

[Total No. of Ques. 05]

Seat No:

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G II Raison College of Engineering and Management, Pune.
(An Autonomous Institution affiliated to Savitribai Phule, Pune University)

FY B.TECH (TERM I/SEM I)
ESE WINTER 2025 (2023Pattern)
Digital Logic Design (23UESL1105)

[Time:2.30Hours]

[Max. Marks: 60]

Instructions to the candidates:

- 1) All questions compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.
- 5) Other Instructions, if any.

Q. No.	Sub Question	Marks	CO	BL
1	a) Convert the following numbers i) $(1025)_8$ into Decimal () ₁₀ and () ₁₆ Hex ii) $(1FF)_{16}$ into () ₁₀ Decimal and () ₂ Binary	[6]	CO1	L2
	b) Simplify the following expression using Boolean algebra $Z=A[B+C(AB+AC)]$ and implement the simplified expression using logic gate.	[6]	CO1	L2
	OR			
	c) Perform the subtraction on following number using 1s Compliment technique 1] $(23)_{10} - (13)_{10}$ 2] $(15)_{10} - (25)_{10}$	[6]	CO1	L3
2	a) Simplify the following expression using K map and design the simplified expression using logic gate $F(ABCD)=\sum m(1,2,3,5,6,10,11,12,15)+d(0,7,8,9)$	[6]	CO2	L3
	b) Design the following expression using 4:1 mux $F(ABC)=\sum m(1,2,3,5,6,7,8)$	[6]	CO2	L3
	OR			
	c) Draw and explain 3 to 8 decoder with proper logic gate diagram and truth table	[6]	CO2	L2
3	a) What is Flipflop? How to Design T FF from JK FF? Also write the application of T FF.	[6]	CO3	L2
	b) Design 2 bit synchronous counter. Also draw its timing diagram and truth table.	[6]	CO3	L3
4	a) Describe FSM in details. Also compare Mealy and Moore FSM in details.	[6]	CO3	L2
	b) Draw the Mealy and Moore model to detect 1110 sequence.	[6]	CO3	L2
5	a) Draw the structure of VHDL programming. Write the VHDL program for NAND gate using Structural and Dataflow modeling.	[6]	CO4	L2
	b) Write the VHDL code for 4:1 Mux using behavioral modeling.	[6]	CO4	L2

- BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analyzing, 5 –Evaluating, 6 - Creating).