PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025	
Date: 08-10-2025	**Time:** 02.00pm to 03.30pm

School: SOE	**Program:** Electronics and Communication Engineering
Course Code : ECE2021	**Course Name:** Digital Electronics
Semester: III	**Max Marks:** 50 **Weightage:** 25%

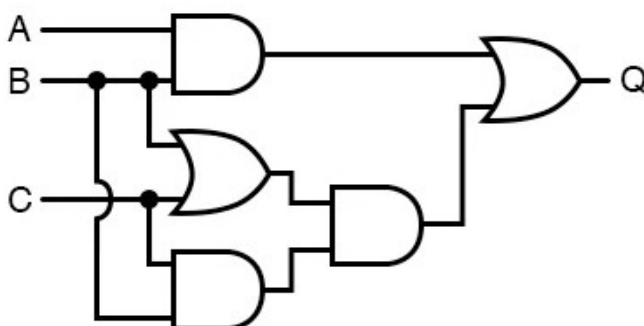| CO - Levels	CO1	CO2	CO3	CO4	CO5	CO6
Marks	**12**	**14**	**12**	-	-	**12**

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	Illustrate the 7th and 14th Minterm for the 4 bit resolution	2 Marks	L3	CO1
2	Implement the two input EX-NOR logic using NOR gate.	2 Marks	L3	CO2
3	Estimate the Boolean Function of the CARRY output for the Half adder circuit	2 Marks	L3	CO3
4	Identify the equivalent gray code for the decimal numbers 0,1,3,4,7	2 Marks	L2	CO2
5	Utilize the below Logic Diagram to drive the Truth Table.	2 Marks	L3	CO6

Part B

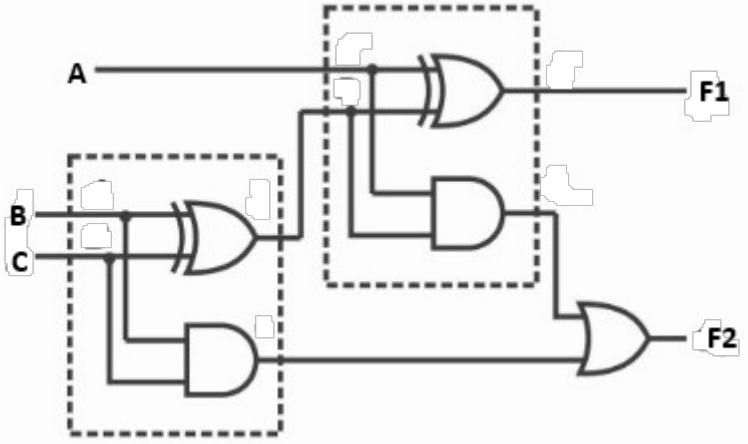| 6.	a.	Solve the following function as a sum of min-terms and as a product of max-terms with logic diagram
		
		   i. F(A, B, C, D) = B'D + A'D + BD
		   ii. Y = (CD + B'C + BD')(B + D)
		   iii. Z = BD' + ACD' + AB'C + A'C'
		   iv. **P = (C' + D)(B + C')**
			10 Marks	L3	CO1

		Or			
7.	a.	Employ the NAND gate for the following Boolean functions (a) F(w, x, y, z) = Σm (0, 2, 5, 7, 8, 10, 12, 13, 14, 15) (b) F(A, B, C, D) = Σm (0, 2, 3, 5, 7, 8, 10, 11, 14, 15)	10 Marks	L3	CO1

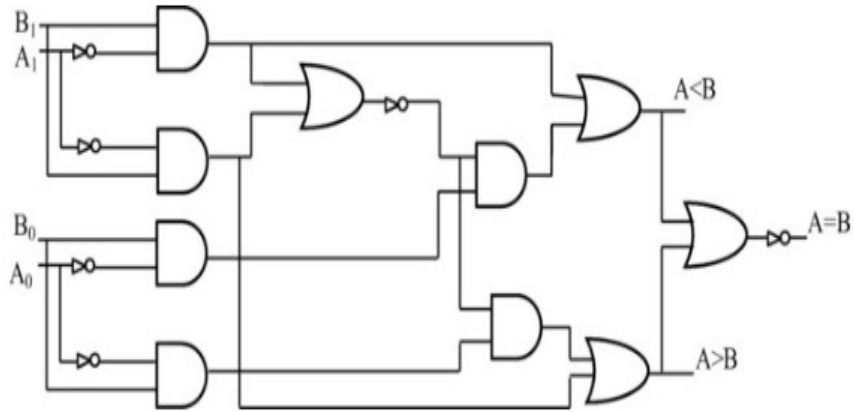| 8.	a.	Develop the optimized Boolean Function for the following
		
		   i. Y= Σm (1,2,3,7, 8,10,12,13,15)
		   ii. F = W'Z + XZ + X'Y + WX'Z
			10 Marks	L2	CO2

		Or			
9.	a.	Implement the following Boolean function F, together with the don't-care conditions d . (i) $F(W,X,Y,Z,) = \sum (0,1,2,7,9,11) + d = \sum (3,4,8)$ (ii) F(A,B,C) = A'C + A'B + AB'C + BC	10 Marks	L3	CO2

10.	a.	Examine the following logic diagram to identify the design statement 	10 Marks	L4	CO6
		Or			

11.	a.	Analysis the below circuit to prove that the digital circuit is a 2 bit comparator	10 Marks	L4	CO6

12.	a.	Apply the concept of truth table to draw the logic circuit diagram of a full adder using basic logic gates.	10 Marks	L3	CO3
		Or			
13.	a.	Develop the Logical Circuit which has a 3-bit digital system which rings a buzzer whenever the number of ones in an input combination is ODD.	10 Marks	L3	CO3