

SARDAR PATEL UNIVERSITY
T.Y.B.Sc Vth Semester Examination, (under CBCS)
USO5CINS02 (Process Measurement Technique-I)

Wednesday, 24th October 2018

10.00 AM – 01.00 PM

Marks: 70

[10]

Q.1 Multiple choice questions.

- (1) The temperature scale of the ice point is _____^oK.
 (a) 273.15 (c) 273.24
 (b) 273.05 (d) 273.25
- (2) The liquid-in-glass thermometer is commonly used for the temperature range of _____^oF.
 (a) -18.4 to 608 (c) -1.84 to 608
 (b) -18.4 to 680 (d) -184 to 608
- (3) _____ is filled under pressure in the steel bulb.
 (a) Copper (c) liquid
 (b) Gas (d) mercury
- (4) 1 micron _____ mm of Hg.
 (a) 10⁻² (c) 10⁻⁴
 (b) 10⁻³ (d) 10⁻⁵
- (5) The manometric liquids used to _____ viscosity.
 (a) low (c) ultra
 (b) high (d) zero
- (6) The bourdon gauge to measure _____ pressures.
 (a) zero (c) static
 (b) differential (d) atmospheric
- (7) The diaphragms are generally fabricated form _____ material.
 (a) Cu (c) Al
 (b) Ni (d) Zn
- (8) Ionization is the process of knocking off electron from a/an _____.
 (a) electron (c) proton
 (b) atom (d) neutron
- (9) The liquid level refers to the position or height of a _____ surface above a _____ line.
 (a) liquid, solid (c) solid, datum
 (b) liquid, vapor (d) liquid, datum
- (10) The ultrasonic waves are passed through the liquid it is _____ back from the interface of two fluids.
 (a) reflected (c) reflection
 (b) reverence (d) reproduction

(P.T.O)

Q.2 Answer in short. (any Ten)

[20]

- (1) Define: Temperature with units.
- (2) Define: See beck effect.
- (3) A platinum resistance thermometer has a resistance of 340.5Ω and 300Ω at 100°C and 0°C respectively. If its resistance becomes 505.3Ω when it is in contact with a hot gas, determine the temperature of the gas. The temperature coefficient of platinum is $0.0039^{\circ}\text{C}^{-1}$.
- (4) Draw diagram for the relation between absolute, gauge and atmospheric pressure.
- (5) State the advantages of manometric liquid.
- (6) Give the advantages for Pirani gauge.
- (7) Draw the ring balance manometer.
- (8) State the limitations of thermal conductivity gauges.
- (9) State the advantages of ionization gauges.
- (10) Define: Density and unit.
- (11) Define non-electrical and electrical methods.
- (12) Draw only figure of the float and shaft type level measurements.

- Q.3 (a) Write a note on bimetallic thermometer in brief. **[06]**
- (b) State the law of intermediate temperatures and intermediate metals. **[04]**

OR

- Q.3 (a) Explain the electrical resistance thermometers with typical NTC in briefly. **[06]**
- (b) Discuss the Liquid-in-glass thermometer. **[04]**
- Q.4 (a) Derive the equation of U-tube double column manometer in brief. **[06]**
- (b) Define: Gauge and vacuum pressure. **[04]**

OR

- Q.4 (a) Discuss and derive the equation of the single-column manometer. **[06]**
- (b) State the characteristics of manometric liquid. **[04]**
- Q.5 (a) Describe the working of an Ionization gauge with the help of figure. **[06]**
- (b) Write a short note on the Bourdon Gauge. **[04]**

OR

- Q.5 (a) Discuss the Thermal Conductivity Gauge with necessary figure. **[06]**
- (b) Write a short note on McLeod gauge. **[04]**
- Q.6 Discuss and derive the expression for capacitive and ultrasonic method in brief and also they advantages and disadvantages. **[10]**

OR

- Q.6 (a) Write a note on (i) Float and shaft method (ii) Float and spring method. **[06]**
- (b) Define: Pressure method in liquid measurements. **[04]**