Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –II Examination Dec. - 2011

Subject code: 1720302 **Date: 12/12/2011**
Subject Name: Advance Instrumentation
Time: 02.30 pm – 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.**

Q.1	**(a)**	Design 4th order butter worth high pass filter for A_{AHF}=1 and 3-dB cut off frequency Fc= 1000 Hz	**07**
	(b)	Derive an equation for output impendence of non-inverting operational amplifier.	**07**
Q.2	**(a)**	Draw and explain circuit diagram of Instrumentation amplifier and compare with three stage amplifier.	**07**
	(b)	Drive an equation and draw the circuit diagram that shows op-amp gain is affected by offset.	**07**
		OR	
	(b)	List and explain Operational Amplifier noise	**07**
Q.3	**(a)**	Explain circuit diagram of Low pass KRC filter with diagram	**07**
	(b)	Design low pass filter for A_{min}= 40 dB, A_{max}= 3 dB KHz, f_c=2.5 KHz , Fs= 5 KHz with unity gain.	**07**
		OR	
Q.3	**(a)**	Derive an equation for input impendence of inverting operational amplifier.	**07**
	(b)	Design Low pass filter using sallen configuration. Stop band attenuation is 54 dB. Pass band attenuation is 3 dB. Passband frequency where attenuation gain is maximum is 10 KHz. Stop band frequency is 20 KHz. Gain is unity.	**07**
Q.4	**(a)**	Design seventh order filter for fc= 1KHz and Ho= 0. Assume value of capacitors and resistors in circuit are equal.	**07**
	(b)	Derive an equation of CMRR amplifier.	**07**
		OR	
Q.4	**(a)**	Draw and explain circuit diagram of differentiator with effect of capacitance on gain and frequency on operational amplifier.	**07**
	(b)	Draw and explain high pass KRC filter with it equation with Q factor.	**07**
Q.5	**(a)**	Draw and explain difference amplifier.	**07**
	(b)	Draw and explain circuit diagram with V/I converter.	**07**
		OR	
Q.5	**(a)**	How performance of integrator can be improved?	**07**
	(b)	Draw and explain circuit diagram with I/V converter.	**07**

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