B.E. Mechanical Engineering (Part Time) - Third Year - Second Semester, 2018

Subject: Experimental Method in Fluid Dynamics

Time : Three hours **Full Marks: 100**

Answer any four [4]

1. With two suitable examples explain the basic functional elements of measurement system. [25]

2. What is the difference between modified input and interfering input. Explain with examples. Also explain two suitable methods of correcting the spurious inputs of a measurement system with examples. [5+5+15]

3. (a) What do you mean by static calibration? Write down the steps of the same.
   (b) What do you mean by accuracy and precision of a measurement system?
   (c) What is the basic difference between analogue and digital modes of operation?
   (d) Why pitot tubes are made L-shaped? Explain. [7+5+5+8]

4. (a) Consider an experiment for measuring Resistance, R, given by
$I=V^2/R$
Where the voltage V is measured 10 times to get the measurements in volts as 10.1, 10.2, 9.9, 10.1, 10.0, 10.1, 9.8, 9.9, 10.5 and 10.0.
The current I is measured 8 times in ampere as 2.1, 2.2, 2.0, 1.9, 2.0, 2.0, 2.1 and 2.0.
Find out the uncertainty in measurement of R.
   (b) What do you mean by scale readability? [20+5]

5. Write short notes on the followings: [5 x 5]
(a) Null and deflection methods
(b) Hysteresis and dead space
(c) Threshold and Resolution
(d) Static sensitivity and Linearity
(e) Active and Passive Transducers