

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3151402****Date:22/01/2021****Subject Name:Food Process Instrumentation and Control****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.
4. Use pencil to draw the diagram.

Q.1 (a) Discuss Baumé scale and Twaddell scale of specific gravity measurement. **03**

(b) List out the advantages of LVDT. **04**

(c) Write down the advantages and disadvantages of rotameter and derive the following equation. **07**

$$P_1 - P_2 = \frac{v_f}{A_f} (\gamma_1 - \gamma_2)$$

Q.2 (a) Steam point having a temperature 100°C, what is the temperature at Reaumur scale. **03**

(b) With the help of diagram define Absolute Pressure, Atmospheric Pressure, Gauge Pressure and Differential Pressure. **04**

(c) What do you understand by thermocouple? Discuss Seebeck Effect, Peltier Effect and Thomson Effect. **07**

Q.3 (a) Write down the application of bimetallic strips at different conditions. **03**

(b) Differentiate between PTC and NTC with example. **04**

(c) Explain the construction and working of Platinum Resistance Thermometer. **07**

Q.4 (a) Define laminar, turbulent and transient flow with diagram. **03**

(b) What do you understand by capillary tube viscometer, explain. **04**

(c) Explain the working principle of Bubbler Method of specific gravity measurement with diagram. **07**

Q.5 (a) Discuss the classification of transducers. **03**

(b) Draw diagram only **04**

1. Rotameter type Viscometer
2. Liquid in Glass Thermometer

- Q.6** (a) Define the followings of liquid in glass thermometer **03**
1. Bulb
2. Stem
3. Contraction Chamber
- (b) Write down the advantages and disadvantages of target flow meter. **04**
- (c) Discuss the details of following indirect method of level measurement. **07**
1. Bubbler or Purge method
2. Capacitance type level gauge
- Q.7** (a) List the advantages of alcohol over mercury as a thermometric liquid. **03**
- (b) Differentiate between Bellows and Bourdon tube. **04**
- (c) Explain the principle of hydrometer for measuring the specific gravity with neat sketch. **07**
- Q.8** (a) What are the different materials of construction for orifice plate? **03**
- (b) Differentiate between Hair Hygrometer and Electrolytic Hygrometer. **04**
- (c) Discuss the working principle of bimetallic strips in temperature measurement. **07**
