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# SARDAR PATEL UNIVERSITY

## T.Y.B.Sc V$^{th}$ Semester Examination, (under CBCS)

## USO5CINS02 (Process Measurement Technique-I)

## Friday, 15$^{th}$ November 2013

## 10.30 AM – 01.30 PM Marks: 70

**Q.1 Multiple choice questions.** [10]

(1) The recording is not possible with_____ thermometer.

(a) liquid-in-glass (b) filled in-system
(c) vapour-in-glass (d) thermocouple

(2) The unit of thermodynamic temperature,(Kelvin) defined as _____of the temperature of triple point of water.

(a) 1/276.16 (b) 1/267.16
(c) 1/273.16 (d) 1/278.16

(3) Which of the following type of bourdon tube shape has a small tip travel and necessitates amplification are _____.

(a) C-type (b) helical shaped
(c) spiral (d) circle

(4) The piezometer is used for measuring

(a) Gauge pressure (b) absolute pressure
(c) vacuum pressure (d) total pressure

(5) Which of the following cannot be used for negative pressure

(a) piezometer (b) pirani gauge
(c) U-tube manometer (d) bourdon gauge

(6) The capillary tubes which convert gas pressure into a mercury height. This statement is called_____.

(a) Bourdon gauge (b) McLeod gauge
(c) Pirani gauge (d) Diaphragm transducer

(7) The pressure responsive element of a bourdon gauge consists essentially of metal tube called

(a) Bourdon gauge (b) McLeod gauge
(c) Pirani gauge (d) Ionization gauge

(8) The equation of capacitive method is _____.

(a) C = K A D (b) C =D A/K (c) C = K D/A (d) C =K A/D

(9) The Thermocouple vacuum gauges to measure in the range of

(a) $10^{-4}$ to 2 torr. (b) $10^{-8}$ to 2 torr.
(c) $10^{-8}$ to 1 torr. (d) $10^{-4}$ to 1 torr.

(10) The unit of pressure is

(a) $N/m^2$ (b) $N^2/m^3$
(c) D/ cm (d) $D/cm^3$

**Q.2 Short answer types question (Any Ten)** **[20]**

(1) Draw only semiconductor resistance sensors (Thermistors).

(2) Explain: Thermocouple.

(3) One bar is equal to how many mm of Hg? Calculate it.

(4) Draw the sketch for the relation between absolute, gauge and atmospheric pressure.

(5) Define pressure units and measuring instruments.

(6) State any four characteristics of manometric liquid.

(7) Draw the block diagram of diaphragm pressure gauge.

(8) Define the advantages and limitations for pirani gauge.

(9) What is density? Define: the equation and unit.

(10) Write names of non electrical and electrical methods.

(11) Draw only figure of the float and shaft type.

**Q.3** **(a)** Describe the working of a bimetallic thermometer with the help of a figure. **[06]**

**(b)** State the law of intermediate temperatures and the law of intermediate metals. **[04]**

**OR**

**Q.3** **(a)** Explain the filled-system thermometers in briefly. **[06]**

**(b)** Write a short note on Liquid-in-glass thermometer. **[04]**

**Q.4** **(a)** What is Manometer? Derive the equation of U-tube double column manometer in brief. **[06]**

**(b)** Discuss the Ring balance manometer. **[04]**

**OR**

**Q.4** **(a)** Write in detail note of the single-column manometer. **[06]**

**(b)** Write a short note on Static and Total pressure. **[04]**

**Q.5** **(a)** Describe the working of a McLeod gauge with the help of figure. **[06]**

**(b)** Write a short note on the Ionization Gauge. **[04]**

**OR**

**Q.5** **(a)** Discuss the Thermal Conductivity Gauge with necessary figure. **[06]**

**(b)** Write a short note on Bourdon gauge. **[04]**

**Q.6** Explain the capacitive and ultrasonic method in brief and also they advantages and disadvantages. **[10]**

**OR**

**Q.6** Write a note on direct method and also discuss the air and liquid purge method of level measurement. **[10]**

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