

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- III EXAMINATION – SUMMER 2026

Subject Code:3132003

Date:19-06-2026

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.
4. Simple and non-programmable scientific calculators are allowed.

	Marks
Q.1 (a) Explain the capacitor input filter with half wave rectifier.	03
(b) Explain the advantages of Digital System over Analog System.	04
(c) Explain Digital logic gates with symbol, algebraic function, and truth table.	07
Q.2 (a) What are intrinsic and extrinsic semiconductor materials?	03
(b) Explain with neat diagram 3 to 8 decoder.	04
(c) Explain the effect of temperature on the V-I Characteristics of Diode.	07
OR	
(c) Explain the input output characteristic of n-p-n transistor in CE configuration. Also indicate different regions.	07
Q.3 (a) Explain clipper briefly.	03
(b) Write down the truth table for full adder and implement it with decoder.	04
(c) Compare the Ideal, Second and Third approximation for diode in detail with example.	07
OR	
Q.3 (a) Explain clamper briefly.	03
(b) Explain the load line analysis for diode.	04
(c) Explain Voltage-Divider Bias Configuration with its advantage.	07
Q.4 (a) State the points of difference between combinational circuit and sequential circuit.	03
(b) Comparison between 1's and 2's compliments.	04
(c) Explain working of Serial-in to Serial-out (SISO) shift registers.	07
OR	
Q.4 (a) What are factors affecting the stability of Q Point?	03
(b) Explain Voltage-Divider Bias Configuration.	04
(c) Explain with neat diagram working of 4-bit bidirectional shift register with parallel load.	07
Q.5 (a) Construct BCD to Excess-3 using 4-bit Binary Adder.	03
(b) Explain the Surface-Mount Transistors.	04
(c) Explain half and full wave rectifier with wave forms.	07
OR	
Q.5 (a) Explain J-K flip-flop with example and wave forms.	03
(b) Explain reverse bias circuit.	04
(c) Explain the voltage Doubler, Tripler and Quadruple circuits in details.	07
