Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2151706 Date:20/11/2018

Subject Name:Industrial Measurement II

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)**	Draw and explain capacitive approach for displacement measurement.	**03**
	(b)	Explain Foil type and Semiconductor type Strain Gauges with diagram.	**04**
	(c)	Explain Magnetoelastic Load Cell with diagram.	**07**
Q.2	**(a)**	Explain Ostwald Viscometer in detail with neat diagram.	**03**
	(b)	Explain Thermal Conductivity detector in detail with diagram.	**04**
	(c)	Enlist different types of displacement transducers. Explain Pneumatic type displacement transducer in detail with diagram.	**07**
		OR	
	(c)	Explain Resistive Transducer for Displacement Measurement.	**07**
Q.3	**(a)**	What is Chromatography? Draw the gas chromatograph setup with all necessary labeling.	**03**
	(b)	Explain Time-of-flight method of Laser type Displacement Transducer.	**04**
	(c)	A strain Gauge with nominal resistance of 200Ω and G_f =2.0 is fixed on one flat surface of short column of 2cm × 2cm cross sectional area. The column is subjected to an axial force of 100N. The strain Gauge forms one arm of the bridge with other arms all equal to 200Ω. Find the open-circuit output of the bridge excited by 10V. Given, Young's modulus of elasticity = 2.2×10^{11} N/m^2.	**07**
		OR	
Q.3	**(a)**	Compare bonded and unbonded strain gauges.	**03**
	(b)	Discuss the factors that should be taken care while specifying an accelerometer for a particular application.	**04**
	(c)	A bridge circuit has two fixed resistors and two strain gauges all of which have a value of 120 ohms. The gauge factor is 2.04 and the strain applied to twin strain gauges, one in tension and the other in compression, is 0.000165. If the battery current in the initial balanced condition of the bridge is 50 mA, determine, 1) The voltage output of the bridge, 2) The sensitivity in volt per unit strain. If the galvanometer connected to output terminals reads 100 μV per scale division & if 1/10th of a division can be read, determine the resolution.	**07**
Q.4	**(a)**	Explain Hair Hygrometer with necessary diagram.	**03**
	(b)	Explain Proximity sensor with neat diagram.	**04**
	(c)	Explain Non-dispersive type IR analyzer with neat sketch.	**07**
		OR	

Q.4	**(a)**	Explain industrial need of pH measurement.	**03**
	(b)	Explain principle, working and construction of Optical Pulse Tachometer transducer for speed measurement.	**04**
	(c)	Explain Atomic Absorption Spectroscopy in detail with diagram.	**07**
Q.5	**(a)**	Explain Flame Ionization Detector with diagram.	**03**
	(b)	Explain Electrode method of pH measurement.	**04**
	(c)	What are the advantages of Fiber Optic Strain Gauges. Explain any one type in detail.	**07**

OR

Q.5	**(a)**	Explain Bubbler system for Density measurement.	**03**
	(b)	Define Torque. Explain Transmission type Dynamometer.	**04**
	(c)	Explain UV Visible Spectroscopy in Detail.	**07**

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