Enrolment No. /Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.SC(IT)- INTEGRATED – SEMESTER III- EXAMINATION –WINTER-2024

Subject Code:1330504 Date: 28/11/2024

Subject Name: Digital Electronics

Time:10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	Convert (i) $(110101)_2$ to decimal number and (ii) $(673.124)_8$ to binary number	**03**
	(b)	(i) By using 10's complement subtract 72532 - 3250 (ii) By using 1's complement subtract 1010100-1000011	**04**
	(c)	Define binary logic. Explain Binary-Coded Decimal (BCD) code.	**07**
Q.2	**(a)**	State the DeMorgan's theorem and validate it by using truth table.	**03**
	(b)	Find the complement of the functions F_1 = x'yz' + x'y'z and F_2 = x (y'z'+yz) by taking their duals and complementing each literal.	**04**
	(c)	Prepare a truth table for F= x'y'z + x'yz+ xy' and implement it with the logic gates.	**07**
		OR	
	(c)	Simplify a Boolean function by using K-map F (x, y, z) = $\sum$ (0, 2, 4, 5, 6)	**07**
Q.3	**(a)**	Draw a block diagram of 4 to 1 line multiplexer and give functional table.	**03**
	(b)	Differentiate combinational logic circuit and sequential logic circuit.	**04**
	(c)	Design a half adder combinational circuit with diagram and truth table.	**07**
		OR	
Q.3	**(a)**	Draw the block diagram of full adder with two half adders and an OR gate	**03**
	(b)	Describe decoder combinational circuit briefly.	**04**
	(c)	Describe the Magnitude comparator.	**07**
Q.4	**(a)**	Explain synchronous clocked sequential circuit.	**03**
	(b)	Explain latches and flip- flop briefly.	**04**
	(c)	Describe SR flip flop with circuit diagram.	**07**
		OR	
Q.4	**(a)**	Explain excitation table.	**03**
	(b)	Describe concept of master slave Flip Flop.	**04**
	(c)	Describe D- Flip Flop with necessary circuits.	**07**
Q.5	**(a)**	Draw a block diagram and timing diagram of serial transfer from register A to register B.	**03**
	(b)	Explain serial in serial out shift register.	**04**
	(c)	Explain classification and characteristics of memories.	**07**

OR

Q.5	**(a)**	Explain Random Access Memory (RAM).	**03**
	(b)	Describe magnetic and optical storage.	**04**
	(c)	Describe 4-bit ripple counter with figures.	**07**
