C.U.SHAH UNIVERSITY Summer Examination-2016

Subject Name : Instrumentation and Sensors

	Subject Code : 4SC06ISE1			Branch:B.Sc.(Physics)							
	Semeste	r : 6	Date : 17/05/2016	Time : 02:30 To 05:30	Marks : 70						
	Instructio (1) (2) (1) (3) (1) (4) (2)	 Instructions: (1) Use of Programmable calculator & any other electronic instrument is prohibited. (2) Instructions written on main answer book are strictly to be obeyed. (3) Draw neat diagrams and figures (if necessary) at right places. (4) Assume suitable data if needed. 									
Q-1		Attempt t	he following questions:			(14)					
	a)	Sensors th a. active b. passive	at require no external pow _ sensor	er source to create an output is l	known as a(n)	1					
	b)	d. thermo A(n) a. insertion b. applicat	error is when the sensor n ion	can not keep up with a fast-mov	ving input.	1					
	c)	 d. dynami Sensor ou a. linearity b. offset c. resolution 	c tput levels when the input	is zero is known as the sensor's		1					
	d)	 d. precision A thermise temperature a. neutral b. positive c. negative 	n tor that increases in resista re coefficient.	nce when heat decreases has a _		1					
	e)	d. variableOne of thethe followa. Photocb. Photocc. Photoc	e most widely used forms of ing statements is correct? liode is an example of a pl liode is an example of a ph liode can be used as either Pag	of light sensor is the photodiode. hotoconductive sensor notovoltaic sensor a photoconductive or a photovo e 1 3	Which of	1					



	f)	d. Photodiode is an examples of a inverter device. Which of the following statements is correct?	1
		a. Sensor and transducers are both examples of actuators	
		b. Actuators and transducers are both examples of sensor	
		c. Sensors and actuators are both examples of transducers.	
		d. Sensor, transducers and actuator are conductive devices.	
	g)	What term describes the maximum expected error associated with a measurement	1
		or a sensor?	
		a. Precision	
		b. Resolution	
		c. Accuracy	
	b)	a. Kange Which of the following forms of temperature sensor produces a large change in	1
	11)	its resistance with temperature, but is very non-linear?	1
		a. A thermistor	
		b. A PN Junction sensor	
		c. A Platinum resistance thermometer	
		d. A Photo Transistor.	
	i)	Define the following terms	6
		1. Calibration	
		2. Ratio errors	
		5. Strain Gauges 4. Transducer	
		5. Thermometer	
		6. Acoustic Measurement	
Atten	n <mark>pt any</mark> f	four questions from Q-2 to Q-8	
Q-2		Attempt all questions	(14)
-	a)	Explain the Dynamic Characteristics of Piezo-Electric Transducers with help of	5
		sketch	
	b)	Explain the classification of Transducer Elements.	5
0.1	c)	Discussed the varies types of Pressure Measurements with help of sketch	4
Q-3	a)	Attempt all questions Write a short note following terms	(14)
	a)	i) Cathode Ray Oscilloscope	/
		ii). Thermoelectric Sensors	
	b)	Explain with figure the Optical-Fiber Sensors,	7
Q-4	,	Attempt all questions	(14)
	a)	Write the comparison between the smart sensor and optical –fiber sensor	7
	b)	Explain the construction and principle for Bimetallic Thermometer	7
Q-5		Attempt all questions	(14)
	a)	Write the comparison between Photoconductive Transducer and Photo-voltaic	7
	b)	Transducer. What is meaning of McL and Cauga and explain it with figure?	7
0-6	U)	Attempt all questions	/ (14)
V-N	a)	Write and explain the all methods for Radiation.	(14)
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	b)	Explain the Non-dispersive infrared gas analyzer	4
	c)	Write prone and cone about the Bio-sensor	3
Q-7		Attempt all questions	(14)
	a)	Write and explain the bounded and unbounded condition for strain gauge elements.	7
	b)	Discuses about the types of Microphones with help of sketch	7
Q-8		Attempt all questions	(14)
-	a)	Explain the Measurements of environmental air pollution parameters with mathematic equations.	7
	b)	How can work the Smoke density measurements.	7



