Q.P. Code : 551505

(3 Hours) [Total Marks : 80]

N.B. : (1) Question No.1 is compulsory.
(2) **Answer** any **three** from the remaining **five** questions.
(3) Assumptions made should be **clearly** stated.
(4) **Figures** to the right indicate the marks.

1. **Attempt any four :-** 20
   1. Define properties of fluids with their units.
   2. Explain "Vena Contracta" with pressure diagram.
   3. Explain and derive "Hydrostatic Law".
   4. What is ORP ? Why it is required to measure ?
   5. Classify different types of density measurement methods.

2. a) Explain Calibration procedure with neat diagram using Dead Weight Tester. 10
   b) Explain Coriolis Mass Flow Meter in detail. 10

3. a) Explain "Variable Area" type flow meter. 10
   b) A strain gauge is bounded to a beam 0.1 m long & has a cross sectional area 10
      $4cm^2$. Young's modulus for steel is 207GN/m. The strain gauge has an
      unstrained resistance of 240Ω and G.F. of 2.2. When a load is applied, the
      resistance of gauges changes by 0.013Ω. Calculate the change in length of
      the steel beam and an amount of force applied to the beam.

4. a) Compare Orifice & Venturi meter. 10
   b) Explain in details with diagrams types of Venturi meter and Orifice plates. 10

5. a) Explain working of "Mcleod Gauge". 10
   b) Explain pH measurement scheme using suitable diagram. Also give the details 10
      about electrodes.

6. Write short notes on **(Any two)** :- 20
   1. Dynamometer
   2. Electromagnetic Flow meter
   3. Solid flow meter