Register Number:……………………..

B.E DEGREE EXAMINATIONS: NOV / DEC 2014

(Regulation 2009)

Sixth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EIE 109: Industrial Instrumentation - II

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Vacuum pressure is

   a) Equal to gauge pressure
   b) Equal to atmospheric pressure
   c) Lower than atmospheric pressure
   d) Equal to absolute pressure

2. Dead weight tester is used for

   a) testing dead weights
   b) producing high pressures
   c) calibrating pressure instruments
   d) measuring process pressures

3. The Reynolds number for flow in a pipe is given by

   a) $vd\mu/\rho$
   b) $vd\rho/\mu$
   c) $vd/\rho\mu$
   d) $v\rho\mu/d$

4. In variable head flow meters, velocity of flowing liquid is

   a) directly proportional to density of flowing liquid
   b) inversely proportional to density of flowing liquid
   c) Inversely proportional to cross sectional area of pipe through which fluid is flowing
   d) None of the above

5. Rotameter is a

   a) Variable head flow meter
   b) Variable area flow meter
   c) Drag force flow meter
   d) Propeller type flow meter

6. A flow meter that measures flow rates which are independent of density is

   a) Rotameter
   b) Venturimeter
   c) Orificemeter
   d) Electromagnetic flowmeter

7. A laser doppler anemometer can function properly only if the fluid

   a) Contains small tracer particles
   b) Contain large concentration of tracer particles
   c) Contains no tracer particles
   d) None of the above

8. Solid flow measurement is done by

   a) Dynamic weighing
   b) Ultrasonic method
   c) Electromagnetic method
   d) None of the above

9. In gas purge systems measuring liquid level in closed tanks, height is proportional to

   a) Differential pressure
   b) Pressure of gas applied
   c) Pressure inside the tank
   d) Atmospheric pressure

10. Hydrostatic pressure type level indicator is

   a) Direct method of liquid measurement
   b) Indirect method of level measurement
   c) Non contact type of level measurement
   d) None of the above

PART B (10 x 2 = 20 Marks)

11. A McLeod gauge is available with bulb and measuring capillary volume of 150×10^6 mm^3 and a capillary of diameter 0.3mm. Calculate the gauge reading for a pressure of 30μm.

12. Define static and dynamic pressure.

13. Define Bernoulli's theorem.

14. List the different pressure tapings in orifice.

15. Classify positive displacement flow meters.

16. Illustrate the working principle of coriolis flow meter.

17. Summarize the factors to be considered for the selection of flow meters?

18. State the working principle of vortex shedding flow meter.

19. List non-contact types of level measurement systems.

20. What are the different types of direct methods of liquid level measurement?

PART C (5 x 14 = 70 Marks)

21. a) Describe the principle of working of ionization gauges. Describe how vacuum can be measured by using them. List their advantages and disadvantages.

    (OR)

    b) (i) Explain the construction of a U tube manometer and explain how it can be used for measurement of absolute, gauge and differential pressure. (7)

    (ii) Describe the construction and working of C- type bourdon tube. (7)

22. a)   Discuss the construction and working of venturimeter. Derive the expression for actual flow rate.

(OR)

b)   Discuss the installation of head flow meters and piping arrangement for different fluids with neat diagrams.

23. a)   Choose any type of flow meter effectively used in aerospace and airborne applications for energy fuel and cryogenic flow measurements and discuss in detail.

(OR)

b)   Discuss the construction and working of thermal flow meters with neat sketches.

24. a)   Explain the types of ultrasonic flow meters with neat diagrams.

(OR)

b) (i) With neat sketch, explain the working of Electromagnetic flow meter. Discuss the excitation schemes used in it.

25. a)   Explain how boiler drum level is measured using hydra step system with a neat diagram.

(OR)

b) (i) With the neat sketch, explain any one type of level measurement by electrical method.   (7)

    (ii) Explain the construction and working principle of Displacer and Torque Tube type level measurement   (7)

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