

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.

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

- (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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