Seat No.:_____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV (New) EXAMINATION – WINTER 2019

Subject Code: 2142406 Date: 13/12/2019

Subject Name: Digital Electronics and its applications

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.**

Q.1	**(a)**	Compute following in binary → $10 \times (1010)_2 = (\_\_\_\_\_)_2$	**03**
	(b)	Answer following with necessary computation. (1) (0011) Excess-3 = _____ (2) 1.1H = _____	**04**
	(c)	State logic families. Explain meaning of V_{IH}, V_{OH}, V_{IL} and V_{OL}. State these values for 5V CMOS logic.	**07**
Q.2	**(a)**	State universal gates. Draw implementation diagram of X= A+B function using universal gate.	**03**
	(b)	Simplify function F(x,y,z) = πM(3,7) using K Map.	**04**
	(c)	Realize expression using minimum NOR gates only. Y = AB' + AC' + C + AD + AB'C + ABC	**07**
		OR	
	(c)	Implement following using NAND gates only. Y = (P + Q + R)(P' + Q' + R')P	**07**
Q.3	**(a)**	Draw schematic diagram of 8:1 multiplexer circuit using two 4:1 multiplexer and necessary logic gates.	**03**
	(b)	Explain why combinational logic alone cannot be used for processor implementation.	**04**
	(c)	Design full subtractor circuit using decoder and required gates.	**07**
		OR	
Q.3	**(a)**	A and B are two 2-bit numbers. Draw schematic diagram for magnitude comparator using 4 to 16 decoder which use A and B as inputs. Write output equations for (1) A>B (2) A = B (3) A<B	**03**
	(b)	Draw schematic diagram of 4-bit binary parallel subtractor.	**04**
	(c)	Design a single digit BCD adder using 4-bit binary adders.	**07**
Q.4	**(a)**	What are the differences between latch and flip-flop?	**03**
	(b)	Define state and state diagram.	**04**
	(c)	Design synchronous 3-bit binary counter.	**07**
		OR	
Q.4	**(a)**	What is NOVA RAM?	**03**
	(b)	Compare SDRAM and DRAM.	**04**
	(c)	Design a circuit for 4-bit shift right register.	**07**
Q.5	**(a)**	Is it necessary to use WRITE signal with ROM in application circuits? Justify your answer.	**03**
	(b)	Define (1) Accumulator (2) ALU register	**04**
	(c)	What is micro program control of microprocessor? Explain the concept.	**07**
		OR	
Q.5	**(a)**	Construct D-flip flop using JK flip flop.	**03**
	(b)	Draw schematic of 2-bit ALU.	**04**
	(c)	Explain concept of PLA control of microprocessor.	**07**

****