Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 07/10/2026 **Time:** 11:45 AM - 01:15 PM

Course Code: ECE2022 **Course Name:** Digital Design

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

CO - Levels	CO1	CO2	CO3	CO4
Marks	22	22	24	22

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Write two expressions of De Morgan's Law	2	CO1	BT1
2	Write different steps involved in designing combinational circuits	2	CO3	BT1
3	Design a half adder using EX-OR gate and basic gates	2	CO3	BT1
4	Define Magnitude comparator	2	CO4	BT1
5	Get the simplified wxpression for the following minterms using K Map $f=\Sigma m(0,1,4,5,7)$	2	CO2	BT1

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Explain all the logical gates with the help of truth table, schematic and mathematical expression.	10	CO1	BT2
7	Show that NAND is an universal gate	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Apply K-Map method of simplification to get the simplified expression for the following min terms and implement the simplified expression using basic gates $f=\Sigma m(0,3,5,6,9,12,13,15)+ \Sigma d(1,4,11)$	10	CO2	BT2

PTO (Please Turn Over)

9	Apply K-Map method of simplification to get the simplified expression for the following max terms and implement the simplified expression using basic gates f=πM(0,1,3,4,6,7,11,13,14)+πM(2,5,8)	10	CO2	BT2

PART D: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
10	What is full adder?with the help of truth table implement half adder and full adder using only NAND gates.	10	CO3	BT3
11	What is full subtractor? Implement half subtractor and full subtractor using basic gates.	10	CO3	BT3

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	What is comparator? Implement 1 bit comparator using basic gates and NAND gates along with truth table.	10	CO4	BT3
13	A digital system is designed to identify the month that has **30 days.** Each month is represented as a 4 bit number- For example, January is 0000, February is 0001 and so on. The output for the corresponding month having 30 days will go high, else low. Consider the excess combinations of inputs as don't care. Implement a combinational circuit for the above scinario using basic gates.	10	CO4	BT3