

Total number of printed pages—4

53 (IE 701) IDIN

2019

## INDUSTRIAL INSTRUMENTATION

Paper : IE 701

Full Marks : 100

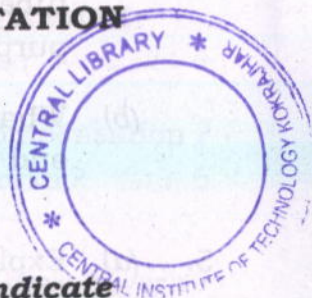
Time : Three hours

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

**Answer any ten questions.**

1. (a) How a Biometallic thermometer works? 4  
(b) How A.C. Tachogenerator works? 6
2. Write a short note on Radiation pyrometer. 10
3. (a) What is a Stroboscope? How it works? 4

Contd.



- (b) How Piezoelectric accelerometers work? 6
4. (a) Draw a sketch of C-shaped Bourdon tube pressure gauge and describe the purpose of each part. 7
- (b) What are the types of Bourdon tube and their uses? 3
5. (a) Explain the working principle of Pirani gauge. 6
- (b) Write the equation of gauge factor. 4
6. (a) Name four types of thermocouple and their descriptions. 4
- (b) Explain temperature measurement using 3-wires RTD using Wheatstone Bridge Circuit. 6
7. (a) What are the different types of manometers? Which one is of better sensitivity? 4
- (b) If Pt 100 is used for measurement of temperature then at what temperature its resistance is 120 ohm?  $\alpha = 0.0038 \text{ ohm/ohm/}^\circ\text{C}$ . 6
8. (a) How thermocouple works? 4
- (b) What is Cold-Junction Compensation? How isothermal block works? 6
9. (a) What is thermistor? How does it work? 4
- (b) For a thermistor  $\beta = 3140\text{K}$  and the resistance at  $37^\circ\text{C}$  is known to be  $1050\Omega$ . The thermistor resistance measured is as  $2330\Omega$ . Find the temperature. 6
10. (a) What is Revolution Counter? 4
- (b) A strain gauge has a gauge factor of 2.8. If it is stretched from 20cm to 21cm, what is the percentage change in resistance? 6



11. Explain the operating principle of McLeod gauge with a diagram. What is the measuring range and accuracy of McLeod gauge? 10
12. Draw complete LVDT circuit with Phase-sensitive demodulation. 10

