Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 09-10-2025 **Time:** 09.30am to 11.00am

School: SOCSE / SOE	**Program:** BTECH (CSE)	
Course Code : ECE2022	**Course Name:** DIGITAL DESIGN	
Semester: I	**Max Marks**:50	**Weightage**:25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Marks	**10**	**15**	**25**	**NA**	**NA**	**NA**

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. **5Q x 2M=10M**

1	Find the equivalent binary number representation of the given decimal number **16.125**?	**2 Marks**	**L2**	**CO1**
2	In the given Truth Table A,B & C are input literals(variables) and Y is output literal. In terms of input literals list out the Max terms:	**2 Marks**	**L2**	**CO1**
3	State Associative Law and Sketch the logic circuit using two input basic gate and Tabulate the Truth Table:	**2 Marks**	**L2**	**CO1**
4	Restructure the OR gate logic using NOR gate only:	**2 Marks**	**L2**	**CO1**
5	Predict SoP Equation for the given truth table:	**2 Marks**	**L2**	**CO1**

A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

A	B	Y

0	0	0	
0	1	1	
1	0	1	
1	1	0	

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	The given Standard Boolean function is, **F(W,X,Y,Z) =W'X'Y' +WY'Z'+ X'YZ'+ W'XZ +XY'Z.** i) Convert the function "F" into Canonical form. ii) Using K-map, Simplify into minimum SOP function.	**10 Marks**	**L2**	CO2
	b.	Determine the minimum SoP (using K Map) for the given Boolean function **F=Σ(m2, m3, m4, m6, m8, m9, m14, m15)** Also draw the logic circuit using NAND gate only:	**10 Marks**	**L3**	CO2, CO3
		Or			
7.	**a.**	**i)**Obtain the canonical form for the following standard function: **F=(A·B'·C') + (A·B·C·D) + (A'·B·C'·D) + (A'·B'··D)** **F = (B+C'+D')·(A'+B'+D)·(A+B'+C')** **ii)**Determine all the Selective Prime Implicants, for the Boolean function: **F(A,B,C,D)=Σm(1,2,3,4,5)**	**10 Marks**	**L2**	CO2
	b.	Determine the minimum SoP(using K Map) for the given Boolean function **F(A,B,C,D)=Σ(m0, m1, m4, m8, m9, m15)+ DC(6,14).** Also draw the logic circuit using NAND gate only:	**10 Marks**	**L3**	CO2, CO3

8.	**a.**	Predict Half Adder Truth Table, and Determine the Logic Circuit by using: i) Basic gates: ii) EXOR, and AND gates:	**15 Marks**	**L3**	CO3
	b.	Sketch the Full Adder circuit using minimum NAND gate:	**5 Marks**	**L2**	CO3
		Or			
9.	**a.**	Design a combinational circuit for Binary Addition of three 1-bit number (Full Adder) using minimum number of Two input ExOR gate, Two input AND gate or Two input OR gate:	**15 Marks**	**L3**	CO3
	b.	Sketch the Half Subtractor logic circuit using minimum NAND gates:	**5 Marks**	**L2**	CO3