Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–I & II(NEW) EXAMINATION – SUMMER 2023

Subject Code:3110016 Date:11-08-2023

Subject Name:Basic Electronics

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

			MARKS
Q.1	**(a)**	Explain zener diode as a Voltage regulator.	**03**
	(b)	Compare Half wave rectifier and Full wave bridge rectifier for following parameters. (i) Average DC Voltage (ii) Ripple Factor (iii) PIV (iv) Rectifier Efficiency	**04**
	(c)	Illustrate the need of clipper circuit and explain Positive clipper and negative clipper with necessary diagram and waveforms.	**07**
Q.2	**(a)**	Describe the need of biasing the transistor.	**03**
	(b)	Draw the symbol of NPN & PNP transistor, write its different operating regions and also explain why it is called as "Bipolar Transistor".	**04**
	(c)	Discuss Common Collector(CC) configuration of transistor and explain its input and output characteristics.	**07**
		OR	
	(c)	Discuss Common Base(CB) configuration of transistor and explain its input and output characteristics.	**07**
Q.3	**(a)**	Derive the relation between current gain α and β	**03**
	(b)	Describe the factors affecting the Stability of Q point.	**04**
	(c)	Explain the construction, working principle and application of phototransistor.	**07**
		OR	
Q.3	**(a)**	Discuss about leakage current in transistor.	**03**
	(b)	Write a short note on Thermal runaway.	**04**
	(c)	Describe the construction, the symbol, V-I characteristics and application of Tunnel diode.	**07**
Q.4	**(a)**	Discuss about transconductance curve of JFET.	**03**
	(b)	Explain transistor as a switch.	**04**
	(c)	Explain in detail different models used for AC analysis of BJT circuits.	**07**
		OR	
Q.4	**(a)**	Write applications of JFET.	**03**
	(b)	Explain the working of Emitter follower.	**04**

	(c)	Draw h parameter equivalent model for CE amplifier and derive the equation for input impedance, output impedance, Voltage gain and current gain for CE amplifier.	**07**
Q.5	**(a)**	Draw symbol, truth table and Boolean equation for EX-OR and EX-NOR gate.	**03**
	(b)	Compare different logic families.	**04**
	(c)	Explain the construction and principle of operation of Enhancement type P-channel MOSFET.	**07**

OR

Q.5	**(a)**	Design AND, OR and NOT gate using NAND Gate.	**03**
	(b)	Explain Transistor Transistor Logic (TTL).	**04**
	(c)	Explain the construction, working and drain characteristics of N-Channel JFET.	**07**

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