Reg. No. | | | | | | | | | | | | |

Question Paper Code : 60527

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fourth Semester

Electronics and Instrumentation Engineering

EI 2251/EI 41/EI 1251/10133 EI 402/080300009 — INDUSTRIAL INSTRUMENTATION —I

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the applications of load cell?

2. What is the principle of DC tachogenerator?

3. A piezoelectric type accelerometer has a sensitivity of 100 mV/g. The transducer is subjected to a constant acceleration of 5g. Find the steady output of the tranducer.

4. What is Baume and API scale?

5. What is the principle of load cell?

6. List out the different types of manometer.

7. Draw the V—I characteristics of thermistor.

8. What are the advantages of RTD?

9. What are the fabrication methods of thermocouples?

10. State the selective radiation pyrometery principle.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the construction and principle of magneto elastic and magnetio elastic and piezo electric load cell with relevant diagram. (16)

Or

(b) Explain the following with necessary diagram

(i) Stroboscope

(ii) Ac tachogenerator. (16)

12. (a) Explain the construction and working principles of

(i) Ultrasonic densitometer. (8)

(ii) Variable reluctance type accelerometer. (8)

Or

(b) Draw the schematic diagram of seismic transducer and explain its operation both in the displacement mode and acceleration mode. (16)

13. (a) Describe the principle and construction of LVDT with a neat sketch and mention the characteristics, merits and application. (16)

Or

(b) Explain the pressure measurement using the following:

(i) Bourdon tube (6)

(ii) Bellours (5)

(iii) Diaphragm. (5)

14. (a) (i) Draw the schematic diagram for connection of a 3-wire and a 4-wire RTD. And discuss its advantages over a 2-wire RTD. (8)

(ii) What are thermistors? Discuss its resistance-temperature characteristics. (8)

Or

(b) (i) With a neat diagram explain the working of vapour pressure thermometer. (6)

(ii) A bimetallic strip made of two elements of equal length 58 mm and thickness 1 mm each are bonded at a temperature of 22°C. If their modulus of elasticity are 1.3×10^6 kgf/cm^2 and 2.2×10^6 kgf/cm^2 and coefficients of thermal expansion are 1.25×10^{-6}/°C and 12.50×10^{-6}/°C, what may be the

(1) Radius of curvature and (2) Tip deflection when the temperature is raised to 220°C? (6)

(iii) What are the possible sources of errors in filled system thermometer? (4)

15. (a) (i) State the basic laws of thermocouple.

(ii) What are the special techniques adopted for measuring high temperature using thermocouples?

Or

(b) (i) Elaborate how the fiber optic temperature measurement is advantageous than other methods. (8)

(ii) Describe the principle of two color radiation pyrometers. (8)
