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Question Paper Code : 33451

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fifth Semester

Electronics and Instrumentation Engineering

EI 1301/EI 1352/070300018 — INDUSTRIAL INSTRUMENTATION — I

(Common to Instrumentation and Control Engineering)

(Regulation 2004/2007)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A variable reluctance type tachometer has 60 rotor teeth. The counter records 3600 counts per seconds. Determine the speed in r.p.m.
2. Write the expression for the shaft speed in shaft speed measurement using stroboscope.
3. Define absolute viscosity and kinematic viscosity.
4. What is the principle of operation of float type densitometer?
5. List the transducers used for measuring low pressure.
6. State thermo-electric laws.
7. Give different types of filled in system thermometer.
8. What are the materials used for constructing resistance thermometer and write their temperature ranges?
9. State the thermo-electric laws.
10. What is Isothermal reference junction block?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the method of measuring force using strain gauge load cell. (8)
- (ii) Explain how is torque measured using an optical torsion meter. (8)

Or

- (b) Explain the construction and working of
- (i) Revolution counter. (8)
- (ii) Stroboscope. (8)
12. (a) Describe the working of LVDT type and piezoelectric type accelerometers used for measurement of acceleration. Write their advantages and disadvantages. (8 + 8)

Or

- (b) Explain the working and construction of :
- (i) Pressure head type densitometer. (8)
- (ii) Say bolt viscometer. (8)
13. (a) Explain the principle of operation of various types of manometer with their advantages and limitations. (16)

Or

- (b) Explain the methods of pressure measurement using resistive type pressure transducer. (16)
14. (a) Write short notes on the following :
- (i) Calibration of thermometer. (8)
- (ii) Sources of errors in filled in system thermometer. (8)

Or

- (b) Write short notes on the following :
- (i) Signal conditioning of RTDs. (6)
- (ii) Three lead and four lead RTDs. (10)

15. (a) With neat sketches describe the construction and principle of operation of selective and two colour radiation pyrometers used for measurement of high temperature. (16)

Or

- (b) (i) Mention the laws of thermocouple. (4)
- (ii) Explain the following :
- (1) Thermowell. (4)
- (2) Thermopile. (4)
- (3) Dynamic response of thermocouple. (4)
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