

B.E. DEGREE EXAMINATIONS: NOV / DEC 2010

Fifth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U07EI501: Industrial Instrumentation - I

Time: Three Hours

Maximum marks: 100

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. The Strain gages used in the measurement of Force are made up of _____.
a) Foil type metal. b) Wire type. c) Coil type metal. d) All the above.
2. Equal Arm balance may be used for measuring _____ against a known mass.
a) Torque b) Speed c) Force d) Power
3. A tachometer encoder can be used for measurement of displacement
a) In both the directions. b) In one direction only.
c) Its output pulses are counted only for the forward direction.
d) Its output pulses are counted only for the reverse direction.
4. Revolution Counter is used for the measurement of _____.
a) Displacement b) Speed c) Acceleration d) Velocity.
5. Density of a substance is defined as _____.
a) Volume of the substance b) Mass per unit volume
c) Mass per unit volume at fixed conditions d) None of the above
6. The difference between gauge pressure and absolute pressure is _____.
a) Vacuum. b) 0.433 psia. c) Atmospheric Pressure. d) Zero Pressure
7. Which gauge measures pressure by sensing changes in the thermal conductivity of a gas?
a) Pirani Gauge b) McLeod Gauge c) Ionization Gauge d) None of these.
8. The Resistance temperature detector has a _____ temperature co-efficient.
a) Negative b) Positive c) very large negatives d) None of these.
9. Which Thermocouple material can be used for measurement of temperatures above 1000° C?
a) Copper- Constantan b) Silver- Constantan c) Alumel- Constantan d) Iron – Constantan
10. Radiation Pyrometers are used in the temperature range of _____.
a) 0-500° C b) 500-1000° C c) -250-500° C d) 1200-2500° C

PART B (10 x 2 = 20 Marks)

11. List the different types of strain gauge.

12. Define the principle of operation revolution counter?
13. Write the classification of calibration methods vibration pickups.
14. Define the viscosity of a liquid?
15. Write the operation of capacitive type pressure.
16. Name the various types elastic type pressure gauge.
17. List the advantage of resistance thermometers.
18. Mention the two primary fixed points.
19. Explain the working principle of optical pyrometer.
20. Specify the metals in J-type thermo couple.

PART B (5 x 14 = 70 Marks)

21. a) Explain the strain gauge torque measurement system with neat diagram?

(OR)

- b) List the various types of speed measurement technique. Discuss any two methods of the speed measurement with neat sketch.

22. a) Explain the principle and operation of pressure head type densitometer?

(OR)

- b) Explain the absolute motion measuring instrument with neat diagram?

23. a) Explain the operation of pirani gauge low pressure measurement?

(OR)

- b) Explain the testing and calibration of pressure gauge using dead weight tester?

24. a) Write a note on

(i) Mercury in steel thermometer. (7)

(ii) Bimetallic thermometer. (7)

(OR)

- b) Explain the three and four wire RTDs in temperature measurement system?

25. a) Explain the cold junction compensation signal condition of thermocouple?

(OR)

- b) Discuss the radiation methods of temperature measurement and explain the operation of optical pyrometer.
