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Question Paper Code : 60533

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Electronics and Instrumentation Engineering

EI 2303/EI 53/10133 EI 506 — INDUSTRIAL INSTRUMENTATION – II

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Name three types of rate of flow meters.
2. What do you mean by turbulent flow?
3. What are the different types of mass flow meter?
4. List the disadvantages of turbine flow meter.
5. Write the working principle of target flowmeter.
6. A vortex shedding flow meter is mounted in a pipe line of 100 mm diameter. The bluff body is a rectangle of width 40 mm and the strauhal number is 0.18 while k is 1.5. If the vortex shedding frequency is 20 Hz. What, is the volume flow rate?
7. What is DPT (Differential pressure transmitter)?
8. State the principle of float type level gauge.
9. What are the industrial needs which make viscosity determination desirable?
10. Mention the factors which should be considered as possible sources of error in humidity measurements.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With a neat diagram explain the working principle and construction of orifice meter. (8)
- (ii) Water is flowing through a venturi having 40 mm throat diameter. If 1200 kg of water flows in two minutes and the discharge coefficient is 0.95, What will be the pressure head on a mercury manometer connected to the venturi? Density of water is 1000 kg/m³ and mercury is 13600 kg/m³. (8)

Or

- (b) (i) Explain the installation of venturimeter. (6)
- (ii) With a neat schematic diagram explain the construction and working of Pitot tube. (6)
- (iii) Determine the flow velocity of water of density 1000 kg/m³ at the head of a Pitot tube if it produces a pressure differential of 10 kPa between the outlets and if the same pressure differential is obtained in air at an altitude where the density of air is 0.650 kg/m³, determine the velocity of air flow. (4)
12. (a) What are mechanical flow meters and how many groups are they divided. explain any one positive displacement meter for flow measurement? (16)

Or

- (b) (i) Explain the construction and working of Thermal mass flow meter. (8)
- (ii) What are the steps to be followed during calibration of flow meter? (8)
13. (a) Describe the construction and working of vortex shedding flow meter and target flow meter. (16)

Or

- (b) (i) With necessary diagram, Explain the construction and working of Electro magnetic flow meter. (8)
- (ii) Describe any one method to measure the flow rate of solids with neat, sketch. (8)
14. (a) Explain the principle of operation air purge level measuring system with neat diagram.

Or

- (b) Explain the ultrasonic type level measurement system.