Total No. of printed pages = 3

CAI-612/II/6th Sem/2017/N

INDUSTRIAL INSTRUMENTATION

Full Marks – 70

Time – Three hours

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

PART – A

Answer *all* questions. 2×10=20

1. An instrument used to measure atmospheric pressure is called ..... .

2. 1 Pa = ... Torr.

3. ..... is the measure of the fluidity of liquid or gas.

4. Absolute pressure = ... + gauge pressure.

5. ..... thermometers are based on the principle of difference in the coefficient of thermal expansion of different metals.

6. Specify the instrument used to calibrate static pressure above 200 kN/m^2.

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7. Specify the instrument used to measure vibrations.

8. Unit for kinematic viscosity.

9. Specify two elements used to construct RTD.

10. Write Seebeck effect.

11. Match the following : 5

(a)	Temperature	Saybolt
(b)	Pressure	Load cell
(c)	Viscosity	Strain gauge
(d)	Piezoresistive	Pyrometer
(e)	Force	Manometer

Part – B

Answer any *three* questions.

12. (a) Define the terms Relative viscosity and Specific viscosity. 2

(b) Explain resistive pressure transducer. 3

(c) Explain two methods for measuring pressure above 1000 atm. 10

13. (a) Calculate the pressure (in dyne/cm^2) exerted on a stainless steel surface of area 15m^2, if a force of 23N is applied on it. 3

(b) Explain eddy current tachometer. 5

(c) Explain the construction and working of any two types of load cell. 7

14. (a) A strain gauge is bonded to a beam of 5 cm long and has a cross-section area of 2.5m^2, modulus of elasticity of steel is 200 GN/m^2. The strain gauge has an unstrained resistance of 350Ω and gauge factor of 2. When a load is applied, the resistance of the gauge changes by 0.025Ω. Calculate

(i) Change in length of the steel beam

(ii) Amount of force applied to the beam. 6

(b) Explain the construction and working of any three types of accelerometer. 9

15. (a) Explain thermocouple and thermistor. 6

(b) Explain the construction and working of pressure head type, float type and gas bridge type densitometers. 9