

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- IV EXAMINATION – SUMMER 2020****Subject Code: 2141705****Date: 28/10/2020****Subject Name: INDUSTRIAL MEASUREMENT I****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 following terms of performance characteristic of the instrument briefly 1. Fidelity      2. Repeatability      3. Dead zone	<b>03</b>
	(b) Draw neat sketch of functional block diagram of an instrument. Explain its signal conditioning (Intermediate) block in detail.	<b>04</b>
	(c) Justify following statement “The role of transducer as prime component of any measurement system”	<b>07</b>
<b>Q.2</b>	(a) Differentiate self operated VS power operated transducers	<b>03</b>
	(b) Explain Air-Bubbler system for liquid level measurement.	<b>04</b>
	(c) Describe the working of following level measurement techniques with neat sketch. (1) RADAR (2) Ultrasonic (3) Capacitance	<b>07</b>
	<b>OR</b>	
	(c) Describe the working of following level measurement techniques with neat sketch. (1) Float (2) Displacer (3) Diff. Pressure	<b>07</b>
<b>Q.3</b>	(a) Describe low /vacuum pressure units.	<b>03</b>
	(b) What are manometers? Describe its operating principle for pressure measurement.	<b>04</b>
	(c) Explain capacitive type electrical pressure measuring system with neat sketch, working, measurement range and limitation.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Differentiates following pressure on flowing fluid. (1) Absolute Pressure ( 2) Gauge Pressure (3) Total Pressure	<b>03</b>
	(b) How will Flapper nozzle assembly is applicable as pressure controlled system? Discuss it in brief.	<b>04</b>
	(c) Draw and describe construction, working and benefit with neat sketch of Dead Weight Tester.	<b>07</b>
<b>Q.4</b>	(a) Depict available temperature scale	<b>03</b>
	(b) What are the differences between Thermistor and RTD? Describe it.	<b>04</b>
	(c) Draw and describe construction, working and limitation of 2-wire RTD based temperature measurement. How its limitation will overcome?	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Describe the laws of Thermocouples	<b>03</b>
	(b) Justify the need of temperature compensation for temperature measurement.	<b>04</b>

- (c) Draw optical pyrometer and describe its operating principle, working and limitation as a temperature measuring instrument. **07**
- Q.5** (a) Draw and describe variable area type Rotameter. **03**  
(b) Draw and describe Ultrasonic Level Switch. **04**  
(c) Draw and describe operating principle, working, construction and limitation of Electro-magnetic type Flow meter. **07**
- OR**
- Q.5** (a) Obtain Bernoulli equation for incompressible fluid. **03**  
(b) Explain working with operating principle of Venturi Tube as Flow meter. **04**  
(c) Describe Ultrasonic Flow meter. How will it best suited as non contact measurement approach? **07**

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