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

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Nov/Dec 2019

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 given decimal number 234 to binary, octal, hexadecimal and BCD equivalent.	**6M**
	b	Simplify the following Boolean expressions using the Boolean theorems i) (A+B+C) (B'+C) (A'+C) ii) ii) (A+B) (A+B') (A'+B)	**6M**

OR

2	**a**	Solve for x i) $(257)_8 = (x)_2$ ii) $(BC2)_{16} = (x)_8$ iii) $(33)_{10} = (201)_x$	**6M**
	b	Express the decimal digits 0-9 in BCD, 2421 and Excess-3 codes.	**6M**

UNIT-II

3	**a**	Simplify the given Boolean function using map method. F(A,B,C,D,E) = Σm(0,2,4,6,9,13,21,23,25,29,31).	**8M**
	b	Implement the AND and OR gates by using NOR gates only.	**4M**

OR

4	**a**	Simplify the Boolean function by using tabulation method. F(A,B,C,D)=Σm(1,3,5,8,9,11,15).	**8M**
	b	Simplify the given Boolean function using map method. F(x, y, z) = Σm (0,1,2,3,7).	**4M**

UNIT-III

5	**a**	Design and Implement Half subtractor and Full subtractor with truth tables.	**6M**
	b	Draw and explain the operation of three bit magnitude comparator.	**6M**

OR

6	**a**	What is encoder? Design octal to binary encoder.	**6M**
	b	Design a 16 line to 1 line multiplexer using 4 line to 1 line multiplexer.	**6M**

UNIT-IV

7	**a**	Explain and design the 4-Bit Asynchronous Ripple down counter.	**8M**
	b	Write the differences between combinational and sequential circuits.	**4M**

OR

8	**a**	What is race around problem in JK Flip-Flop? Explain how it is eliminated in master slave JK Flop-Flop.	**6M**
	b	Show that how ring counter acts as a Johnson counter.	**6M**

UNIT-V

9 **a** Implement the following three Boolean functions with a PLA: **6M**

$F1(A,B,C)=\sum(0,1,2,4)$;
$F2(A,B,C)=\sum(0,5,6,7)$;
$F3=\sum(0,3,5,7)$.

b Design a combinational circuit using a ROM. The circuit accepts a three-bit number and outputs a binary number equal to the square of the input number. **6M**

OR

10 **a** Implement the following Boolean function using PAL with AND-OR structure **8M**

$F1(A,B,C,D)=\sum m(2,12,13)$;
$F2(A,B,C,D)=\sum m(7,8,9,10,11,12,13,14,15)$
$F3(A,B,C,D)=\sum m(0,2,3,4,5,6,7,8,10,11,15)$;
$F4(A,B,C,D)=\sum m(1,2,8,12,13)$.

b Explain about Mealy and Moore models of sequential circuits. **4M**

*** END ***