

(3 Hours)



- N.B:** 1. Question No. 1 is Compulsory.
2. Attempt **any Three** from the remaining questions.
3. Assume suitable data wherever necessary.
4. Figure to right indicate full marks.

1. Attempt **any Four** questions- (20)
 - a) Derive the equation for gauge factor in strain gauge.
 - b) Compare Orifice and Venturimeter.
 - c) State the materials and their properties of-
 - i) elastic element
 - ii) Piezoelectric transducer .
 - d) Explain any one method for Torque measurement.
 - e) Explain how PH meter is calibrated.
2. a) A rotameter is calibrated for metering a liquid density of 1000 kg/m^3 and a flow range scale ranging from 1 to 100 liters/meter. It is intended to use this meter for measuring the flow of gas of density 1.25 kg/cm^3 with a flow range of 20 to 2000 lit/min. Determine the density of new float, if the original one has a density of 2000 kg/m^3 . The shape and volume of both float assume to be same. (10)
 - b) Explain the construction and working of Electromagnetic flow meter. State its advantages and limitations. (10)
3. a) Explain with diagram conductivity measurement set up . (10)
 - b) An orifice meter with orifice diameter 15 cm is inserted in a pipe of 30 cm diameter. The pressure difference measured by a mercury oil differential manometer on the two sides of manometer gives the reading of 50 cm of mercury. Find the rate of flow of oil of specific gravity 0.9 when the coefficient of discharge of meter is 0.64. (10)
4. a) Explain construction and working of Dead weight pressure gauge tester. (10)
 - b) Draw and explain pressure measurement using Bourden tube and LVDT. (10)
5. a) Explain working of variable area type flowmeter. (10)
 - b) A resistance strain gauge with a gauge factor of 2 is cemented to a steel member, which is subjected to a strain of 1×10^{-10} . If the original resistance value of gauge is 130Ω , Calculate output voltage if half bridge and quarter bridge is used. Assume current through the gauge is 25 mA. (10)
6. Write a short note on- (20)
 - a) Hot wire Anemometer.
 - b) Force balance type pressure measurement.
 - c) Mc lead gauge.
 - d) Capillary tube viscometer.