Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3134104 Date:06-07-2024

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.**

			Marks
Q.1	**(a)**	Explain the formation of depletion region when p-type and n-type materials are combined.	**03**
	(b)	Explain effect of temperature on various parameters of a transistor.	**04**
	(c)	Draw and Explain Full wave bridge rectifier circuit.	**07**
Q.2	**(a)**	Draw and explain V-I (voltage- current) characteristics of Zener diode.	**03**
	(b)	What is DC load line? Explain with necessary diagram how it can be applied to find operating point in a given circuit.	**04**
	(c)	Explain construction and working of N-channel MOSFET.	**07**
		OR	
	(c)	Explain Darlington pair connections of two transistors.	**07**
Q.3	**(a)**	Describe JFET applications as constant current source.	**03**
	(b)	Compare CE, CB and CC configurations of a transistor and their applications.	**04**
	(c)	Justify the need of transistor biasing. Explain voltage divider bias of common emitter amplifier in brief.	**07**
		OR	
Q.3	**(a)**	Explain how transistor can be operated as a switch.	**03**
	(b)	Draw and explain series negative clipper waveform with input and output waveforms.	**04**
	(c)	Write a short note on Varactor diode.	**07**
Q.4	**(a)**	Explain Principal of operation of Photodiode.	**03**
	(b)	Derive and explain the relation between current gain α and β in a transistor.	**04**
	(c)	Explain capacitive filter with Ripple Factor.	**07**
		OR	
Q.4	**(a)**	What is the application of positive feedback circuit?	**03**
	(b)	Briefly explain about cooling system for turbo alternators.	**04**
	(c)	Explain construction, operation and characteristic of P-channel Enhancement type MOSFET in detail.	**07**
Q.5	**(a)**	Briefly explain turbine classification.	**03**
	(b)	Compare FET with BJT.	**04**
	(c)	Draw and explain class B push-pull amplifier.	**07**
		OR	
Q.5	**(a)**	Explain basic principle of a solar cell.	**03**
	(b)	Draw Ebers-Moll model and π-model of a transistor.	**04**
	(c)	Explain the working of a transformer coupled class A power amplifier and show the efficiency of class A transformer coupled amplifier is 50%.	**07**

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