Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2170913 **Date:19/01/2021**

Subject Name:Industrial Instrumentation

Time:10:30 AM TO 12:30 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 following term. (i)Static error (ii) Mechanical Hysteresis (iii) Sensitivity	**03**
	(b)	Explain transducer and inverse transducer with suitable examples.	**04**
	(c)	Explain construction and working principle of L.V.D.T. with its characteristics.	**07**
Q.2	**(a)**	Define synchros and state its application.	**03**
	(b)	Differentiate Unbounded and bonded type strain gauge.	**04**
	(c)	Why temperature compensation is required for strain gauge? Explain any one method in detailed for temperature compensation.	**07**
Q.3	**(a)**	Explain Black Body concept for very high temperature measurements.	**03**
	(b)	Write and Explain laws of thermocouples.	**04**
	(c)	Describe with neat diagram how disappearing filament type optical pyrometer can measure very high temperature.	**07**
Q.4	**(a)**	Define following term. (i)See back effect (ii) Piezoelectric effect (iii) Piezo-resistive effect	**03**
	(b)	Explain RTD with diagram, principle, merits and demerits.	**04**
	(c)	Describe the construction, theory and working principle of thermocouples. State different types of compensations used.	**07**
Q.5	**(a)**	State different type of load cell used for force measurement and also state its advantages.	**03**
	(b)	Describe the working principle of Hall effect transducer and state its application.	**04**
	(c)	With a neat sketch explain the construction and working of Rotameter.	**07**
Q.6	**(a)**	Explain how capacitive used for Linear displacement.	**03**
	(b)	Derive output equation of Piezoelectric transducer.	**04**
	(c)	With a neat sketch explain the construction and working of Pirani gauge.	**07**

Q.7	**(a)**	Explain the need of recorders and the draw block diagram of digital recording system.	**03**
	(b)	Explain the different components of an Analog Data Acquisition System.	**04**
	(c)	Write short note on modern digital data acquisition system.	**07**
Q.8	**(a)**	Explain types of instrumentation systems.	**03**
	(b)	Explain the operation of Sample and Hold circuit in brief.	**04**
	(c)	Explain measurement of liquid level using capacitive transducer.	**07**

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