Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

P.D.D.C. Sem - IV Examination June- 2011

Subject code: X41103

Subject Name: Integrated Circuits and Applications

Date:06/06/2011 **Time: 10.30 am – 01.30 pm**

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 problems associated with basic differentiator circuit? How they can be eliminated? Justify the answer with the help of circuit diagrams and frequency response.	**07**
	(b)	Draw and explain triangular wave generator circuit and it's waveform.	**07**
Q.2	**(a)**	Draw and explain block diagram representation of typical op-amp.	**07**
	(b)	Explain following electrical parameters of op-amp in brief: 1. Input offset voltage 2. Input bias current 3. common-mode rejection ratio 4. Supply voltage rejection ratio	**07**
		OR	
	(b)	Draw voltage series feedback amplifier circuit and derive expressions for the following: 1. Closed loop voltage gain 2. Input resistance with feedback 3. Bandwidth with feedback	**07**
Q.3	**(a)**	Draw and explain offset voltage compensated noninverting and differential amplifiers.	**07**
	(b)	Draw differential instrumentation amplifier using a transducer bridge and derive expression for it's gain.	**07**
		OR	
Q.3	**(a)**	Draw and explain second order low pass Butterworth filter and it's frequency response. Give design steps for this filter.	**07**
	(b)	What are the problems associated with zero crossing detector circuit. Draw and explain the circuit which solves these problems.	**07**
Q.4	**(a)**	Design a first order high-pass filter at a cutoff frequency of 1 KHz with a passband gain of 2. Plot the frequency response of the same.	**07**
	(b)	Draw and explain active narrow band reject filter and it's frequency response. Design 60 Hz active notch filter.	**07**
		OR	
Q.4	**(a)**	What is the application of sample and hold circuit? Draw and explain the working of sample and hold circuit.	**07**
	(b)	Draw and explain positive and negative clipper circuits.	**07**
Q.5	**(a)**	Explain the operation of 555 IC as a monostable multivibrator with necessary schematic diagram and waveforms.	**07**
	(b)	Explain adjustable positive voltage regulators.	**07**
		OR	
Q.5	**(a)**	What are the features of Sallen-key filters? Draw second order low pass and band pass Sallen-key filters.	**07**
	(b)	Discuss the application of Phase Locked Loop as frequency multiplier.	**07**

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