Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2021

Subject Code:3141709 Date:07/09/2021

Subject Name:Principle of Measurement Science

Time:02:30 PM TO 05:00 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
Q.1	**(a)**	Define following terms 1) Accuracy 2) Drift 3) fidelity	**03**
	(b)	Draw and describe Pneumatic Amplifier	**04**
	(c)	How will you select best transducer to fulfill your measurement requirement? Describe it with proper technical arguments.	**07**
Q.2	**(a)**	Define 1) Absolute Pressure 2) Gauge Pressure 3) Total Pressure	**03**
	(b)	How DP Cell works for Flow measurement? Describe with neat sketch.	**04**
	(c)	Draw and describe construction, working and benefit with neat sketch of Pirani gauge for low pressure measurement.	**07**
		OR	
	(c)	Describe the principle of level measurement using ultrasonic sensor.	**07**
Q.3	**(a)**	Convert 2098 ºFahrenheit to equivalent ºKelvin, ºCelsius ºRankin and Reaumur values.	**03**
	(b)	What is RTD? Describe it briefly	**04**
	(c)	Define temperature sensitivity of K-Type thermocouple. Draw and describe working, operation and limitation of thermocouple based temperature measurement.	**07**
		OR	
Q.3	**(a)**	Obtain Bernoulli equation for incompressible fluid	**03**
	(b)	Explain Orifice flow meter.	**04**
	(c)	Describe Pitot-Tube with its construction, working, installation and limitation	**07**
Q.4	**(a)**	Draw and describe Level Switch	**03**
	(b)	Explain in detail thermoelectric Laws for thermocouple.	**04**
	(c)	Draw Flapper-Nozzle assembly. Explain how it will work as pneumatic amplifier?	**07**
		OR	
Q.4	**(a)**	Discuss with neat Sketch about Dead Weight Tester.	**03**
	(b)	Explain doppler and transit time ultrasonic meter for flow measurement.	**04**
	(c)	Explain with a neat figure, principle, construction and working of Optical pyrometer	**07**
Q.5	**(a)**	Identify any 2 flow measurement technique using time as its measurement principle. With a neat figure, state principle of any one technique	**03**
	(b)	Discuss the basic principle of manometer. Explain different types of manometers in detail	**04**
	(c)	With a neat figure, explain construction and working of turbine flowmeter	**07**
		OR	
Q.5	**(a)**	Explain the Vena Contracta & Stagnation Point.	**03**
	(b)	What is the difference between orifice transducer and venturi transducer?	**04**
	(c)	Explain air purge level measurement with neat sketch	**07**

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