

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV(NEW) EXAMINATION – WINTER 2022****Subject Code:3141709****Date:16-12-2022****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 temperature. Convert 102°F into °K and °C.	03
(b) Define transducer and classify them in detail.	04
(c) Define following terms of performance characteristic of the instrument briefly	07
1. Fidelity	
2. Dead Zone	
3. Accuracy	
4. Speed of response	
5. Precision	
6. Threshold	
7. Repeatability	
 Q.2 (a) Define	03
1. Vacuum	
2. Atmospheric pressure	
3. Gauge pressure	
(b) Write short note on selection criteria for transducer.	04
(c) Explain linear variable differential transformer with neat sketch along with its advantages and disadvantages.	07
OR	
(c) Explain McLeod Gauge in detail with a neat sketch along with its advantages and disadvantages.	07
 Q.3 (a) Explain capacitive level measurement in brief with diagram.	03
(b) Draw and describe Ultrasonic Level sensor.	04
(c) Explain ultrasonic level measurement system in detail with a neat sketch.	07
OR	
Q.3 (a) Classify different types of direct and indirect level measurement techniques.	03
(b) Define Reynolds number. What is its role in flow calculations? How are laminar and turbulent flows distinguished by the Reynolds number?	04
(c) Explain Air Purge type liquid level measurement in detail with neat sketch.	07
 Q.4 (a) Explain principle of electromagnetic flow meter.	03
(b) Give advantages and disadvantages of Thermocouple, RTD.	04
(c) Draw and describe construction, working and limitation of 2-wire RTD based temperature measurement. How its limitation will overcome?	07

OR

- Q.4** (a) Explain different type of orifice plate for flow measurement. **03**
(b) Explain positive temperature coefficient and negative temperature coefficient with respect to different temperature sensor. **04**
(c) Explain optical pyrometer in detail with neat sketch. **07**
- Q.5** (a) Define pressure and write different units of pressure. **03**
(b) Explain U tube manometer with neat sketch along with its merits and demerits. **04**
(c) Explain Doppler and Transit time Ultrasonic meter for flow measurement th neat sketch. **07**
- OR**
- Q.5** (a) Explain in brief pirani gauge for vacuum measurement. **03**
(b) Explain pressure measurement using flapper nozzle assembly. **04**
(c) Explain ultrasonic flow meters in detail with a neat sketch. **07**
