PRESIDENCY UNIVERSITY

BENGALURU

Make up Examinations –December 2025

Date: 29 –12-2025   **Time:** 09:30am – 12:30pm

School: SOE	**Program**: B Tech	
Course Code: ECE3008	**Course Name**: VLSI Design	
Semester: MK	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	26	28	22	24	

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.   **10Q x 2M=20M**

1.	With an example explain module declaration in Verilog .	2 Marks	L1	CO1
2.	Write the Drain current equation for Saturation region	2 Marks	L2	CO2
3.	Draw the structure of 6T SRAM cell	2 Marks	L2	CO4
4.	Draw the structure of the MOSFET and name its different Layers	2 Marks	L2	CO3
5.	What are the Verilog modelling styles? Name them.	2 Marks	L1	CO1
6.	What is etching in Fabrication?	2 Marks	L2	CO1
7.	Explain how latch up occurs in MOSFET?	2 Marks	L3	CO2
8.	What are the different types of MOSFETs?	2 Marks	L1	CO2
9.	Draw the Structure of a NMOS ROM cell	2 Marks	L2	CO4
10.	If the Vgs Vt = 0.2 V and Vds + 0.4, identify the region of operation and write the current equation	2 Marks	L3	CO2

Part B

Answer the Questions.   Total Marks 80M

11.	a.	MOSFET stands for Metal Oxide Semiconductor Field Effect Transistor With neat figure explain the NMOS fabrication steps	10 Marks	L2	CO1
	b.	Write the flow chart for VLSI design flow and explain in detail	10 Marks	L1	CO1
Or					
12.	a.	An application-specific integrated circuit is an integrated circuit (IC) chip customized for a particular use. What are the types of ASICs?	10 Marks	L1	CO1
	b.	Write a HDL program to implement a full adder using structural style and dataflow style.	10 Marks	L2	CO1

13.	a.	Explain with neat figure the working of NMOS transistor.	10 Marks	L2	CO2
	b.	Draw the graph of VDS vs ID and VGS vs ID for NMOS transistor and explain	10 Marks	L2	CO2
Or					
14.	a.	In an NMOS transistor determine the value of ID, and region of operation. What is the equation used to determine the drain current? Given : $MnCox\frac{W}{L}$ = 10Micrometer, VGS = 1V , Vt = 0.3V and VDS = 0.4 V .	10 Marks	L3	CO2
	b.	Define Noise Margin, Determine NML and NMH give VOH = 4V, VOL=0V, VIL = 0.7V, and VIH = 2.4V	10 Marks	L3	CO2

15.	a.	Implement a 2 Input NAND gate using CMOS technology and draw the stick diagram for the same	10 Marks	L3	CO3
	b.	Write the lamda based design rules for transistors, Contact cuts and different other layers	10 Marks	L2	CO3
Or					
16.	a.	Draw circuit of a CMOS Inverter and show its stick diagram.	10 Marks	L3	CO3
	b.	Show the design rules for transistors, contact cuts, diffusion layers	10 Marks	L3	CO3

17.	a.	With a neat figure and explain working of 3 T RAM	10 Marks	L3	CO4
	b.	Draw the figure of 1 T RAM and explain he read and write cycle	10 Marks	L3	CO4
Or					
18.	a.	Write a note on the Scaling. Scale any 3 parameters of your choice	10 Marks	L3	CO4
	b.	Classify semiconductor memories and draw the structure of a simple memory cell	10 Marks	L2	CO4