



Term Evaluation (Odd) Semester Examination September 2025

Roll no.

Name of the Course: B.Tech(CSE)
Semester: IIIrd
Name of the Paper: Logic Design & Computer Organization
Paper Code: TCS 308
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. Minimize the 5-variable function $F(A,B,C,D,E) = \sum m(1,3,7,11,15,16,17,19,23,27,31) + d = \sum m(2,6,10,14)$ using K-maps. (CO1)

OR

b. Design a 4 bit binary adder- subtractor. (CO1)

Q2. (10 Marks)
a. Realize the function $F(A,B,C) = AB + \bar{C}$ using NAND and NOR gates. (CO1)

OR

b. Design the Boolean expression $F(A,B,C) = \sum m(1,3,6,7)$ by using 4X1 MUX and 2X1 MUX. (CO1)

Q3. (10 Marks)
a. Implement 2bit X 2bit binary Multiplier. (CO1)

OR

b. Using a 3×8 decoder, implement the two functions: $F1(A,B,C) = \sum m(1,2,5,7)$ and $F2(A,B,C) = \sum m(0,3,4,6)$. (CO1)

Q4. (10 Marks)
a. Explain the difference between a) Latch and Flip flop b) combinational and sequential circuits. (CO2)

OR

b. Design a T flip-flop using a JK flip-flop. Derive the logic equation and draw the circuit diagram. (CO2)

Q5. (10 Marks)
a. Derive the characteristic equation and truth table of a D flip-flop. Show how it avoids the invalid state of an SR flip-flop. (CO2)

OR

b. Derive the characteristic equations of SR, JK, D, and T flip-flops from their truth tables. (CO2)