



End Term (Odd) Semester Examination November 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: 3 hour

Maximum Marks: 100

Note:

- (i) All the questions are compulsory.
- (ii) Answer any two sub questions from a, b and c in each main question.
- (iii) Total marks for each question is 20 (twenty).
- (iv) Each sub-question carries 10 marks.

Q1.

(2X10=20 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)
- b. Design a BCD adder. (CO1)
- c. Design the Boolean expression $F(A,B,C)=\sum m(1,3,6,7)$ by using 4X1 MUX and 2X1MUX. (CO1)

Q2.

(2X10=20 Marks)

- a. Determine the characteristics equation and excitation table of JK and SR Flipflop. (CO2)
- b. Draw and explain the circuit of 5 bit SISO. (CO3)
- c. Convert JK flip-flop into D flip-flop. (CO2)

Q3.

(2X10=20 Marks)

- a. Draw and explain the circuit of MOD12 asynchronous counter using T flip flop. (CO3)
- b. Analyze the sequential circuit whose excitation equations are shown below (assume two D flip-flops, Q_1 and Q_0):

$$D1=Q_0', D0=Q_1$$

- Derive the **state table** and **state diagram**.
- Verify by showing the sequence of outputs for clock pulses. (CO3)
- c. Design a synchronous counter (using T flip flop) for a count sequence of 1, 3, 6, 7, 1. (CO3)

Q4.

(2X10=20 Marks)

- a. Draw the flowchart of booth's algorithm. Perform following signed number multiplication operation:
-6 x4 (CO4)
- b. Explain Amdahl's Law and Little's Law with suitable examples. (CO4)
- c. Explain the difference between Von-Neumann and Non Von-Neumann architecture. (CO4)

Q5.

(2X10=20 Marks)

- a. Discuss the various Cache Mapping techniques. (CO5)
- b. Explain Flynn's taxonomy with suitable examples. (CO6)
- c. Describe memory hierarchy based on parameters like speed, size, complexity, and cost. (CO5)