Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160620 Date:26-05-2025

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)**	Define: i) Transducer ii) Sensor.	**03**
	(b)	List the use of following given sensor 1.Piezometer 2.Inclinometer	**04**
	(c)	List various Flow sensor and explain any one of them	**07**
Q.2	**(a)**	What is strain gauge? & explain load cell.	**03**
	(b)	Explain the principle and working of a strain gauge .Derive the expression of gauge factor.	**04**
	(c)	Draw and explain the block diagram of the instrumentation system.	**07**
		OR	
	(c)	Discuss in detail various types of errors associated in measurement and how these errors can be minimized?	**07**
Q.3	**(a)**	Define target for Approach to Planning Monitoring Programs.	**03**
	(b)	Explain in brief sensor installations.	**04**
	(c)	Explain the types of proximity sensors and describe their use as accelerometer and vibration sensor	**07**
		OR	
Q.3	**(a)**	Explain Measurement uncertainty.	**03**
	(b)	Differentiate between continuous and discrete signals.	**04**
	(c)	Write a short note on to predict the response ofvarious inputs.	**07**
Q.4	**(a)**	What is aliasing? How can it remove?	**03**
	(b)	List Criteria for Sensor Sitting.	**04**
	(c)	Explain one case study of Approach to Planning and Monitoring Programs	**07**
		OR	
Q.4	**(a)**	Define Signal and Noise.	**03**
	(b)	Define (i) Variance (ii) Deviation (iii) Median (iv) Mode.	**04**
	(c)	Explain types of filters used in frequency domain analysis	**07**
Q.5	**(a)**	Define following term 1.Averagevalue (mean) 2. Standarddeviation	**03**
	(b)	Differentiate between types of sensors and their modes of operation and measurement.	**04**
	(c)	Explain the need for frequency domain analysis and its principles.	**07**
		OR	
Q.5	**(a)**	Describe Noise reduction with filters.	**03**
	(b)	Write a short note on the time domain signal processing.	**04**
	(c)	What is FFT and explain its application in civil engineering.	**07**

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