

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– IV (New) EXAMINATION – WINTER 2019****Subject Code: 2141002****Date: 07/12/2019****Subject Name: Analog Circuit Design****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) What do you mean by Voltage regulator? List different types of voltage regulators.	03
	(b) What are the characteristics of an ideal Op-amp?	04
	(c) Draw the hybrid Π common emitter transistor model. Derive the expression for input conductance.	07
Q.2	(a) Draw and explain block diagram of Op-amp.	03
	(b) How Op-amp can be used as an integrator?	04
	(c) Explain Op-amp based Zero Crossing Detector with circuit diagram and waveforms.	07
OR		
	(c) Explain wide band-pass filter with necessary circuit, derivation and waveforms.	07
Q.3	(a) Explain procedure of offset null for Op-amp IC.	03
	(b) What is thermal drift? How does it affect the performance of an Op-amp circuit?	04
	(c) What is the need of clipper circuit? Explain Op-amp based positive clipper circuit with necessary waveforms.	07
OR		
Q.3	(a) How Op-amp can be used as a summing amplifier?	03
	(b) Draw block diagram of Phase Locked Loop (PLL) and briefly explain its working. State applications of PLL.	04
	(c) Write short note on: Sample and Hold Circuits.	07
Q.4	(a) Define the terms: (i) CMRR (ii) Slew Rate (iii) Offset voltage.	03
	(b) Draw Op-amp based two-sided voltage limiter circuit and its response.	04
	(c) Draw and explain triangular and sawtooth wave generator circuit using Op-amp.	07
OR		
Q.4	(a) Design Op-amp based RC phase oscillator for the frequency of 5 KHz.	03
	(b) What is an oscillator? Explain the concept of oscillation with Barkhausen criteria.	04
	(c) Explain in detail operation of Full wave precision rectifier with circuit diagram and waveforms.	07
Q.5	(a) Draw the circuit of Peak Detectors using Op-amp.	03
	(b) Explain the working of Monostable multivibrator using IC 555.	04
	(c) Explain the working of a Schmitt trigger using Op-amp.	07
OR		
Q.5	(a) Explain voltage-to-Current converter circuit using Op-amp.	03
	(b) List advantages of Schmitt trigger over the conventional comparators.	04
	(c) Explain the working of Hartley oscillator. Derive the expression for frequency of oscillation.	07
