Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – SUMMER 2025

Subject Code:3131704 Date:13-06-2025

Subject Name:Digital Electronics

Time:02:30 PM TO 05:00 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)**	Differentiate between Combinational and Sequential circuits with suitable example.	**03**
	(b)	Convert a. $(110101)_2$ to decimal b. $(247.36)_8$ to hex number	**04**
	(c)	Explain basic laws of Boolean Algebra with appropriate illustrations.	**07**
Q.2	**(a)**	Map the following SOP expression on a Karnaugh Map : A'B'C+A'BC'+ABC'+ABC	**03**
	(b)	State De' Morgan's Theorem and prove it using truth table.	**04**
	(c)	Minimize the following Boolean functions using the K map method. $F(A,B,C,D) = \sum (0,1,2,3,5,7, 8,9,11,14)$ $F(A,B,C,D) = \sum (0,1,2,5,8,9,10)$	**07**
		OR	
	(c)	Design a half adder and half subtractor circuit.	**07**
Q.3	**(a)**	Minimize the four variable logic function F(A,B,C,D)=ABC'D+A'BCD+A'B'C'+A'B'D'+AC'+AB'C+B'	**03**
	(b)	With the help suitable block diagram and truth table, explain n bit digital comparator.	**04**
	(c)	Design and explain BCD to excess 3 code converter.	**07**
		OR	
Q.3	**(a)**	Represent the decimal number 4096 in BCD, Excess- 3 code and octal code.	**03**
	(b)	Give comparison between TTL and CMOS logic Family.	**04**
	(c)	Draw and explain block diagram and truth table of 4:1 line multiplexer with strobe (enable) input. Realize the 4:1 line multiplexer using NAND gate.	**07**
Q.4	**(a)**	Explain clocked S-R Flipflop. State its limitations.	**03**
	(b)	Distinguish between UVEPROM and EEPROM.	**04**
	(c)	Draw and explain two input TTL NAND gate.	**07**
		OR	
Q.4	**(a)**	Differentiate between RAM and ROM.	**03**
	(b)	Define following characteristics of Digital ICs 1. Noise Immunity 2. Propagation Delay 3. Power Dissipation 4. Fan out	**04**

	(c)	Explain 3-bit synchronous counter using J-K flip flop.	**07**
Q.5	**(a)**	Write short note on gray code.	**03**
	(b)	Explain J-K flip flop converted to T-type flip flop with necessary diagram and truth table.	**04**
	(c)	Explain various types of computer system microoperations.	**07**

OR

Q.5	**(a)**	Write a brief note on 'Ripple counter'.	**03**
	(b)	Draw and explain 3 to 8 line decoder.	**04**
	(c)	Enlist any two primary uses of shift registers. Draw and explain 4-bit bidirectional shift register.	**07**

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