	b	Draw and explain the operation of 2×2 binary multiplier.	**6M**

OR

6	**a**	Implement the following Boolean function using 4:1 Multiplexer F(A,B,C,D)=∑m(0,1,2,4,6,9,12,14).	**6M**
	b	Design and Implement 3 to 8 Decoder with its truth table.	**6M**

UNIT-IV

7	**a**	Convert SR Flip-Flop to JK Flip-Flop.	**6M**
	b	Implement 4-bit ring counter using suitable shift register. Briefly describe its operation.	**6M**

OR

8	**a**	Explain and design asynchronous MOD10 counter using T-Flip-flops.	**6M**
	b	What is a shift register? Explain about the following modes of operation in a four bit shift register. (i) Shift right (ii) Shift left and (iii) bidirectional.	**6M**

UNIT-V

9	**a**	Implement the following Boolean function using PLA. $F1(w,x,y,z) = \Sigma m(0,1,3,5,9,13)$ $F2(w,x,y,z)) = \Sigma m(0,2,4,5,7,9,11,15)$	**6M**
	b	Explain the following related to sequential circuits. i) State diagram ii) State table iii) State assignment	**6M**

OR

10	**a**	Implement the following Boolean function using PAL. $A(w,x,y,z) = \Sigma m(0,2,6,7,8,9,12,13)$ $B(w,x,y,z) = \Sigma m(0,2,6,7,8,9,12,13,14)$ $C(w,x,y,z) = \Sigma m(1,3,4,6,10,12,13)$ $D(w,x,y,z) = \Sigma m(1,3,4,6,9,12,14)$	**8M**
	b	What is ROM. Explain about Different types of ROMs briefly?	**4M**

*** END ***