Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV EXAMINATION – SUMMER 2020

Subject Code: 2140910 Date:04/11/2020

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 $(53.625)_{10}$ into an equivalent binary number.	**03**
	(b)	Compare 1's complement and 2's complement methods. Calculate 28 -19 using 2's complement method.	**04**
	(c)	State and prove DeMorgan's theorems with necessary figures and truth tables.	**07**
Q.2	**(a)**	Prove that a positive-logic AND gate is a negative-logic OR gate.	**03**
	(b)	Explain the characteristics of digital logic families.	**04**
	(c)	Simplify the following Boolean expressions using K-maps: (i) f = Σm(1,3,5,8,9,11,15),+,d(2,13) (ii) F = ΠM(1,2,3,8,9,10,11,14)·d(7,15)	**07**
		OR	
	(c)	Simplify the following Boolean expressions using Quine-McKluskey method: f = $\bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}D + \bar{A}BCD + ABCD + AB\bar{C}D$	**07**
Q.3	**(a)**	Perform BCD addition of 91 and 81	**03**
	(b)	Compare combinational and sequential logic circuits	**04**
	(c)	Write a short note on Gray code	**07**
		OR	
Q.3	**(a)**	Explain even and odd parity codes.	**03**
	(b)	Design and analyze the working of a 1-bit comparator using logic gates	**04**
	(c)	Describe the working of look ahead adder circuit.	**07**
Q.4	**(a)**	Explain the full adder circuit.	**03**
	(b)	Discuss the working of 3:8 decoder circuit.	**04**
	(c)	Describe the working of 4:1 multiplexer. State the advantages of multiplexers.	**07**

OR

Q.4	**(a)**	Differentiate between synchronous and asynchronous counters	**03**
	(b)	Explain the working of clocked RS flip-flop.	**04**
	(c)	Write a short note on applications of shift registers.	**07**
Q.5	**(a)**	Explain in brief universal shift register.	**03**
	(b)	Draw and explain the circuit of R-2R ladder.	**04**
	(c)	Write a short note on ring counter	**07**

OR

Q.5	**(a)**	State the advantage of a ripple counter	**03**
	(b)	Define the following terms of DAC:	**04**
		(i) Accuracy (ii) Resolution (iii) Linearity (iv) Settling time	
	(c)	Explain (i) Static RAM (ii) Dynamic RAM	**07**

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