Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–III (NEW) EXAMINATION – WINTER 2024

Subject Code:3134104 **Date:10-12-2024**

Subject Name: Electronic Devices and Circuits

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.**

Q.1*	**(a)**	Explain Energy Hill.	**03**
	(b)	Draw & Explain Energy Band diagram for Conductor, Insulator and Semiconductor	**04**
	(c)	Explain Full wave Bridge Rectifier with its circuit diagram and waveforms	**07**
Q.2	**(a)**	Draw and explain third approximation of Diode.	**03**
	(b)	Explain How to calculate the bulk resistance in PN junction diode.	**04**
	(c)	Explain DC load line for PN junction diode with circuit diagram, waveforms and necessary calculations.	**07**
		OR	
	(c)	Explain Positive and Negative Clipper using its circuit diagram and wave forms.	**07**
Q.3	**(a)**	Compare Zener Breakdown and Avalanche Breakdown	**03**
	(b)	Explain Varactor Diode.	**04**
	(c)	Explain Zener diode as a voltage regulator.	**07**
		OR	
Q.3	**(a)**	Draw and explain the collector curves with indication of its 03 regions.	**03**
	(b)	Derive the relation between DC α (alpha) and DC β (beta) for BJT.	**04**
	(c)	Explain Transistor as a Switch, and also its limitations as a switch.	**07**
Q.4	**(a)**	Explain Optocoupler.	**03**
	(b)	Explain frequency response of an Amplifier.	**04**
	(c)	Explain Emitter biasing method for Transistor Biasing.	**07**
		OR	
Q.4	**(a)**	Explain two Transistor Model in AC biasing of Transistor	**03**
	(b)	Explain Collector feedback bias method for transistor biasing.	**04**
	(c)	Explain Class A amplifier with its circuit diagram and waveforms.	**07**
Q.5	**(a)**	Explain Class C operation with circuit and waveforms.	**03**
	(b)	Explain Transconductance curves for JFET.	**04**
	(c)	Explain construction and operating principle for N Channel Enhancement type MOSFET	**07**

		OR	
Q.5	**(a)**	Compare JFET and MOSFET.	**03**
	(b)	Explain Method of identifying the feedback topology.	**04**
	(c)	Explain effect of Negative Feedback in Amplifier characteristics.	**07**

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