Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-II Examination July 2010

Subject code: 720302

Subject Name: Advance Instrumentation

Date: 06 /07 /2010 **Time: 11.00am – 1.30pm**

Total Marks: 60

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **student can use the only table for calculation.**

Q.1	**(a)**	Design the low pass filter with f_o = 9 Khz and Q = 2 using the unity gain.	**06**
	(b)	Drive an equation to relate between input impendence and gain with figure.	**06**
Q.2	**(a)**	Design 4th order butter worth high pass filter for A_{AHF} = 1 and 3- dB cut off frequency f_c = 668Hz	**06**
	(b)	Draw and explain low pass KRC filter and derive equation of Q.	**06**
		OR	
	(b)	Explain Op-amp Noise.	**06**
Q.3	**(a)**	Design the second order band pass filter with f = 2 KHz and Bandwidth is 100 Hz. Find the resonance gain and design the circuit for resonance gain 20 dB.	**06**
	(b)	Design the seventh order butter worth filter fc = 1 Khz , H_0 = 0 db, $C_1 = C_2$ and $R_2 = R_2$.	**06**
		OR	
Q.3	**(a)**	"Output voltage error is proportional to input offset voltage". Justify your answer with diagram and necessary reasons.	**06**
	(b)	Explain an effect of imbalance factor on CMRR for difference amplifier.	**06**
Q.4	**(a)**	Find the dc gain of low pass second order low pass filter for fc = 2 KHz and Q= 5. Modify the above circuit for dc gain 0 dB.	**06**
	(b)	Explain differentiator along with frequency response.	**06**
		OR	
Q.4	**(a)**	How performance of integrator may improved by selecting the high quality of capacitor?	**06**
	(b)	How Resistance R make I-V converter very highly sensitive?	**06**
Q.5	**(a)**	"Output impendence and gain both is frequency dependant". Justify your answer with necessary figure and equation.	**06**
	(b)	Which operational amplifier configuration is used for zero error due to common mode gain? Why?	**06**
		OR	
Q.5	**(a)**	Enumerate and explain any three types of noise.	**06**
	(b)	Draw and explain Howland current pump V-I converter.	**06**

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