Q.P. Code :24970

[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 What is ORP? Explain set up used for ORP measurement.

b Explain different types of strain gauges.

c Explain any one method for force measurement.

d What is Vena contracta? State and explain types of fluid flow.

2 a A strain gauge bonded to a steel beam 0.1 m long and has a crossectional area 4 cm^2.Young's modulus for steel is 207 GN/m^2.The strain gauge has an unstrained resistance of 240Ω and gauge factor 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. **10**

b Explain with diagram working of Pirani Gauge. **10**

3 a Explain in details suitable instrument used for calibration of pressure gauges. **10**

b Draw and explain PH set up along with its different electrodes. **10**

4 a Draw and explain pressure measurement scheme using LVDT. **10**

b State and derive Bernoullis equation **10**

5 a Classify flow measurement techniques .Explain the construction and working of mass flow meter. **10**

b A simple U tube manometer containing mercury is connected to a pipe in which a fluid specific gravity 0.8 and having vacuum pressure is flowing. The other end of manometeris 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 center of pipe is 15 cm below. **10**

6 a Compare orifice and venturi meter. **10**

b What are the different methods of Viscosity measurement? Explain any one of them. **10**

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