Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V • EXAMINATION – WINTER 2016

Subject Code: 151003 **Date: 24/11/2016**
Subject Name: Integrated Circuits and Applications
Time: 10:30AM – 01:00PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the types of comparator? Explain the operation of an inverting comparator using op-amp. with the help of input and output waveforms. Enlist the applications of comparator.	**07**
	(b))	Explain working of monostable multivibrator using IC 555 with internal blocks and waveforms. write applications of it.	**07**
Q.2	**(a)**	Draw and explain circuit diagram of instrumentation amplifier using transducer bridge and op-amp. Enlist the applications of it.	**07**
	(b)	Draw and explain Triangular and Saw tooth wave generator circuit using op-amp.	**07**
		OR	
	(b)	Explain the operation of first order Butterworth low-pass filter with the help of circuit diagram, derivation and waveforms.	**07**
Q.3	**(a)**	Explain wide band-pass filter with necessary circuit, derivation and waveforms.	**07**
	(b)	State the applications of operational transconductance amplifier and explain any one with necessary circuit and derivations.	**07**
		OR	
Q.3	**(a)**	What is PLL? Explain operation of PLL with basic blocks and mention any four applications of it in radio communication.	**07**
	(b)	Write short note on: (i) Zero Crossing Detector (ii) Peak Detector	**07**

Q.4	**(a)**	Draw the circuit of basic differentiator using an op-amp. What are the problems associated with this configuration? How they are overcome?	**07**
	(b)	Design a circuit using Operational amplifier in non- Inverting configuration that will give sum of three different input voltages.	**07**

OR

Q.4	**(a)**	Derive the expression for voltage gain , input resistance, output resistance and bandwidth of an inverting amplifier using op-amp with negative voltage shunt feedback.	**07**
	(b)	Draw clamper circuit using op-amp. and explain operation of it with the help of necessary waveforms	**07**
Q.5	**(a)**	Write short note on: Monolithic Power Amplifier (LM380)	**07**
	(b)	Explain working of Free Running Ramp Generator with necessary circuit and waveforms.	**07**

OR

Q.5	**(a)**	Draw and explain the circuit of practical inverting integrator using an op-amp. with necessary derivations.	**07**
	(b)	Give classification of filters with four basic types. Discuss importance of magnitude and frequency scaling in filter design.	**07**

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