

Mechanical Measurement & Metrology
(ME-307, Dec. 2005)

Time: 3 Hours

Max. Marks: 60

Note: Question No. 1 is compulsory. Attempt any four questions from section B and two questions from section C.

Section-A

1. (a) Explain accuracy, repeatability, resolution sensitivity and threshold sensitivity?
(b) Explain electromagnetic principle.
(c) Explain ballast circuit.
(d) What do you understand by three elements Rosette gauges?
(e) Describe ANSI symbols and composition of Iron constantan and Chromel Constantan.
(f) Explain primary, secondary and working standard.
(g) Explain bonded and unbonded strain gauges.
(h) What is the principle of variable inductance transducers?
(i) What does transducer capability signifies?
(j) What is the significance of reference junction compensation?

Section-B

2. A simply supported beam carries a concentrated load P at its centre. The maximum values of deflection x corresponding to different values of P are:
 $P = 100, 120, 140, 160, 180, 200$
 $X = 0.45, 0.55, 0.60, 0.60, 0.80, 0.85$
Using method of least squares, plot a linear relationship between P and X .
3. Differentiate mechanical and optical comparators.
4. Explain construction and working of Dead weight pressure & ure gauge tester.
5. Explain Resistance and voltage characteristics of Thermistor.
6. Describe photoemission, photovoltaic and photo conductive cells.

Section-C

7. Explain sources of errors in a measuring system.
8. Explain the Dynamics response of the instrument for which the differential equation of motion is of first order.
9. Explain along with constructional, details measurement of temperature with resistance thermometer.