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**Reg. No. :**

**Question Paper Code:45061**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fifth Semester

Instrumentation and Control Engineering

14UIC501-INDUSTRIAL INSTRUMENTATION II

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. An example of a variable area device for measuring flow is

 (a) Flow Nozzle (b) Orifice meter (c) Venturimeter (d) Rotameter

2. Which type of orifice is not suitable for liquid and gas bubbles contain solid particles?

(a) Concentric (b)Eccentric (c)segmental (d) Quadrant

3. Turbine meters are generally preferred for

 (a)Low-viscosity and high flow measurements

 (b)High viscosity and low flow measurements

 (c) High viscosity and high flow measurements

 (d) Low viscosity and low flow measurements

4. The torque on the turbine in mass flow meter is

 (a) T = r2ωG (b) T = r2ω2G (c) T = r2ωG2 (d) T = r2ω2G2

5. Conveyor-based methods are used for the measurement of the flow of

 (a)Solids (b) Conductive liquids(c) Gas(d) Non-conductive liquids

6. A flow meter that is independent of fluid density

 (a)Rotameter (b) Electromagnetic flow meters (c) Venturi meter (d) Orifice

7. Ultrasonic level measurement is not suitable for

 (a)Liquids (b) slurries (c)granular (d) interfaces

8. In nuclear radiation method of level measurement, the equation governing detector output

 is

 (a)  (b)

 (c) (d) 

9.The relative humidity of air at atmospheric pressure if the partial pressure of water vapour and saturation pressure are 30 mm Hg and 60 mm Hg is

 (a) 50% (b) 33.3 % (c) 20 % (d) 40 %

10. Rotameters are generally applicable for

(a) Tar (b) Chemical liquors (c) High viscous fluids (d) Low viscosity fluids

PART - B (5 x 2 = 10 Marks)

11. Define Stagnation point in pitot tube.

12. List any two disadvantages of magnetic flow meters.

13. How is the mass flow rate determined?

14. Mention the advantages of displacer level instrument.

15. Differentiate absolute viscosity and kinematic viscosity.

PART - C (5 x 16 = 80 Marks)

16. (a) Illustrate with suitable diagrams the construction and working of various types of orifice. What are the advantages and disadvantages of orifice plate. (16)

Or

 (b)Discuss in detail the installation and piping arrangements of different fluids in head

 flow meters.. (16)

17. (a) Explain with necessary equations and sketch the principle of operation of the

 rotameter. (16)

Or

(b) What is Coriolis principle? How this principle is used for steam flow measurement? What are the limitations of this method. (16)

18. (a) Explain the working principle and construction of electromagnetic flow meter with

 neat sketch.. (16)

Or

(b) What is vortex shedding? Explain with a neat constructional diagram how vortex shedding flow meters operates? Mention their advantages and disadvantages. (16)

19. (a) Discuss electrical methods of level measurement with suitable diagram. (16) Or

(b) Why boiler drum level has to be measured? Illustrate with neat sketches the constructional and operational details of boiler drum level measurement. (16)

20. (a) Define viscosity. How viscosity is measured using a rotameter type viscometer?(16) Or

 (b) Explain briefly about moisture measurement of various substances. (16)