Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2132003 **Date: 30/11/2019**

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.**

Q.1	**(a)**	Perform binary division of $(1100)_2$ and $(100)_2$ and find quotient, remainder and answer.	**03**
	(b)	Explain positive clamper and negative clamper with circuit diagrams.	**04**
	(c)	Explain the advantages of Digital System over Analog System.	**07**
Q.2	**(a)**	Explain block diagram of digital system with its functional elements.	**03**
	(b)	Construct discrete circuit for NOR Gate using TTL.	**04**
	(c)	Explain NAND Gate as universal Gate.	**07**
		OR	
	(c)	Explain Common Emitter (CE) Configuration with its input and output characteristics.	**07**
Q.3	**(a)**	What are intrinsic and extrinsic semiconductor materials?	**03**
	(b)	Explain circuit diagram and output waveforms of biased positive clipper.	**04**
	(c)	Simplify the following Boolean Expression. Validate using truth table. Also implement the circuit for minimized function using logic gates. $(\bar{A} + \overline{A + B})(\bar{B} + \overline{B + C})$	**07**
		OR	
Q.3	**(a)**	Explain the capacitor input filter with half wave rectifier.	**03**
	(b)	Construct two bit full adder combinational circuit.	**04**
	(c)	Simplify the following function using K-Map method. Also implement the circuit for minimized function using logic gates. F (A, B, C, D) = Π{0,1,3,4,5,7,8,9,11,12,14,15}	**07**
Q.4	**(a)**	Perform BCD addition of $(1001)_2$ and $(0100)_2$.	**03**
	(b)	Explain 8×1 Multiplexer with circuit diagram.	**04**
	(c)	Explain the voltage Doubler, Tripler and Quadrupler circuits in details.	**07**
		OR	
Q.4	**(a)**	Express $(-23)_{10}$ as 8-bit sign number using sign magnitude, 1's compliment and 2's compliment methods.	**03**
	(b)	Convert $(359)_{10}$ to octal number using repeated division by 8 method.	**04**
	(c)	Explain Voltage-Divider Bias Configuration with its advantage.	**07**
Q.5	**(a)**	Explain full wave rectifier with wave forms.	**03**
	(b)	Explain J-K flip-flop with example and wave forms.	**04**
	(c)	Explain working of Serial-in to Serial-out (SISO) shift registers.	**07**
		OR	
Q.5	**(a)**	Explain full wave bridge rectifier with wave forms.	**03**
	(b)	Construct and explain working of 3-bit decoder.	**04**
	(c)	Explain the Ideal, Second and Third approximation for diode in detail with example.	**07**

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