Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 2130305 Date: 3/12/2019

Subject Name: Analog Circuits-I

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)**	Define biasing and state the need for biasing.	**03**
	(b)	Draw and explain half wave and full wave rectifier.	**04**
	(c)	Draw and explain output characteristics of CE configuration.	**07**
Q.2	**(a)**	State different configurations of BJT. Define α and β of a transistor.	**03**
	(b)	Compare JFET with BJT	**04**
	(c)	Explain the operation of JFET and derive the drain and transfer characteristics.	**07**
		OR	
	(c)	With neat diagram explain the operation of MOSFET in Enhancement mode and derive its current equations	**07**
Q.3	**(a)**	The transistor has IE= 10 mA and α = 0.98. Find the value of base and collector currents.	**03**
	(b)	Draw the V-I characteristics curve of MOSFET. Explain each parameter.	**04**
	(c)	Draw and explain the various types of negative feedback connection.	**07**
		OR	
Q.3	**(a)**	Give the pin-diagram of IC 741 and illustrate the concept of virtual ground. List out the ideal characteristics of Op-amp.	**03**
	(b)	Define: 1) Input offset Voltage 2) Input offset Current 3) Slew Rate 4) CMRR	**04**
	(c)	Draw the circuit diagram of op-amp Integrator and derive an expression for the output in terms of the input.	**07**
Q.4	**(a)**	What is the need for an instrumentation amplifier? List the features of the instrumentation amplifier.	**03**
	(b)	Draw the subtractor circuit using op-amp and mention its applications.	**04**
	(c)	With neat diagram explain Sample and hold circuit.	**07**
		OR	
Q.4	**(a)**	Explain the voltage to current converter.	**03**
	(b)	With the help of a block diagram, explain the various stages present in an operational amplifier	**04**
	(c)	Design Phase shift Oscillator so that F_0 = 200 Hz.	**07**
Q.5	**(a)**	Give any four application of Comparator.	**03**
	(b)	Explain the working of Log amplifier with the help diagram.	**04**
	(c)	Design Wein Bridge Oscillator so that F_0 = 965 Hz.	**07**
		OR	
Q.5	**(a)**	What is the difference between normal rectifier and precision rectifier?	**03**
	(b)	Draw and explain the circuit diagram of a peak detector.	**04**
	(c)	Draw and explain the circuit diagram for Inverting comparator as Schmitt trigger for R1 = 100ohm, R2 = 56kohm, Vin= 1vpp Sinewave. Determine the threshold voltage and draw the output waveform.	**07**

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