Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2132003 Date: 07/06/2019

Subject Name:Design Concepts in Basic 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.**

			MARKS
Q.1	**(a)**	Comparison between 1's and 2's compliments.	**03**
	(b)	Explain with circuit diagram positive clamper and negative clamper.	**04**
	(c)	Draw and Explain the working of JK flip-flop.	**07**
Q.2	**(a)**	State and explain De-Morgan's theorems.	**03**
	(b)	Give the difference between Half wave and Full wave Rectifier.	**04**
	(c)	Show that NAND and NOR are universal gate.	**07**
		OR	
	(c)	Explain Digital Logic Gates with Symbol, Algebraic function and Truth Table.	**07**
Q.3	**(a)**	Design 3- bit up synchronous counter.	**03**
	(b)	Explain in detail bidirectional shift register with parallel load.	**04**
	(c)	Draw fixed-bias circuit and explain Collector-Emitter loop.	**07**
		OR	
Q.3	**(a)**	What is ripple counter?	**03**
	(b)	What is application of C.B configuration?	**04**
	(c)	Design a full wave Voltage Doubler Circuit with diodes.	**07**
Q.4	**(a)**	State the truth table of full-adder and half-adder.	**03**
	(b)	Implement the following function F using Multiplexer: $F(X, Y, Z) = X'Y + YZ + Y'Z'$	**04**
	(c)	Draw and Explain the working of clocked RS flip-flop	**07**
		OR	
Q.4	**(a)**	Define: (i) Extrinsic Semiconductor, (ii) DC Resistance of Diode , (iii) Barrier Potential	**03**
	(b)	Explain forward bias circuit.	**04**
	(c)	Compare in detail RTL, DTL, TTL, ECL and CMOS.	**07**
Q.5	**(a)**	What is energy band diagram?	**03**
	(b)	Draw the logic diagram and state truth table of 4x1 multiplexer.	**04**
	(c)	With the logic diagram explain the operation of 4-bit binary ripple counter.	**07**
		OR	
Q.5	**(a)**	The emitter current of a transistor is 10 mA. If α_{dc} =0.99 and I_{CBO} =10 μA calculate the values of I_C and I_B .	**03**
	(b)	Perform the following signed operations. Assume twos complement numbers. $A=1010_2$, $B=0100_2$, Find A-B.	**04**
	(c)	Write a note on collector to base bias.	**07**

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