(24/A-9) SEAT No._____ No. of Printed Pages : 02

SARDAR PATEL UNIVERSITY
EXTERNAL EXAMINATION
B.SC. INDUSTRIAL CHEMISTRY
(SIXTH SEMESTER)
US06CICH05: Industrial Instrumentation and Process control
WEDNESDAY, 3RD April, 2019

Time: 10:00 am to 1:00 pm **Total Marks: 70**

Q-1 Answer the following multiple choice question. **[10]**

1. Freezing point is the temperature at which the substance changes physical state and become a _____.
   a. Solid c. Plasma
   b. Gas d. Liquid
2. The temperature range covered by the industrial bimetallic thermometer is _____ ^{0}F.
   a. 40 to 80 c. -40 to 800
   b. -40 to 80 d. 40 to 800
3. Which of the following is example of radiation temperature measurement instrument?
   a. Bulb thermometer c. Radiation pyrometers
   b. Bimetallic thermometer d. All of these
4. The pressure range of bronze spring is _____ psi.
   a. 6 c. 600
   b. 0.6 d. 60
5. The simplest of the direct devices for liquid level measurement by _____.
   a. Hook type level indicator c. Bob and tape
   b. Ultrasonic d. Float type level indicator
6. Pressure below the atmospheric pressure is known as_____.
   a. Gauge pressure c. Vacuum
   b. Absolute pressure d. Force
7. An orifice is said to be large if_____.
   a. Size of orifice is large c. Available head of water is <5 time its height
   b. Available head of water is >5 time its height d. Velocity of flow is large
8. Circular plate with a hole if is _____.
   a. Rotameter c. Orifice meter
   b. Pitottube d. Venturimeter
9. Which of the following device display a store a pen and-ink record of the history of some physical event?
   a. Graphical recorder c. Control valve
   b. Control panel d. Amplifier
10. Elimination of offset can be obtained with the use of _____.
    a. Integral control c. On- off control
    b. Proportional control d. Control valve

P.T.O.

Q-2 Answer any ten of following. **[20]**

1. Define following terms:
   a. Manipulating
   b. Dead zone
2. Give the principle of thermocouple.
3. Enlist the use of thermal well.
4. What is foot and tape method?
5. Write the principle of bourdon pressure gauge.
6. Write in brief magnetic float gauge method.
7. Write the advantages of pitot tube.
8. Enlist the classification of orifice plate.
9. Write then equation of velocity of venturimeter
10. Enlist the objectives of data recorder.
11. Enlist the different device used for producing records.
12. Define the following terms:
    a. Central layout
    b. Unit layout

Q-3 a. Discuss the classification of measuring instrument. **[05]**
b. Write a note on resistance temperature detector. **[05]**

OR

Q.3 a. Discuss the mercury in glass thermometer. **[05]**
b. Write a note on construction, working, principle and advantages of thermistor. **[05]**

Q-4 Discuss the ultrasonic level detector in detail. **[10]**

OR

Q-4 With the neat diagram explain working and construction of bellow pressure gauge. **[10]**

Q-5 Write the principle, construction and working of orifice meter with merits and demerits. **[10]**

OR

Q-5 Derive an equation for following: **[10]**
1. Triangular notch
2. Pitot tube

Q-6 a. Discuss the analog and digital type indicator in detail. **[05]**
b. Write an explanatory note on circular char recorder. **[05]**

OR

Q-6 a. Write the different between circular and strip chart recorder **[05]**
b. Discuss instrumentation diagram in detail. **[05]**