Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2024

Subject Code:3151708 Date:02-12-2024

Subject Name:Measurement in industry

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Compare bonded and unbounded strain gauge. Discuss Semiconductor gauge.	**03**
	(b)	Define interferometry. Discuss Michelson Micro laser interferometer with neat diagram.	**04**
	(c)	Explain flapper-nozzle transducer for displacement measurement with its characteristic curve.	**07**
Q.2	**(a)**	Brief about following term: Hooke's law, Poisson's ratio, Shearing Strain.	**03**
	(b)	Explain Bubbler system for Density measurement.	**04**
	(c)	What is Chromatography? Classify it and explain gas chromatography in detail.	**07**
		OR	
	(c)	Discuss the principle of Digital Displacement Transducer. Draw the construction of 4-bit gray coded absolute encoder for angular displacement.	**07**
Q.3	**(a)**	Discuss Newtonian and non-Newtonian behavior of various fluids in viscosity measurement.	**03**
	(b)	Explain the piezoelectric accelerometer with neat diagram.	**04**
	(c)	Explain in detail about LVDT with necessary diagram and its application.	**07**
		OR	
Q.3	**(a)**	Define the Proximity sensor.	**03**
	(b)	Discus the principle of auger electron spectroscopy.	**04**
	(c)	Explain Optical Pulse Tachometer transducer for speed measurement.	**07**
Q.4	**(a)**	What is meant by pH? Discuss any one type of the electrode used for pH measurement	**03**
	(b)	Draw & discuss the principle of dual-beam nephelometer.	**04**
	(c)	Describe variable capacitance type transducers.	**07**
		OR	
Q.4	**(a)**	Explain Hydrometer in detail with sketch.	**03**
	(b)	Give the difference between PSD detectors (Position sensitive detector) and CCD (Charge Couple Device) detectors used in LASER transducer.	**04**
	(c)	Explain the detail of industrial weighing system.	**07**
Q.5	**(a)**	Discuss vibrating U-tube densitometer with neat diagram.	**03**
	(b)	Define relative humidity. Discuss electrolytic hygrometer with neat sketch.	**04**

	(c)	Enlist moisture measurement techniques. Explain any one moisture measurement technique used in paper and textile industry.	**07**

OR

Q.5	**(a)**	Explain Thermal Conductivity detector in detail with diagram.	**03**
	(b)	Explain the basic components of mass Spectrometer.	**04**
	(c)	Explain Infrared Analyzers in detail.	**07**

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