

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 $\alpha_{dc} = 0.99$ and $I_{CBO} = 10 \mu A$ calculate the values of I_C and I_B .	03
	(b) Perform the following signed operations. Assume two's complement numbers. $A = 1010_2$, $B = 0100_2$. Find A-B.	04
	(c) Write a note on collector to base bias.	07
