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PRESIDENCY UNIVERSITY

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Bengaluru

Mid Term Examinations - October 2026

Date: 09/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: CSC1505 **Course Name:** Digital Computer Fundamentals

Semester: First Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO4
Marks	52	8	120

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	A security system uses two switches, A and B, and the alarm should be activated only when both switches are ON. Identify the Boolean operation required and write its Boolean expression.	2	CO1	BT3
2	In a digital control system, an output should become 1 when exactly one of two inputs is 1. The designer decides to use an XOR gate. State the Boolean expression for the XOR operation and explain its condition for producing 1.	2	CO1	BT3
3	A student simplifies the Boolean expression A+ABA+AB while designing a digital circuit. Using Boolean algebra, apply the appropriate law and determine the simplified expression.	2	CO1	BT3
4	A digital system must compare two 1-bit binary inputs and indicate whether the first input is greater than, equal to, or less than the second input. Identify the combinational circuit required and name its three outputs.	2	CO2	BT2
5	A control circuit has three inputs and one output. The designer lists all possible input combinations, determines the required output for each combination, and then groups the 1s to simplify the circuit. Identify the method used for simplifying the Boolean function and state its main purpose.	2	CO2	BT2

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Implement NOT, AND, OR, NOR gates using NAND gate.	10	CO4	BT3
7	Implement NOT, AND, OR and NAND gates using NOR gate.	10	CO4	BT3

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Elucidate on Half Adder and Half subtractor.	10	CO4	BT3
9	Portray about Full Subtractor.	10	CO4	BT3

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	Simplify the Boolean Expresion. a. (A+B+C) (A+B'+C) (A+B+C') b. (A+B) (A+B') (A+C)	10	CO1	BT3

11	Calculate SOP from the given expression: $F(A,B,C,D)=\Sigma m(4,5,6,7,12,13)+d(0,1,8,9)$	10	CO1	BT3

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	Implement 1 Bit Magnitude Comparator along with Block Diagram, Truth table, K Maps and Circuit diagram.	10	CO4	BT3
13	Portray about Full adder.	10	CO4	BT3