(03 Hours)   **(80 Marks)**

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

1.   Answer the following-
   a)   Explain capillary tube viscometer.   05
   b)   What is vena contracta? State and explain types of fluid flow.   05
   c)   State and explain the principle of piezoelectric transducer for pressure   05
       measurement.
   d)   Explain solid flow meter.   05

2. a)   Draw and explain pressure measurement using Bourdon tube and   10
       LVDT.
   b)   State and derive Bernoulli's equation.   10

3. a)   Explain the temperature compensation scheme for strain gauge and   10
       state applications of strain gauge.
   b)   An orifice meter with orifice diameter 15 cm is inserted in a pipe of 30   10
       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.

4. a)   Draw and explain PH set up along with different PH electrodes.   10
   b)   Explain the calibration procedure of pressure gauges using dead weight   10
       tester.

5. a)   Draw neat sketch of pirani gauge and explain the same with   10
       applications.
   b)   What is dynamometer? Explain in details working of absorption type   10
       dynamometer.

6.   Write short note on-   20
   a)   Equation for gauge factor in strain gauge.
   b)   Any one method for torque measurement.
   c)   Characteristics of head type flow meters.
   d)   Force balance type pressure measurement.