Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV EXAMINATION – SUMMER 2020

Subject Code: 3141706 **Date:26/10/2020**

Subject Name: Analog Signal Processing

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.**

			MARKS
Q.1	**(a)**	Define Following terms: 1. CMRR 2. SVRR 3. Slew Rate	**03**
	(b)	Draw and explain in brief the internal block diagram of an Op-Amp.	**04**
	(c)	Derive the equation of voltage gain of differential amplifier using one Op-Amp (Closed loop configuration) with its circuit diagram.	**07**
Q.2	**(a)**	Draw and explain Voltage follower circuit using an Op-Amp.	**03**
	(b)	Explain Bandwidth and Total output offset voltage for Inverting Amplifier with feedback.	**04**
	(c)	Derive the equation of voltage gain of Non-Inverting Summing amplifier using an Op-Amp with its circuit diagram.	**07**
		OR	
	(c)	Draw and explain Voltage to Current converter with floating load using an Op-Amp.	**07**
Q.3	**(a)**	Explain Subtractor circuit using an Op-amp.	**03**
	(b)	Explain Zero Crossing detector circuit using an Op-Amp with input/output waveforms.	**04**
	(c)	Explain Practical Differentiator circuit using an Op-Amp with its circuit diagram. Frequency response, input/output waveforms.	**07**
		OR	
Q.3	**(a)**	Draw and Explain Voltage limiter circuit using an Op-Amp.	**03**
	(b)	Draw and explain Sample and Hold circuit using an Op-Amp.	**04**
	(c)	Draw Op-amp based full wave rectifier (absolute value output) circuit. Explain its working with necessary input/output waveforms.	**07**
Q.4	**(a)**	Design + 5V power supply using 7805 with its circuit diagram	**03**
	(b)	Explain adjustable voltage regulator using LM 317.	**04**

	(c)	Explain Instrumentation Amplifier using three Op-Amp Configuration and also derive the equation for the output voltage.	**07**

OR

Q.4	**(a)**	Explain Voltage controlled Oscillator (VCO) using IC 566.	**03**
	(b)	Draw and explain Square wave generator circuit using an Op-Amp.	**04**
	(c)	Explain Successive Approximation type Analog to Digital	**07**
Q.5	**(a)**	Explain All Pass filter.	**03**
	(b)	Draw and explain Programmable Gain Amplifier.	**04**
	(c)	Explain first order Low pass Butterworth Active filter with circuit diagram and derivation of its transfer function.	**07**

OR

Q.5	**(a)**	Explain Notch filter with its circuit diagram and necessary waveforms.	**03**
	(b)	Explain Ramp Generator circuit using 555 timer in Astable mode operation.	**04**
	(c)	Explain Monostable operation of 555 timer with its internal block diagram with its output voltage and capacitor voltage waveforms.	**07**

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