

Code: 23ES1304

II B.Tech - I Semester – Regular Examinations - DECEMBER 2024**DIGITAL LOGIC AND COMPUTER ORGANIZATION**
(Common for CSE, IT)

Duration: 3 hours

Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

BL – Blooms Level

CO – Course Outcome

PART – A

		BL	CO
1.a)	Define self-complementing code.	L1	CO1
1.b)	Determine sum of BCD addition of 49 and 55.	L2	CO1
1.c)	Construct full adder using two half adders.	L3	CO4
1.d)	Write the truth table of SR Flip-flop.	L2	CO1
1.e)	Compare register and memory stack.	L2	CO1
1.f)	Sketch flow chart of addition and subtraction with signed magnitude data.	L2	CO2
1.g)	Distinguish between SRAM and DRAM memories.	L2	CO1
1.h)	What is the page replacement algorithm? List out types.	L2	CO1
1.i)	Compare asynchronous and Synchronous data transfer.	L2	CO2
1.j)	What is DMA read operation?	L1	CO2

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Express the following function in sum of minterms and product of maxterms. $f = (x y + z) (y + x z)$.	L3	CO3	5 M
	b)	What is the importance of a Gray code? Convert the following binary codes into corresponding gray code i) 1010110101 ii) 01101101110	L2	CO1	5 M
OR					
3	a)	Reduce the following function using K-map and implement it using fundamental gates. $f(w, x, y, z) = \sum m(1, 3, 4, 5, 6, 9, 11, 12, 13, 14)$	L3	CO3	5 M
	b)	Prove that NAND and NOR operations are not associative.	L2	CO1	5 M
UNIT-II					
4	a)	Define decoder. What are its types? Explain 3X8 line decoder with its truth table and enable inputs.	L2	CO4	5 M
	b)	Expand 16x1 line multiplexer tree using 4X1 line multiplexers.	L4	CO4	5 M
OR					

5	a)	Design characteristic equation for JK flip-flop.	L2	CO4	5 M
	b)	Design mod-6 asynchronous counter using T-flip-flops. Draw timing diagram for continuous clock.	L3	CO4	5 M
UNIT-III					
6	a)	Compare among instruction formats of the general purpose computer.	L3	CO2	5 M
	b)	Design a single digit BCD adder logic using 4-bit binary adders and appropriate gates.	L3	CO2	5 M
OR					
7	a)	Explain Booths multiplication algorithm for signed two's complement numbers with numerical example.	L3	CO2	5 M
	b)	Convert the following arithmetic expressions from infix to reverse polish notation: i. $A*B+C*D+E*F$ ii. $A*[B+C*(D+E)]/F*(G+H)$	L3	CO2	5 M
UNIT-IV					
8	a)	What is RAM? Explain types of RAMs with suitable diagrams.	L2	CO1	5 M
	b)	What is virtual memory? Give its merits and demerits.	L2	CO1	5 M
OR					

9	a)	Analyze the memory hierarchy in terms of speed, size and cost.	L2	CO1	5 M
	b)	Explain set associative address mapping of cache memory.	L2	CO1	5 M
UNIT-V					
10	a)	Illustrate the daisy-chain priority interrupt mechanism for I/O data transfer.	L2	CO2	5 M
	b)	Explain source and destination initiated data transfer for handshaking.	L2	CO2	5 M
OR					
11	a)	Discuss working principle of DMA with a neat diagram.	L2	CO2	5 M
	b)	What is an interrupt? Explain interrupt cycle of computer.	L2	CO2	5 M