

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2170913

Date:10/05/2019

Subject Name:Industrial Instrumentation

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.

		MARKS
Q.1	(a) Differentiate between active and passive transducer with example.	03
	(b) Write the formula of Gauge Factor for resistive strain gauge. Explain how poison's ratio, dimensions and specific resistance contribute to Gage Factor.	04
	(c) Explain construction and working of optical pyrometer with its advantages and disadvantages.	07
Q.2	(a) Explain how pressure can be measured with LVDT.	03
	(b) Explain how cold junction compensation is done in thermocouple.	04
	(c) Explain how angular displacement of shaft can be measured using Hall effect principle.	07
	OR	
	(c) Explain working of four arm active Wheatstone bridge circuit employed for strain measurement considering two arms experiencing tension and other two arms experiencing compression.	07
Q.3	(a) Enlist methods of torque measurement. Explain any one of them in brief.	03
	(b) Explain how the level can be measured by air purge system.	04
	(c) Write short note on Ultrasonic flow meter.	07
	OR	
Q.3	(a) State principle of operation and construction of RTD.	03
	(b) Enlist different types of load cells. Briefly explain any one of them.	04
	(c) Write a note on Ultrasonic level detector.	07
Q.4	(a) Explain how level can be measured using capacitive principle.	03
	(b) Draw the schematic of X-Y recorder.	04
	(c) Explain optical encoder principle used for shaft speed measurement.	07
	OR	
Q.4	(a) Describe working of sample and hold circuit.	03
	(b) Briefly explain working of Pirani Gauge.	04
	(c) Write a note on modern digital data acquisition system.	07
Q.5	(a) Explain working of electromagnetic type flow meter.	03
	(b) Explain how calibration of pressure gauge is carried out.	04
	(c) Explain basic requirement of transducer system.	07
	OR	
Q.5	(a) Explain how Venturi tube used for flow measurement.	03
	(b) Briefly explain working of McLeod gauge.	04
	(c) Explain the following characteristics of a Transducer. (i) Precision (ii) Resolution (iii) Sensitivity (iv) Threshold (v) Repeatability (vi) Fidelity (vii) Drift	07
