Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2024

Subject Code:3131704 Date:16-07-2024

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Briefly explain any three types of number systems with suitable example.	**03**
	(b)	Convert 1) (0.513) decimal to octal and 2) (630.4) octal to decimal.	**04**
	(c)	Explain all different types of Digital Logic Gates with proper truth tables and diagrams.	**07**
Q.2	**(a)**	What is Boolean algebra? Explain in brief its various laws.	**03**
	(b)	Explain binary addition and binary subtraction with suitable example.	**04**
	(c)	What is combinational circuit? Explain half adder circuit with proper truth table, equations and circuit diagram.	**07**
		OR	
	(c)	With proper truth table, equations and truth table explain full adder circuit. Also justify that full adder can be implemented using two half adders.	**07**
Q.3	**(a)**	Briefly explain the concept of multiplexer (MUX).	**03**
	(b)	What is Sum of Product form of Boolean equation? Explain with example.	**04**
	(c)	Implement the following function with NAND gates $F(x,y,z) = \sum(0,6)$	**07**
		OR	
Q.3	**(a)**	Briefly explain the concept of Demultiplexer (De MUX).	**03**
	(b)	What is Product of Sum form of Boolean equation? Explain with example.	**04**
	(c)	Implement the following function with NOR gates $F(x,y,z) = \sum(0,6)$	**07**
Q.4	**(a)**	What is sequential circuit? Briefly explain it.	**03**
	(b)	Briefly explain decoder.	**04**
	(c)	With suitable diagram and truth table explain D Flip Flop.	**07**
		OR	
Q.4	**(a)**	What is register? Briefly explain it.	**03**
	(b)	Briefly explain encoder.	**04**
	(c)	With suitable diagram and truth table explain J-K Flip Flop.	**07**
Q.5	**(a)**	Explain the following terms. 1) Fan in 2) Fan out 3) Propagation Delay	**03**
	(b)	With suitable diagram explain shift register.	**04**
	(c)	Explain various types of memories in detail.	**07**
		OR	
Q.5	**(a)**	Explain the terms.1) Threshold Voltage 2) Noise Margin 3) Power dissipation	**03**
	(b)	With suitable diagram explain synchronous counter.	**04**
	(c)	With suitable diagram explain 3 states TTL gate.	**07**

****