

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2023****Subject Code:3141709****Date: 06-02-2024****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
<b>Q.1</b> (a) Define gauge pressure, absolute pressure, and differential pressure.	<b>03</b>
(b) Describe primary and secondary transducer with example.	<b>04</b>
(c) Discuss the use of thermocouples for temperature measurement and their advantages.	<b>07</b>
<b>Q.2</b> (a) Explain any three static characteristics used for industrial measurement.	<b>03</b>
(b) Explain optical pyrometer in detail.	<b>04</b>
(c) Explain Seebeck, Peltier & Thomson effects. Also explain laws of intermediate temperature.	<b>07</b>
<b>OR</b>	
(c) Draw and explain C- type Bourdon pressure gauge and its calibration method.	<b>07</b>
<b>Q.3</b> (a) Discuss the advantages and disadvantages of manometers in pressure measurement.	<b>03</b>
(b) Explain air purge level measurement with neat sketch.	<b>04</b>
(c) Describe the use of ultrasonic level sensors in non-contact level measurement.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Explain the working principle of a float-operated level switch.	<b>03</b>
(b) Explain any two elastic type pressure measuring elements.	<b>04</b>
(c) Discuss the role of capacitance level sensors in industrial level measurement.	<b>07</b>
<b>Q.4</b> (a) Explain the working principle of Thermistor.	<b>03</b>
(b) What is Flow? Explain the concept of Reynolds number.	<b>04</b>
(c) Explain the principle, working, construction and application of McLeod Vacuum gauge.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Discuss operating principle of strain gauge.	<b>03</b>
(b) Discuss RTD temperature measurement with constant current source with neat sketch, principle and working.	<b>04</b>
(c) Explain bubbler method in detail with its advantages & disadvantages.	<b>07</b>
<b>Q.5</b> (a) Explain thermopile temperature measurement.	<b>03</b>
(b) Write short note on venturi tube for flow measurement.	<b>04</b>
(c) How does a turbine flow meter function, and where is it typically used?	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) Explain inductance principle of transduction.	<b>03</b>
(b) Explain Piezo electric pressure measurement with neat diagram.	<b>04</b>
(c) Explain the working principle of a rotameter for flow measurement.	<b>07</b>

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