Reg. No. : | | | | | | | | | | |

Question Paper Code: 41651

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fifth Semester

Instrumentation and Control Engineering

14UIC501 - INDUSTRIAL INSTRUMENTATION II

(Regulation 2014)

(Common to Electronics and Instrumentation Engineering)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The device which is used for making temporary measurements of flow is

   (a) Venturi (b) Dull flow tube
   (c) Orifice plate (d) Pitot static tube

2. For the measurement of flow, the cheapest device is

   (a) Venturi (b) Dall flow tube
   (c) Flow nozzle (d) Pitot static tube

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. Which of the following flow meter maintains a constant pressure differential but varies the orifice area with flow

   (a) Turbine flow meter (b) Target flow meter
   (c) Rotameter (d) Pitot tube

5. The flow meter which is replacing the differential pressure meters in its applications is

(a) Vortex-shedding flow meters
(b) Electromagnetic flow meters
(c) Ultrasonic flow meters
(d) Doppler flow meters

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

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

7. In ultrasonic level gauge, the ultrasonic source is placed at the

(a) Bottom of the vessel containing the liquid
(b) Top of the vessel containing the liquid
(c) Middle of the vessel containing the liquid
(d) Far from the vessel containing the liquid

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

(a) $I = I_0 \exp(-\alpha d)$
(b) $I = I_0 \exp(\alpha d)$
(c) $I = I_0 \exp(-\alpha / d)$
(d) $I = I_0 \exp(\alpha / d)$

9. Which property measures the resistance of a liquid to flow?

(a) Density
(b) Viscosity
(c) Volume
(d) Solubility

10. Which instrument is used to measure atmospheric humidity?

(a) Tintometer
(b) Tachometer
(c) Hygrometer
(d) Thermometer

PART - B (5 x 2 = 10 Marks)

11. Define Stagnation point in pitot tube.

12. List the different types of positive displacement flow meters.

13. Give the principle of vortex shedding flow meter.

14. Write short notes on displacer liquid level measurement system.

15. What are the different types of hygrometer?

PART - C (5 x 16 = 80 Marks)

16. (a) Describe with neat sketch the construction and working of variable head type flow meter. Also, derive an expression for incompressible fluids. (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) Describe about the thermal mass flow meters with neat sketch. (16)

18. (a) Explain the working principle and construction of electromagnetic flow meter with neat sketch. (16)

Or

(b) Explain about solid flow measurements. (16)

19. (a) (i) Explain the use of displacer in the measurement of level. (8)

(ii) Explain the ultrasonic method of level measurement along with the merits and demerits. (8)

Or

(b) (i) Describe the construction and working principle of capacitance type level gauge. (8)

(ii) Describe how nuclear level instruments provide point and continuous level measurement. (8)

20. (a) Explain in detail about commercial type dew point meter and rotameter type viscometer with a neat sketch. (16)

Or

(b) Explain in detail about dry and wet bulb psychrometer. (16)

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