KUMARAGURU
college of technology
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Register Number:……

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(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. Ideal Strain gauge must be of

   a) in significant mass b) In significant resistance

   c) in Significant force d) in Significant weight

2. Direction of rotating speed could be measured using

   a) AC tachometer b) DC tachometer

   c) Centrifugal meter d) Ignition type tachometer

3. Weight per unit volume is

   a) Density b) Gravity

   c) Mass d) Acceleration

4. Specific Gravity of water at 15.5°C is

   a) 10°C b) 100°C

   c) 1°C d) 0.1°C

5. Percent moisture regain is given as _____ if W denotes weight of material before drying & D denotes weight of material after drying

   a) (W+D)/D % b) D)/ (W+D)%

   c) D)/ (W-D)% d) (W-D)/D %

6. Stokes' Law is written as ____ if F_d is the drag force of the fluid on a sphere, m is the fluid viscosity, V is the velocity of the sphere relative to the fluid, and d is the diameter of the sphere

   a) $F_d = 6\pi\mu/Vd$ b) $F_d = 6\pi\mu V/d$

   c) $F_d = 6/\pi\mu Vd$ d) $F_d = 6\pi\mu Vd$

7. Platinum Resistance thermometer is used to measure a temperature range of

a) 30°C - 40°C b) 3°C - 4°C

c) 3000°C - 4000°C d) 300°C - 400°C

8. Reference junction compensation in a thermocouple is meant for

a) high accuracy b) High resolution

c) High precision d) High span

9. In an optical pyrometer white colour indicates temperature range of

a) 1.205°C b) 12.05°C

c) 120.5°C d) 1205°C

10. The PYRO Optical pyrometer is calibrated at an effective wavelength of

a) 65.5µm b) 655µm

c) 0.655µm d) 6.55µm

PART B (10 x 2 = 20 Marks)

11. On what principle does the load cell works?

12. Why stroboscope tachometer couldn't be used where the ambience is very bright?

13. Why vibration measurement is necessary? Justify with any 1 application.

14. In what manner is calibration of accelerometer performed?

15. What is the significance of Reynold's number?

16. How humidity is measured in paper/ textile industries?

17. Why is signal conditioning unit necessary in measurement?

18. Differentiate positive & negative temperature coefficient RTD.

19. What are the three types of Thermoelectric effect?

20. Is Calorimeter Pyrometer measurement of temperature Contact / Contactless type? Justify.

PART C (5 x 14 = 70 Marks)

21. a) How do the strain gauge resistance changes with respect to the stress employed on it? Elaborate on its different types of arrangement.

(OR)

b) Differentiate Capacitive type & Drag cup type tachometer with respect to its configuration and application.

22. a) How the density of LPG is measured using Bridge type gas densitometer? State its pros and cons.

(OR)

b) What is LVDT? Explain the principle, working and application of the same.

23. a) How is viscosity measured using Rotameter? Illustrate with principle using necessary diagrams. Also list the industrial applications.

(OR)

b) What apparatus could be employed for Humidity measurement based on
(i) Thermodynamic equilibrium (ii) Condensation. Explain with a neat sketch.

24. a) How a Bimetallic thermometer could be used for measuring temperature? Comment on its selection of alloys and the arrangement.

(OR)

b) On what factors does the calibration of temperature performed? Elaborate.

25. a) Where is radiation pyrometer preferred to use? What are the precautionary measures to be adopted?

(OR)

b) How is an optical pyrometer used for temperature measurement? Comment on its application.

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