O.P.Code: 23EC0403	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year I Semester Regular Examinations February-2025

DIGITAL CIRCUITS DESIGN

(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Write the truth table for F=(A+B)(C+D).	CO1	L2	2M
	b	List out the types of number systems with one example for each.	CO1	L2	2M
	c	Define a Combinational Circuit and draw its block diagram.	CO4	L1	2M
	d	List the applications of encoder and decoder.	CO4	L1	2M
	e	Explain about the module representation of logic circuits in Verilog.	CO6	L1	2M
	f	Differentiate between Verilog and VHDL.	CO6	L4	2M
	g	What is sequential circuit?	CO4	L1	2M
	h	Difference between Latch and Flip-flop.	CO4	L4	2M
	i	State the types of ROM.	CO5	L1	2M
	j	List the major differences between PLA and PAL.	CO5	L1	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Convert the following numbers: i) $(AB)_{16}=(\ )_2$ ii) $(1234)_8=(\ )_{16}$	CO1	L1	5M
	b	Explain about the Binary Codes in detail.	CO1	L2	5M
		OR			
3	a	Simplify the expression in S O P form using don't cares. $Y= \Sigma (4,5,6,8,9) + d \Sigma (3, 7, 10,11,14,15)$	CO2	L4	5M
	b	State and prove the following Boolean laws: i) Commutative ii) Associative	CO2	L3	5M

UNIT-II

4	a	Design & implement Half Adder and Half subtractor logic circuit using truth table.	CO4	L3	5M
	b	Explain the working of a Carry- Look ahead adder.	CO4	L2	5M
		OR			
5	a	Define Demultiplexer? Design an 1:8 demultiplexer using two 1:4 demultiplexer.	CO4	L3	5M
	b	Draw the circuit for 3 to 8 decoder and explain.	CO4	L2	5M

UNIT-III

6		Explain about the Hierarchial Verilog code with an example.	CO6	L1	10M
		OR			
7	a	Write an Verilog code for Half Adder and Full Subtractor with the help of Truth tables.	CO6	L1	5M
	b	State the importance of CAD Tools in HDL.	CO6	L1	5M

UNIT-IV

8	a	Design T Flip Flop using JK Flip-Flop and explain its logic diagram.	CO4	L3	5M
	b	Explain the working principle of RS Flip-Flop with the help of logic Diagram and give its Characteristic Table and Graphic symbol.	CO4	L2	5M
		OR			
9		Define a Shift register and explain its types.	CO4	L2	10M

UNIT-V

10		Explain and Design a Sequence Detector.	CO2	L2	10M
		OR			
11		Illustrate the PAL for the following Boolean functions. (i) $A(w,x,y,z) = \Sigma m(0,2,6,7,8,9,12,13)$ (ii) $B(w,x,y,z)) = \Sigma m(0,2,6,7,8,9,12,13,14)$	CO5	L3	10M

*** END ***

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