

Enrolment No./Seat No _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2025

Subject Code:2170913

Date:19-05-2025

Subject Name:Industrial Instrumentation

Time:02:30 PM TO 05:00 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 industrial instrumentation. Draw functional block diagram of an instrumentation system.	03
	(b) Define: (i) Hysteresis (ii) Repeatability (iii) Accuracy (iv) Dead Zone.	04
	(c) State static and dynamic characteristics of an instrumentation system.	07
Q.2	(a) Differentiate between active and passive transducer with example.	03
	(b) Write a short note on Hall effect transducer. Also state its applications.	04
	(c) Explain construction and working principle of LVDT. Explain how it will detect displacement.	07
	OR	
	(c) State basic principle of piezo electric transducer. Draw an equivalent circuit. Also derive an equation for the output voltage.	07
Q.3	(a) Define: (i) Absolute pressure (ii) Gauge pressure (iii) Static pressure	03
	(b) Enlist different types of load cells. Briefly explain any one of them.	04
	(c) Explain the following characteristics of a Transducer. (i) Precision (ii) Resolution (iii) Sensitivity (iv) Threshold (v) Repeatability (vi) Accuracy (vii) Hysteresis.	07
	OR	
Q.3	(a) Enlist methods of torque measurement. Explain any one of them in brief.	03
	(b) Explain Variable Dielectric Constant method for measurement of Liquid level using capacitive transducer.	04
	(c) Write a short note on Ultrasonic flow meter.	07
Q.4	(a) What is Hall effect? State application of hall effect transducer.	03
	(b) Explain flow measurement technique using Hot Wire Anemometer.	04
	(c) Explain construction and working principle of thermocouple. Also state its applications.	07
	OR	
Q.4	(a) How capacitive transducer is used for angular displacement?	03
	(b) Briefly explain working of Pirani Gauge.	04
	(c) Describe the working principle and construction of thermocouples. Describe the various types of compensation employed.	07

- Q.5 (a)** Explain the need of recorders and the draw block diagram of the digital recording system. **03**
- (b)** Write a short note on rota meter for flow measurement. **04**
- (c)** Explain ultrasonic level measurement. Also state its advantages and disadvantages. **07**

OR

- Q.5 (a)** Draw a block diagram of multi-channel data acquisition system. **03**
- (b)** Explain working of McLeod gauge. **04**
- (c)** Explain dual slope A/D circuits in digital data acquisition. **07**
