Total No. of printed pages = 6

END SEMESTER EXAMINATION – 2019

Semester : 6th

Subject Code : CAI - 612

INDUSTRIAL INSTRUMENTATION

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

1. *All* questions of PART – A are compulsory.
2. Answer any *five* questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10

(a) $6666.12 N/m^2$ = _________ Torr.

(b) Ionization gauges operate on the principle of ionising the ________.

[Turn over

(c) Force is measured using ________.

(d) ________ mm of Hg is the Standard atmosphere.

(e) Kinematic viscosity is measured using ________ viscometer.

(f) The liquid in McLeod gauge is ________.

(g) Barometer is for measuring ________.

(h) The reciprocal of fluidity is ________.

(i) Stroboscope is for measuring ________ velocity.

(j) ________ is the phenomenon expressing the degree of hotness or coldness of a substance.

2. Write true or false : 1×10=10

(a) Bimetallic thermometer is made of two different metals.

(b) One Pascal is equivalent to 100 $dyne/cm^2$.

(c) Metals have positive temperature coefficient.

(d) Alcohol is a manometric liquid.

(e) The unit of viscosity is Pascal-Seconds.

(f) Pirani gauge is a gravitational type pressure gauge.

(g) In pressure head type densitometer ; the weight of a given volume of a fluid is proportional to density.

(h) Thermistor is a non-contact type thermometer.

(i) Thermopile consists of a thermocouple and a RTD.

(j) Iron Constantan is the metal alloys used to construct Type T thermocouple.

3. Choose the correct answer : 1×5=5

(a) A device which uses the indirect method for measuring low pressure is

(i) Bridgeman gauge

(ii) Manometer

(iii) Well type manometer

(iv) McLeod gauge

(b) Which thermometer is based on change in dimensions ?

(i) RTD

(ii) Thermocouple

(iii) Thermistor

(iv) Bimetallic thermometer

(c) The number of pulses generated in a photoelectric tachometer depends on the number of disc holes and ________.

(i) Sensor (ii) Light source

(iii) Shaft material (iv) Shaft speed

(d) The pressure difference in a vertical U-Tube manometer is given by

(i) gh/ρ (ii) $\rho g/h$

(iii) ρgh (iv) $h/\rho g$

(e) Which gauge uses platinum as the sensing element ?

(i) Bridgeman gauge (ii) Ionization gauge

(iii) Pirani gauge (iv) McLeod gauge.

PART – B

Marks – 45

4. (a) Define velocity and also write its SI unit. 2

(b) Explain the construction and working of any two types of accelerometers. 7

5. (a) Define density and relative viscosity. Write its unit. 4

(b) Explain the construction and working of displacer type densitometer. 5

6. (a) Define acceleration and also write its SI unit. 2

(b) Explain the construction and working of photoelectric and eddy current tachometers. 7

7. Explain the construction and working of the following :

(a) U-tube manometer 4

(b) McLeod gauge. 5

8. Explain the following :

(a) RTD 4

(b) Well type manometer 5

9. Explain the following :

(a) Rotameter type viscometer 4

(b) Dead weight tester. 5