S.E.(Instrumentation Engineering)(SEM-IV)(Choice Based) / Dec. 2019 / 09.12.2019

[Time: Three Hours]   [Marks:80]

N.B: 1. Question.No.1 is compulsory.
         2. Attempt any three questions from remaining five questions.
         3. Assume suitable data wherever necessary.

1.   Attempt the following   20
  a. Derive Bernoulli's Equation.
  b. What is Vacuum? Why is it called negative pressure? List the different Vacuum
     measurement techniques.
  c. Explain Capillary Tube Viscometer.
  d. How pH meter is calibrated?

2. a. Explain with neat diagram working of McLeod Gauge.   10
   b. An orifice meter with orifice diameter 15 cm is inserted in a pipe of 30 cm diameter.   10
      The pressure difference measured by a mercury oil differential manometer on the
      two sides of the orifice meter gives a reading of 50 cm of mercury. Find the rate of
      flow of oil of Sp.Gr. 0.9 when the coefficient of discharge of the orifice meter is
      0.64.

3. a. List various methods of density measurement and explain any two in detail.   10
   b. Explain Coriolis Mass Flow Meter in detail.   10

4. a. A simple U tube manometer containing mercury is connected to a pipe in which a   10
      fluid of Sp. Gr. 0.8 and having vacuum pressure is flowing. The other end of the
      manometer is open to atmosphere. Find the vacuum pressure in pipe, if the
      difference of mercury level in the two limbs is 40 cm and the height of fluid in the
      left from the centre of pipe is 15 cm below.
   b. Explain construction and working of Electromagnetic Flow Meter. State the   10
      advantages and disadvantages.

5. a. Explain Variable Area type flowmeter.   10
   b. Derive the expression for Gauge Factor in strain gauge.   10

6.   Write short notes on   20
  a. Comparison of orifice plate and venturi meter.
  b. Hot Wire Anemometer.
  c. Conductivity Measurement.

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