GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160620   **Date:20-05-2024**
Subject Name:Instrumentation and Sensors
Time:10:30 AM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

			MARKS
Q.1	(a)	Give the definition of a) Measurement b) Instrumentation.	**03**
	(b)	List out various physical variables.	**04**
	(c)	What do you mean by sensor? Explain different types of sensors in detail.	**07**
Q.2	(a)	What are the different types of signal and differentiate it.	**03**
	(b)	Explain the types of Systematic errors in measurement.	**04**
	(c)	Draw and Explain the block diagram of instrumentation system.	**07**
		OR	
	(c)	Explain the basic concepts in frequency domain signal processing and analysis.	**07**
Q.3	(a)	Explain the flow of planning of monitoring programs.	**03**
	(b)	List out and explain the Criteria for Sensor Selection.	**04**
	(c)	List out various temperature sensors and explain any one of them.	**07**
		OR	
Q.3	(a)	Why Piezometer is used ? Give the types of Piezometers.	**03**
	(b)	What is a noise? & explain the different types of noise.	**04**
	(c)	Explain the different Data Reduction Techniques in detail.	**07**
Q.4	(a)	Explain the Frequency resolution.	**03**
	(b)	Explain in brief sensor installations.	**04**
	(c)	Draw the functional block diagram of measurement system. Mentions the purpose of measurement. What are the methods of measurement?	**07**
		OR	
Q.4	(a)	List any two light sensors.	**03**
	(b)	Write a short note on the time domain signal processing.	**04**
	(c)	Explain types of filters used in frequency domain analysis	**07**
Q.5	(a)	Define following term 1. Median 2. Range	**03**
	(b)	Write a short note on the data analysis and interpretation with reference to inclinometer.	**04**
	(c)	Explain the Classification of Transducer in detail.	**07**
		OR	
Q.5	(a)	What is the Working principle of Load Cell.	**03**
	(b)	Write a short note on the Fast Fourier Transform (FFT).	**04**
	(c)	Explain the need for frequency domain analysis and its principles.	**07**