

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- IV EXAMINATION – SUMMER 2020****Subject Code: 3141709****Date: 28/10/2020****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.

		<b>MARKS</b>
<b>Q.1</b>	(a) Define sensor, temperature and precision.	<b>03</b>
	(b) Draw and describe functional block diagram of measurement system.	<b>04</b>
	(c) Explain with a neat figure, principle, construction, working, advantages and disadvantages of 2-wire, 3-wire and 4-wire RTD.	<b>07</b>
<b>Q.2</b>	(a) Define transducer and classify them in detail.	<b>03</b>
	(b) Explain with a neat figure, principle, construction and working of Bimetallic thermometer.	<b>04</b>
	(c) Write a short note on Air Purge/Bubbler type liquid level measurement with construction, working and diagram.	<b>07</b>
<b>OR</b>		
	(c) Describe the principle of level measurement using capacitance and show using equations how capacitance changes with level change.	<b>07</b>
<b>Q.3</b>	(a) What is the significance of dead weight of tester? Explain it with schematic diagram.	<b>03</b>
	(b) Explain principle for ultrasonic level measurement.	<b>04</b>
	(c) Explain McLeod gauge for vacuum measurement with neat diagram.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Define the vacuum pressure. Explain pirani vacuum gauge with all details.	<b>03</b>
	(b) Explain rotameter type flow meter with neat sketch.	<b>04</b>
	(c) Discuss the principle and construction of orifice plate flowmeter.	<b>07</b>
<b>Q.4</b>	(a) Discuss the basic principle of manometer.	<b>03</b>
	(b) Explain in detail thermoelectric Laws for thermocouple.	<b>04</b>
	(c) Explain with a neat the working of a flow meter used for measuring unsteady flow of gases.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) List out different displacer type level detectors. Explain torque tube type displacer level detector.	<b>03</b>
	(b) Explain doppler and transit time ultrasonic meter for flow measurement.	<b>04</b>
	(c) Explain stagnation point and working principle of pitot tube.	<b>07</b>
<b>Q.5</b>	(a) List out positive and negative metal combination for J,K,R,S,T thermocouple.	<b>03</b>
	(b) Explain working of pressure switch in detail	<b>04</b>

- (c) Explain the electromagnetic flow meter with its basic principle of operation. **07**

**OR**

- Q.5** (a) Explain flapper-nozzle assembly in detail. **03**  
(b) Explain level switch. **04**  
(c) Explain radiation pyrometer with diagram. **07**

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