

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2141002

Date:09/05/2019

Subject Name: Analog Circuit Design

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.

		MARKS
Q.1	(a) List out characteristics of ideal op-amp.	03
	(b) Compare RC phase shift oscillator with Wien bridge oscillator.	04
	(c) List the parameter those affecting to the transistor at high frequencies. Draw the hybrid π model for CE configuration and explain it. Also derived the equation for any two above listed parameter for CE configuration.	07
Q.2	(a) Write short note on validity of hybrid- π model.	03
	(b) Draw and explain the equivalent circuit of a crystal.	04
	(c) Explain various open loop configuration of op-amp.	07
	OR	
	(c) Derive expression for closed loop gain of a voltage series feedback amplifier using op-amp.	07
Q.3	(a) Draw and explain block diagram of op-amp.	03
	(b) Define the following parameters of Op-Amp: (i) Input bias current (ii) CMRR (iii) Input offset voltage (iv) Input offset current	04
	(c) Show how Op-Amp can be used as summing, scaling and averaging amplifiers using non inverting configuration.	07
	OR	
Q.3	(a) What is differential amplifier? Explain in brief.	03
	(b) Define the following parameters of Op-Amp: (i) Slew Rate (ii) PSRR (iii) Gain-Bandwidth Product (iv) Output offset voltage	04
	(c) Explain the basic differentiator using an op-amp. What are the problems associated with this configuration? How they are overcome?	07
Q.4	(a) State the properties of Butterworth filter.	03
	(b) Draw and explain zero crossing detector.	04
	(c) Draw the non-inverting Schmitt trigger circuit and explain the threshold levels and hysteresis.	07
	OR	
Q.4	(a) What is thermal drift? How does it affect the performance of an op-amp circuit?	03
	(b) Draw and explain peak detector.	04
	(c) What is PLL? Explain operation of PLL with basic blocks and mention any four applications of it in radio communication.	07
Q.5	(a) Briefly explain Notch filter.	03
	(b) For an astable multivibrator using 555 timer, $R_A=2.2K\Omega$, $R_B=3.9K\Omega$ and $C=0.1\mu F$, determine the positive pulse width, negative pulse width and free running frequency.	04
	(c) Draw sallen-key LPF and derive its transfer function.	07
	OR	
Q.5	(a) What is the difference between active and passive filter.	03
	(b) Discuss magnitude and frequency scaling in filter design.	04
	(c) Show how Bi-quad circuit can be used as a universal filter?	07
