Graphic Era HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Mid Term (Odd) Semester Examination October 2024

Roll no.....

Name of the Course and semester: B.Tech (CSE) and 3rd Semester
Name of the Paper: *Logic Design & Computer Organization*
Paper Code: TCS308
Time: 1.5 hour Maximum Marks: 50

Note:
(i) Answer all the questions by choosing any one of the sub questions
(ii) Each question carries 10 marks.

Q1. (10 Marks)
a. Find the Prime implicants and essential prime implicants of function $F(A,B,C,D) = \sum m(0, 3,5\ 8,10,13)$ using Quine-Mc-Cluskey method. CO1

OR

b. Implement the following Boolean functions using NAND-NAND logic gates? CO1
(i) F = A B+B C+C'D
(ii) Z= A'B'+ AC+B'C'

Q2. (10 Marks)
a. Simplify the function $F(A,B,C,D) = \pi M(4,5,6,7,8,12)+d(0,1,2,3,9,11,14)$ CO2

OR

b. Simplify the function $F(W,X,Y,Z) = \sum m(0,1,3,5,7,9,11,13,15)+d(8,10,12,14)$ using K-map. CO2

Q3. (10 Marks)
a. Implement the following function with single 8 x 1 multiplexer where 'D' is a control input

$$F(A,B,C,D) = \sum(0,1,3,4,8,9,15)$$ CO2

OR

b. Implement full adder **SUM** expression using single 4x 1 multiplexer. CO2

Q4. (10 Marks)
a. Realize the following flip -flops: CO3
(i) D flip-flop to JK Flip-flop.
(ii) T flip-flop to D flip-flop.

OR

b. Draw the logic diagram of J K flip-flop and also discuss the functioning of it using characteristic table. CO3

Q5. (10 Marks)
a. Draw the logic diagram of 4 bit universal shift register and explain its working. CO3

OR

b. Design a 3 bit binary to gray code converter also draw its logic diagram. CO3