Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-IV Examination-Nov-2011

Subject code: X41103 **Date: 25/11/2011**

Subject Name: Integrated Circuit and application

Time: 2.30 pm -5.00 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)**	Explain the Characteristics of Ideal Op-amp (03) Short Note : Comparator circuit using Op-amp (04)	**07**
	(b)	Derive the expression for voltage gain, input resistance, output resistance and bandwidth of non inverting amplifier using Op-amp with negative voltage series feedback	**07**
Q.2	**(a)**	Explain application of Op-amp (Inverting Configuration) as Summing, Scaling and averaging circuit	**07**
	(b)	Define following terms 1.CMRR 2.PSRR 3.Slew Rate 4.Input Offset voltage 5.Input Offset current 6.Input bias current 7.Equivalent input noise voltage and current	**07**
		OR	
	(b)	Draw Circuit diagram of differential amplifier with three op-amp and derive expression for its output signal as function of input signal	**07**
Q.3	**(a)**	Draw Circuit diagram of Schmitt trigger by Op-amp and explain it.	**07**
	(b)	Draw Circuit diagram of Clipper and Clamper by Op-amp and explain it.	**07**
		OR	
Q.3	**(a)**	Draw and explain working Op-amp based half wave rectifier circuit. How is it better in performance compared to half wave rectifier circuit without Op-amp	**07**
	(b)	Draw and Explain Working Op-amp based log amplifier	**07**
Q.4	**(a)**	Explain working of 555 based astable multivibrator.	**07**
	(b)	What are Different types of Voltage regulator? Discuss LM317 based adjustable voltage regulator	**07**
		OR	
Q.4	**(a)**	Explain working of 555 based monostable multivibrator. Design same for output pulse width of 10ms.	**07**
	(b)	Draw and explain Triangular and Saw tooth wave generator circuit using Op-amp	**07**
Q.5	**(a)**	Design a Differentiator circuit by using Op-amp to differentiate an input signal that varies in frequency from 10 Hz to about 1 KHz. Draw its frequency response	**07**
	(b)	Draw Circuit diagram of Op-amp based first order Low pass Butterworth filter and explain it	**07**
		OR	
Q.5	**(a)**	Draw Op-amp based Integrator circuit and derive expression for its output voltage in terms of its input voltage	**07**
	(b)	Draw circuit diagram of Op-amp based first order high pass Butterworth filter and explain it.	**07**

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