Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–IV (NEW) EXAMINATION – WINTER 2020

Subject Code:3141706 Date:09/02/2021

Subject Name:Analog Signal Processing

Time:02:30 PM TO 04:30 PM Total Marks:56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain the following terms: 1) CMRR 2) Input Bias Current	**02** **01**
	(b)	Define Input Offset Voltage and Slew Rate	**04**
	(c)	Describe the basic integrator circuit using opamp. Mention the problems associated with the basic integrator and the methods to eliminate them. Also derive the formula for f_b and f_a.	**07**
Q.2	**(a)**	Explain the working of the I-V converter circuits with necessary derivations	**03**
	(b)	Explain the working of the V-I converter circuit with grounded load with necessary derivations.	**04**
	(c)	Define Negative Feedback. Mention all the four basic configurations for negative feedback. Describe opamp in voltage series configuration and derive the expression for closed loop voltage gain.	**07**
Q.3	**(a)**	Explain the working of Sample and Hold circuit with necessary diagrams.	**03**
	(b)	Explain positive and negative clampers with necessary diagrams.	**04**
	(c)	Explain the working of D/A converter with Binary weighted resistors.	**07**
Q.4	**(a)**	Explain positive clippers with necessary diagrams.	**03**
	(b)	Explain the working of Schmitt Trigger circuits with necessary diagrams and derivations.	**04**
	(c)	Explain the working of D/A converter with R-2R ladder network.	**07**
Q.5	**(a)**	Define instrumentation amplifier. where it is used?	**03**
	(b)	Describe instrumentation amplifier using Resistive Transducer Bridge	**04**
	(c)	Explain the working of 555 timer in Monostable mode with necessary equations and waveforms.	**07**
Q.6	**(a)**	Explain Isolation amplifier.	**03**
	(b)	Explain Logarithmic amplifier.	**04**
	(c)	Explain the working of 555 timer as Astable multivibrator with necessary equations and waveforms.	**07**
Q.7	**(a)**	Give the necessary conditions for sustaining oscillations.	**03**
	(b)	Draw the circuit for Wein-Bridge oscillator and derive expression for output frequency of oscillation.	**04**
	(c)	Describe 1st order active Butterworth low-pass filter and derive its transfer function.	**07**

Q.8 **(a)** Explain the working of Notch Filter. **03**

(b) Design a Narrow Band-Pass filter such that f_c=1Khz, Q=3,A_f =10. Assume the value of capacitors to be 0.01uF. **04**

(c) Explain Square wave generator using opamp. Using it, explain how we can generate a triangular wave. **07**

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