Total number of printed pages: 02 **D/6/DIE601**

2025

INDUSTRIAL INSTRUMENTATION-II

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

Part-A: Answer all questions

1. a) …….. is trapped in the diaphragm box of a diaphragm type level measurement system.
   b) Pascal-second is the unit of ……
   c) In the float type level measurement system, the float is usually made of .....
   d) …… is the ratio of absolute viscosity of the fluid at a temperature to the absolute viscosity of a standard fluid at 20^{o}C.
   e) Humidity is measured using ……
   f) A transparent glass tube is used in ……. type of level measuring instrument.
   g) The bubbler type level measurement system uses..... gas in it.
   h) The unit of …… is m^3/s.
   i) ..... type of level measurement system is only used for conductive liquid level measurement.
   j) ..... type level measurement system uses gamma rays for level measurements.
   k.) Rotameter is a variable …… flow meter.
   l.) Float type densitometer uses different ……. floats in it.
   m.) ……. is the product of the flow average velocity and cross section area of the pipe.
   n.) In the diaphragm type level measurement system, the diaphragm is made of.....
   o.) Fluidity is the reciprocal of ……
   p.) ……. transducer is used in ultrasonic flow meters.
   q.) ……. is the moisture content in gas.
   r.) ..... is expressed in terms of length of the liquid column.
   t.) Saybolt number is the …… taken to drain 60cc of liquid through capillary.
   s.) …… is the unit of mass flow rate. 1*20=20

2. a.) Define kinematic viscosity. Specify its SI unit. 2

b.) The static calibration of resistive type level measurement system is shown in the Table 1. Calculate the sensitivity of the system.

Table1: Resistive type level measurement system's static calibration.

Level (cm)	1	2	3	4	5
Current (mA)	0.5	2	3.5	5	6.5

3

Part-B: Answer any three questions

3. a) Explain the construction and working of any two constant area-variable pressure drop flow meters. 14

b) Explain the construction and working of any two methods for solid level measurement. 11

4. Explain the construction and working of the following:
   a.) Float Type Level Measurement System
   b.) Hot Wire Gas Bridge Type Densitometer
   c.) Rotameter
   d.) Electromagnetic Flow Meter

5+6+7+7= 25

5. a) Explain the construction and working of any two densitometer used for liquid density measurement. 14

b) Explain the construction and working of any two indirect methods for liquid level measurement. 11

6. Explain the construction and working of an instrument used for measuring the following:
   a.) Kinematic Viscosity
   b.) Relative Viscosity
   c.) Volumetric Flow Rate
   d.) Liquid Level

5+6+7+7= 25

…….