

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular & Supplementary Examinations August-2023

DIGITAL LOGIC DESIGN
(Common to CAD & CSIT)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Convert the following:

CO1 L6 12M

- i) $(1AD)_{16} = ()_{10}$
- ii) $(453)_8 = ()_{10}$
- iii) $(10110011)_2 = ()_{10}$
- iv) $(5436)_{10} = ()_{16}$

OR

2 a Reduce the following Boolean Expressions:

CO1 L6 4M

$A'C' + ABC + AC' + AB$ to three literals.

b $(X'Y' + Z)' + Z + XY + WZ$ to three literals.

CO1 L6 4M

c $A'B(D' + C'D) + B(A + A'CD)$ to one literal.

CO1 L6 4M

UNIT-II

3 Simplify the Boolean expression using K-MAP and draw the AOI logic diagram. $F(A, B, C, D, E) = \sum m(0, 2, 4, 6, 9, 13, 21, 23, 25, 27, 29, 31)$

CO1 L6 12M

OR

4 a Why NAND and NOR gates are called Universal gates? And Implement $F = AB + CD$ using two level implementation.

CO1 L6 6M

b Implement the function $F = X'Y + X'Y' + Z$ using two level NAND implementation.

CO1 L6 6M

UNIT-III

5 a Explain about Binary Half Adder with truth table and logic diagram.

CO2 L2 6M

b Design and draw a full adder circuit.

CO5 L3 6M

OR

6 a What is a Decoder? List its advantages.

CO1 L1 6M

b Implement Full Adder using a Decoder and an OR gate.

CO5 L5 6M

UNIT-IV

7 a Explain the analysis procedure of sequential circuits.

CO4 L2 4M

b What is race-around condition? How race around condition is eliminated in a Master-slave J-K flip-flop?

CO5 L2 8M

OR

8 a Explain in detail about Ring counter and list its applications.

CO3 L2 6M

b Explain in detail about Johnson counter and list its applications.

CO3 L2 6M

UNIT-V

9 a Compare RAM and ROM.

CO4 L2 6M

b List different types of ROMs.

CO2 L1 6M

OR

10 Design and implement the following functions using PLA.

CO6 L6 12M

$A(x, y, z) = \sum m(1, 2, 4, 6)$, $B(x, y, z) = \sum m(0, 1, 6, 7)$, $C(x, y, z) = \sum m(2, 6)$.

*** END ***

