KUMARAGURU
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Register Number: ………………..

B.E DEGREE EXAMINATIONS:MAY 2015

(Regulation 2009)

Fifth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EIE104: Industrial Instrumentation-I

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Pneumatic load cells work on the principle of

   a) Villari effect
   b) Wiedmann law
   c) force-balance
   d) pressduction

2. An in line rotating torque sensor produces _____ output per volt excitation.

   a) 1.5 to 2 mV
   b) 1 to 4mV
   c) 3 to 5mV
   d) 2.5 to 4.5mV

3. An accelerometer that can be used for jerk or shock measurement

   a) Strain gauge
   b) piezoelectric
   c) potentiometric
   d) variable resistance

4. The API value of a fluid is high if

   a) density is low
   b) density is high
   c) temperature is low
   d) temperature is high

5. Match List I(type of hygrometer) with List II(related process/material) and select correct answer codes

List I	List II
P –Resistive hygrometer	1. Change in frequency
Q – piezoelectric hygrometer	2. Exchange of energy
R – Heat of adsorption hygrometer	3. Lithium Chloride crystal

   a) P-1, Q-2, R-3
   b) P-3, Q-1, R-2
   c) P-1,Q-3, R-2
   d) P-3, Q-2, R-1

6. In SI system the unit of absolute viscosity is
   a) centipoise
   b) N-sec/m^2
   c) Stokes
   d) centistokes

7. Thermistors are made of
   a) Pure metals
   b) Pure insulators
   c) Sintered mixtures of metallic
   d) Pure semiconductor

8. Which of the following is most linear
   a) IC temperature sensor
   b) RTD
   c) Thermocouple
   d) Thermistor

9. Thermocouples are
   a) Active transducers
   b) Passive transducers
   c) Output transducers
   d) Both (a) and (b)

10. Radiation pyrometers are used for the range of
    a) -200°C to 500°C
    b) 0°C to 500°C
    c) 500°C to 1200°C
    d) 1200°C to 3500°C

PART B (10 x 2 = 20 Marks)

11. State the principle of working of a capacitive tachometer.

12. What are the disadvantages of a hydraulic load cell?

13. Give one method of calibration of vibration pickups.

14. Define specific gravity.

15. What are Newtonian and Non- Newtonian Fluids?

16. List out any two limitations of an electrolytic hygrometer.

17. Mention a few features of materials used to make RTDs.

18. Define primary and secondary fixed points and their significance.

19. State any two laws of thermocouples.

20. Name any 4 radiation receiving elements.

PART C (5 x 14 = 70 Marks)

21. a) (i) Describe a strobotron? How can it be used to measure speed of a rotating shaft? (8)

    (ii) Explain working of a proximity sensor to measure torque. (6)

(OR)

b) Compare the construction and working of a strain gauge load cell and magnetoelastic load cell.

22. a) Distinguish between the working of an LVDT, piezoelectric and strain gauge accelerometer.

(OR)

b) Explain with neat sketches how density can be measured using the pressure head and float type densitometers.

23. a) (i) Elaborate on the construction and working of a Saybolt viscometer. (10)

(ii) What is a dew cell? Mention its feature. (4)

(OR)

b) (i) With necessary diagrams show how moisture content in grains can be detected. (10)

(ii) What is an impedance hygrometer? List it uses. (4)

24. a) Describe the various types of filled in system thermometers, their errors and compensation.

(OR)

b) Discuss the disadvantage of a two lead RTD and methods to overcome it.

25. a) Illustrate the various methods of cold junction compensation in thermocouples.

(OR)

b) Explain the working of an optical and two colour radiation pyrometer.

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