GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–III (NEW) EXAMINATION – WINTER 2023

Subject Code:3131704   **Date:12-01-2024**
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)**	Explain binary, octal and hexadecimal number system with example.	**03**
	(b)	Briefly explain combinational circuit and sequential circuit.	**04**
	(c)	List out various logic gates and explain each with proper diagram and truth table.	**07**
Q.2	**(a)**	What is gray code? Explain in brief.	**03**
	(b)	Convert the following numbers to decimal numbers	**04**
		1) (1010.011)2 2) (630.4)8	
	(c)	Explain basic theorems and properties of Boolean Algebra.	**07**
		OR	
	(c)	Briefly explain Minterms and Maxterms with example.	**07**
Q.3	**(a)**	Explain De'Morgan's theorem.	**03**
	(b)	Convert the following numbers to assigned number system	**04**
		1) 153 to Octal 2) (0.6875) to Binary	
	(c)	Express the following Boolean function in the product of Maxterm form: F = xy +x'z	**07**
		OR	
Q.3	**(a)**	Explain the concept of Venn Diagram.	**03**
	(b)	Design a half adder circuit using proper equations and truth table.	**04**
	(c)	Simplify the Boolean function using K map.	**07**
		F(x,y,z) = ∑ (0,2,4,5,6)	
Q.4	**(a)**	Briefly explain Multiplexer.	**03**
	(b)	Explain NAND Gate as a universal gate.	**04**
	(c)	Explain J-K Flip Flop in detail.	**07**
		OR	
Q.4	**(a)**	Briefly explain De Multiplexer.	**03**
	(b)	Explain NOR Gate as a universal gate.	**04**
	(c)	Explain Master- Slave Flip Flop in detail.	**07**
Q.5	**(a)**	Explain the following terms	**03**
		1) Propagation Delay 2) Fan in 3) Fan out	
	(b)	Explain Register and Shift Register in detail.	**04**
	(c)	What is DTL circuit? Explain any one DTL circuit for logic gate.	**07**

Q.5 **(a)** Explain the following terms   **03**
        1) Threshold Voltage 2) Noise Margin 3)Power Dissipation
    (b) Explain types of memories in detail.   **04**
    (c) What is TTL circuit? Explain any one TTL circuit for logic gate.   **07**

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