

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2141002

Date:09/02/2021

Subject Name:Analog Circuit Design

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.

	MARKS
Q.1 (a) Enlist the ideal characteristics of OPAMP.	3
(b) List the parameter those affecting to the transistor at high frequencies.	4
(c) Draw the hybrid π model for CE configuration and explain it.	7
Q.2 (a) How op-amp is used as a summing amplifier?	3
(b) What is oscillator? What are the necessary conditions for the oscillations?	4
(c) Derive the expression for the frequency for the RC phase shift oscillator using transistor.	7
Q.3 (a) List the merits & Demerits of negative feedback.	3
(b) Define the following parameters of Op-Amp: (i) Slew rate (ii) CMRR (iii) Input offset voltage (iv) PSRR	4
(c) Derive the A_{vf} , R_{if} , & R_{of} for Voltage Amplifier.	7
Q.4 (a) Draw the block diagram of OPAMP.	3
(b) Draw the Block diagram of various Feedback topologies and explain the significance of each topology.	4
(c) For the voltage amplifier $A_v = 140$, $f_L = 200$ Hz, $f_H = 200$ KHz, $R_i = 2K\Omega$, $R_o = 4.7K\Omega$. When negative feedback is employed in it with $\beta = 0.4$, determine the A_{vf} , R_{if} , R_{of} , F_{LH} , F_{HF} .	7
Q.5 (a) What is precision rectifier?	3
(b) Explain the working of a Schmitt trigger using Op-amp.	4
(c) Explain the ideal integrator. What are the problems associated with this configuration? How it can overcome?	7
Q.6 (a) Explain operation of PLL with basic blocks.	3
(b) Explain instrumentation amplifier.	4
(c) Explain with the circuit diagram and waveforms, the monostable multivibrator using 555 timer.	7

- Q.7** (a) Classify filter on the basis their frequency response. **3**
(b) What is the difference between active and passive filters? **4**
(c) Show how Bi-quad circuit can be used as a universal filter? **7**
- Q.8** (a) Discuss magnitude and frequency scaling in filter design. **3**
(b) What do you mean by Voltage regulator? List different types of voltage regulators. **4**
(c) Design and explain the 2nd order low pass Butterworth filter. Derive the equation of gain for the same. **7**
