GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER II– EXAMINATION – WINTER - 2016			
Subject Code: 2720312 Date: 17/11/2016			
Subject Name: Intelligent Sensor and Instrumentation Time: 2:30 pm to 5:00 pm Total N Instructions:			Marks: 70
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks	
Q.1	(a)	Explain in detail standard second order responses of low-pass, high pass and band-pass active filters.	- 14
Q.2	(a) (b)	Briefly explain types of standards used for smart sensors. Compare between active and passive filter <b>OR</b>	07 07
	<b>(b)</b>	Explain wireless sensor network in detail.	07
Q.3	(a)	Show that $A = -\left[1 + \frac{R3}{R4}\right] * \frac{R1}{R2}$	07
		$v_{1} \stackrel{\bullet}{=} \qquad \qquad$	
	<b>(b)</b>	Explain differentiator along with frequency response.	07
Q.3	(a) (b)	Describe the effect of finite GBP on integrator circuit. What is the significance of Instrumentation amplifier? Discuss the various configuration of instrumentation amplifier.	07 07
Q.4	(a)	Draw and explain band pass KRC filter with its equation with Q factor.	07
	<b>(b)</b>	Draw and explain Howland current pump V-I converter. OR	07
Q.4 Q.4	(a) (b)	Explain switched capacitor in detail. Explain the error caused by Input bias and offset currents in detail.	07 07
Q.5	(a)	Explain unity gain KRC low pass filter with necessary circuit diagram. (a)Design a second-order low-pass butterworth filter with a -3dB frequency of 10 KHz. (b)If $V_i(t) = 10\cos(4\pi 10^4 t - 90^\circ)V$ , find $V_0(t)$ .	14
Q.5	(a)	<b>UK</b> Design 4th order high pass butter worth filter for unity gain and 3 dB cutoff frequency Fc= 668 Hz.	14