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SEAT No. _____

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

B.Sc. Fifth semester

Instrumentation (Vocational)

US05CINV01

Process Measurement Techniques-1

Monday, 22/10/2018

Time: - 10:00AM To 1:00 PM

Marks: - 70

Q.1 Choose the correct answer (Attempt all)

(10)

- (1) What is the temperature of common salt water at freezing point?
(a) 212 °F (c) 32 °F
(b) -17.7 °F (d) 0 °F
- (2) What is the principle of operation of Bi Metallic strip type thermometer?
(a) Thermo electricity. (c) Thermal conductivity.
(b) Thermal expansion. (d) Thermal radiation.
- (3) Which of following gives best Cross temperature compensation?
(a) Vapour Filled thermometers. (c) Gas Filled thermometers.
(b) Dual Filled thermometers. (d) Liquid Filled thermometers.
- (4) Which parameter is increased when Thermocouples are connected in series?
(a) Sensitivity. (c) Accuracy.
(b) Reproducibility. (d) Repeatability.
- (5) Thermocouple made from which metals have highest temperature range?
(a) Platinum - Rhodium. (c) Copper - Iron.
(b) Nickel - Aluminum. (d) Chromium - Aluminum.
- (6) What is the temperature coefficient of RTD?
(a) Positive. (c) Negative.
(b) Zero. (d) None of above.
- (7) What is atmospheric pressure at sea level?
(a) 100mm of Hg. (c) 750mm of Hg.
(b) 760mm of Hg. (d) 777mm of Hg.
- (8) What is the principle of operation of the manometer?
(a) Hydrostatic balance. (c) Electrostatic balance.
(b) Electromagnetic balance. (d) Pneumatic balance.
- (9) What happens to the thermal conductivity in a closed chamber when the pressure in chamber reduces?
(a) Reduces. (c) Increases.
(b) Remains Constant. (d) None of above.
- (10) Which type of bourdon gauge has small tip travel?
(a) Helical. (c) Spiral.
(b) C type. (d) None of above.

Q2 Answer the following questions (Any Ten)

(20)

- (1) Define temperature and explain importance of temperature measurement.
- (2) What is the temperature of the saturated steam in °C, °R, °F and °K units?
- (3) With the typical range of operation, give the name of the liquids that can be used in filled system in glass thermometer.
- (4) Discuss the See back's experiment of the thermoelectricity and explain law of intermediate metals.

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(P.T.O.)

- (5) What is temperature coefficient? Give examples of the devices having positive and negative temperature coefficient.
- (6) List the advantages and disadvantages of Thermistor temperature sensors.
- (7) Write hydrostatic balance expression for $P_a < P_x$ for U tube manometer.
- (8) Define Atmospheric, Gauge and vacuum pressure.
- (9) Find the pressure exerted on the bottom of tank having water filled up to 1 meter height.
- (10) List the advantages and disadvantages of the Diaphragm gauge.
- (11) List the characteristics features required in materials used to prepare the Diaphragm.
- (12) Briefly explain effect of pressure on thermal conductivity of medium.
- Q3 Describe the physical quantity temp. List and discuss the various (10)
measurement scales (units) used for the temperature measurement.
- OR
- Q3 Write a note on filled system thermometer. List their advantages and (10)
disadvantages.
- Q4 What are the total radiation Pyrometers and explain its working principles (10)
and discuss its construction in detail.
- OR
- Q4 Describe the Peltier effect and Thomson effect for Thermoelectricity and (10)
also discuss construction of thermocouple probe.
- Q5 Explain various terms used in the pressure measurements and explain the (10)
method for the measurement of atmospheric pressure.
- OR
- Q5 Write a note on expanded bulb U tube manometer. (10)
- Q6 Explain the principles of operation and construction of diaphragm pressure (10)
gauge and draw the diagram of the various types of diaphragms.
- OR
- Q6 Explain the principles of operation and construction of Bellows gauge. (10)

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