

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023****Subject Code:3141709****Date:17-07-2023****Subject Name:Principle of Measurement Science****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 active and passive transducers.	03
	(b) What is dead weight tester and why it is used?	04
	(c) Explain two wire and three wire RTD configuration in detail.	07
Q.2	(a) State the working principle of bimetallic thermometers.	03
	(b) Define threshold, sensitivity, accuracy and fidelity in measurement.	04
	(c) Discuss the working principle and the construction of LVDT with neat diagram. Explain the merits and demerits.	07
	OR	
	(c) Define Gauge factor. With neat sketch, explain the working of Strain Gauge with its application and types.	07
Q.3	(a) Explain bourdon tube pressure gauge in brief.	03
	(b) Explain the working principle of capacitive transducer.	04
	(c) Enlist the transducers which are used for low pressure measurement. Explain the working of any one in detail.	07
	OR	
Q.3	(a) Briefly explain about bellows & diaphragm.	03
	(b) Explain the working principle of Inductive transducer.	04
	(c) List out different types of displacer type level detectors. Explain Torque tube type displacer level detector in detail with diagram	07
Q.4	(a) State the advantages and disadvantages of filled system thermometers	03
	(b) Discuss the types of Level switches.	04
	(c) What is Thermocouple? Explain Cold junction compensation in Thermocouple.	07
	OR	
Q.4	(a) Differentiate between RTD and Thermistor.	03
	(b) Describe the operation of the air bubbler level measurement system.	04
	(c) Indicate the types of obstruction elements used for fluid flow measurement and comments on their relative merits for application.	07
Q.5	(a) Explain Total radiation pyrometer.	03
	(b) Explain variable area type of flowmeter.	04
	(c) Explain the principle, working, construction and application of electromagnetic flow meter.	07
	OR	
Q.5	(a) Define Seebeck and Peltier effect.	03
	(b) List out the factors to be considered for flow meter selection.	04
	(c) Explain the principle, operation and application of ultrasonic flow meter.	07