Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (NEW) EXAMINATION – SUMMER 2022

Subject Code:2130902 Date:15-07-2022

Subject Name:Analog 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 basic principal of feed back	**03**
	(b)	Compare various transistor amplifier configurations	**04**
	(c)	What is transistor load line? Explain how to obtain it. Define Q- point on the load line.	**07**
Q.2	**(a)**	Draw and explain OP-AMP as a zero-crossing detector. Give suitable example of its practical application.	**03**
	(b)	Derive the equation for non-inverting amplifier using OP-AMP	**04**
	(c)	Explain the working of a summing and averaging amplifier when connected in inverting mode	**07**
		OR	
	(c)	Derive the expression for the close loop gain, input resistance and output resistance of voltage shunt feedback amplifier	**07**
Q.3	**(a)**	What are the merits & demerits of hybrid parameters?	**03**
	(b)	List the important characteristics of the comparator.	**04**
	(c)	Draw the circuit op-amp as differentiator and explain with necessary waveforms	**07**
		OR	
Q.3	**(a)**	Discuss any one application of PLL	**03**
	(b)	Give comparison of: astable, monostable and bistable multivibrator.	**04**
	(c)	What is an instrumentation amplifier? Explain with the help of neat diagram the operation of an instrumentation amplifier employing the three-basic op-amps and with provision for variation in the voltage gain.	**07**
Q.4	**(a)**	Explain the ideal voltage transfer characteristics of Opamp	**03**
	(b)	Draw basic block schematic of 78×× series three terminal voltage regulator ICs.	**04**
	(c)	Sketch the diagram of 555 timers as an astable multivibrator having 50% duty cycle. Explain its working and derive equation for frequency of output waveform	**07**
		OR	
Q.4	**(a)**	Describe Sample and Hold circuit.	**03**
	(b)	Explain Schmitt Trigger circuit.	**04**
	(c)	Explain with circuit diagram the operation of a VCO.	**07**
Q.5	**(a)**	Compare between active and passive filters.	**03**
	(b)	Explain with the help of circuit diagram, the operation of second order Butterworth high pass filter.	**04**
	(c)	Describe the basic building blocks of PLL.	**07**

OR

Q.5	**(a)**	Explain the effect of negative feedback on frequency response of an op amp.	**03**
	(b)	Describe how an Op-amp may be used as current to voltage converter	**04**
	(c)	Define the following a) Pass band b) Stop band c) Attenuation d) Cut off frequency.	**07**

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