

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2170913

Date:04-12-2024

Subject Name: Industrial Instrumentation

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.

- Q.1** (a) Define 1) Repeatability 2) Accuracy 3) Dead Zone **03**
(b) Define electrical transducer. Explain its advantages. **04**
(c) Explain construction and working principle of L.V.D.T. with its characteristics. **07**

- Q.2** (a) State and explain basic requirements of transducers. **03**
(b) Differentiate Unbonded and bonded type strain gauge. **04**
(c) What is Gauge factor? Derive the expression for Gauge factor in terms of Poisson's ratio. **07**

OR

- (c) Describe, with neat sketches, construction and working of RVDT with its characteristic, advantages and disadvantages **07**

- Q.3** (a) Define 1) gauge pressure 2) absolute pressure 3) differential pressure **03**
(b) List different types of pressure transducers commonly used in process industries. **04**
(c) Draw a neat sketch to show the essential parts of a Bourdon tube pressure gauge, state function of each part. **07**

OR

- Q.3** (a) List the steps of pressure gauge calibration **03**
(b) Define synchros and state its application. **04**
(c) Explain, with neat sketch the construction and working of Pirani gauge **07**

- Q.4** (a) Compare Thermistor with RTD. **03**
(b) What is piezoelectric transducer? Draw its equivalent circuit. **04**
(c) Explain with neat sketch, construction and working of rotameter. **07**

OR

- Q.4** (a) State principle of operation and construction of RTD. **03**
(b) Explain how level can be measured using capacitive principle. **04**
(c) Explain with neat sketch, construction and working of Ultrasonic flow meter **07**

- Q.5** (a) What is Hall effect? Enlist physical quantities those can be measured using Hall effect. **03**
(b) Describe operation of sample and hold circuit **04**
(c) Write short note on modern digital data acquisition system. **07**

OR

- Q.5** (a) Explain how Venturi tube used for flow measurement. **03**
(b) Explain the need of recorders. Differentiate strip chart and X-Y recorder. **04**
(c) Describe the working principle, construction and method of using an optical pyrometer with the help of neat sketch. **07**
