Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: X41103 **Date: 21-06-2014**

Subject Name: Integrated Circuits and Applications

Time: 10:30 am - 01:00 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)**	Derive the equations of closed loop voltage gain, input resistance and output resistance with feedback for voltage series negative feedback amplifier.	**07**
	(b)	Explain Biquad filter design in detail.	**07**
Q.2	**(a)**	The 741C op-amp having the following parameters is connected as a non-inverting amplifier with $R_1 = 2.7k\Omega$ and $R_F = 15k\Omega$: A = 200000, Ri = 2MΩ, Ro = 75Ω, fo = 5Hz, supply voltage = ±15V, output voltage swing = ±13V. Compute the values of A_F, R_F, R_{OF}, f_F, and V_{OOT}.	**07**
	(b)	Explain RC-CR transformation in detail.	**07**
		OR	
	(b)	Design a bandpass filter with a center frequency at ω_o =1000 rad/sec, a bandwidth of 200 rad/sec, and a maximum gain of 1, using the biquad circuit.	**07**
Q.3	**(a)**	Explain differential amplifier with two op-amps in detail.	**07**
	(b)	Explain summing, scaling and averaging amplifier using op-amp inverting configuration in detail.	**07**
		OR	
Q.3	**(a)**	Explain DIDO amplifier in detail.	**07**
	(b)	Explain voltage-to-current converter with grounded load in detail.	**07**
Q.4	**(a)**	Explain differentiator using op-amp in detail.	**07**
	(b)	Explain square wave generator using op-amp in detail.	**07**
		OR	
Q.4	**(a)**	Explain Schmitt trigger circuit using op-amp in detail.	**07**
	(b)	Explain Monostable Multivibrator using 555 timer in detail.	**07**
Q.5	**(a)**	Explain operating principles and phase detector of phase-locked loop in detail.	**07**
	(b)	Explain adjustable voltage regulators in detail.	**07**
		OR	
Q.5	**(a)**	Explain fixed voltage regulators in detail.	**07**
	(b)	Explain astable multivibrator using 555 timer in detail.	**07**

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