O.P.Code: 23CS0506 | **R23** | **H.T.No.** ☐☐☐☐☐☐☐☐☐☐

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech.II Year I Semester Regular Examinations February-2025
DIGITAL LOGIC AND COMPUTER ORGANIZATION
(Common to CSIT, CSE, CIC & CCC)

Time: 3 Hours   Max. Marks: 70

PART-A
(Answer all the Questions 10 x 2 = 20 Marks)

1	a	List the names of universal gates with symbols.	CO1	L2	2M
	b	Simplifiy the given Boolean function $F = AB + \bar{B}C + AC$	CO1	L1	2M
	c	List the types of Buses.	CO2	L2	2M
	d	Expalin about race-around condition.	CO2	L2	2M
	e	What is the need of multiple organization?	CO3	L1	2M
	f	Represent -9 in signed magnitude, 1s complement and 2s complement.	CO3	L2	2M
	g	What is the need of memory?	CO6	L1	2M
	h	What is cache memory?	CO4	L2	2M
	i	What is interrupt and classify?	CO5	L1	2M
	j	What is the need of buses and classify the bus structure?	CO6	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Simplify the following Boolean expression: F = (A+B)(A'+C)(B+C).	CO1	L1	5M
	b	Implement the following Boolean function using 8:1 multiplexer. F(A,B,C,D) = A'BD'+ACD+B'CD+A'C'D.	CO1	L2	5M

OR

3	a	Simplify the given Boolean expression $F = ABC + \bar{A}\bar{B}C + A\bar{B} + ABC + \bar{A}\bar{B}C$	CO1	L3	5M
	b	Design & implement Full Adder using Two Half adder and OR gate.	CO1	L4	5M

UNIT-II

4	a	Draw the circuit of JK flip flop using NAND gates and explain its operation.	CO2	L3	5M
	b	Explain briefly about the performance of a computer.	CO2	L2	5M

OR

5	a	Design a BCD ripple counter.	CO3	L4	5M
	b	Give the Structure of BUS Interface with various devices in computer.	CO2	L3	5M

UNIT-III

6	a	Explain the working of a Ripple carry adder	CO1	L2	5M
	b	Illustrate the steps in Booth multiplication flow chart. Show the step by step signed multiplication of (-7) and (-11) using Booth algorithm.	CO1	L3	5M

OR

7	a	Subtract 1111 and -1011 using 2's complement subtractions.	CO1	L5	6M
	b	Explain the fundamental concept in processor organization.	CO3	L3	4M

UNIT-IV

8	a	Categorize the semiconductor RAM in detail.	CO5	L4	6M
	b	Compare the various cache mapping techniques.	CO5	L2	4M

OR

9	a	Discuss the speed, size and cost of a memory.	CO5	L2	5M
	b	Compare various types of secondary storage systems.	CO5	L2	5M

UNIT-V

10	a	Explain how to access input and output devices in detail.	CO6	L2	5M
	b	Give detailed notes on DMA transfers with neat sketch.	CO6	L2	5M

OR

11	a	Explain the interrupt Nesting.	CO6	L2	5M
	b	Explain about SCSI BUS in detail.	CO6	L2	5M

*** END ***