

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2020

Subject Code:3141709

Date:17/02/2021

Subject Name:Principle of Measurement Science

Time:02:30 PM TO 04:30 PM

Total Marks:56

Instructions:

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define any three following terms of performance characteristic of the instrument briefly 1. Resolution 2. Threshold 3. Repeatability 4. Drift 5. Speed of response 6. Fidelity.	03
	(b) Define transducer and classify them in detail.	04
	(c) Explain with a neat figure, principle, construction, working, advantages and disadvantages of RTD.	07
Q.2	(a) Explain different types of pressures with units.	03
	(b) Draw and describe each block of functional block diagram for secondary measurement system.	04
	(c) Explain the need of temperature measurement in process and allied industries. Write different temperature scales with minimum and maximum range also give conversion formula for °K to R', °C, °F.	07
Q.3	(a) Draw Flapper-Nozzle assembly, Explain how it will work as pneumatic amplifier?	03
	(b) Explain air purge system for level measurement.	04
	(c) Explain the laws of thermocouple with necessary diagram and equations.	07
Q.4	(a) Obtain Bernoulli equation for incompressible fluid.	03
	(b) Explain pitot tube flow meter.	04
	(c) Explain turbine flow meter with necessary diagram.	07
Q.5	(a) Explain doppler effect with necessary equations and diagram.	03
	(b) Explain capacitance based level measurement.	04
	(c) Draw and describe level switch.	07
Q.6	(a) Explain thermal conductivity gauge for pressure measurement.	03
	(b) Explain radiation pyrometer in detail.	04
	(c) Describe with necessary diagram vortex type flow meter. List its benefits and disadvantages.	07
Q.7	(a) Explain rota meter for flow measurement with its limitation.	03
	(b) Importance of cold junction compensation & its circuits.	04
	(c) How will Electro-Magnetic principle useful for velocity of fluid flow measurement? Draw and describe with benefits and limitation of EM Flowmeter.	07
Q.8	(a) Discuss Bellows type pressure sensor and its application for the measurement of absolute and gauge pressure.	03
	(b) Describe displace type level measurement.	04
	(c) What are thermistors? How are they constructed? Draw and discuss their resistance-temperature characteristic.	07