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SF-8193

B. E. II (Sem. IV) Examination

May / June – 2011

Mechanical Measurement & Metrology

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 2 (Sem. 4)**

Name of the Subject :

☛ **Mechanical Measurement & Metrology**

☛ Subject Code No. : **8 1 9 3** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Attempt all questions.
(3) Make suitable assumptions wherever necessary.
(4) Figure to the right indicate full marks.

1 (a) Differentiate : **12**
(i) Hysteresis and Repeatability
(ii) Active and Passive Transducer
(iii) Threshold and Resolution
(iv) Accuracy and Precision

(b) A wheastone's bridge requires a change of 7W in the unknown arm of the bridge to produce a change in deflection of 3 mm of galvanometer. Determine the sensitivity. Also determine in the deflection factor. **2**

(c) Define - Peltier effect. **2**

(d) State advantage of Thermocouple. **2**

(e) Define - "Zero drift, Span drift and Zonal drift". **2**

2 (a) Explain - Dynamic Characteristics of Measurement System. **15**

(b) Classify Measuring Instruments.

OR

2 (a) Short note - Laws of Thermoelectric Circuits. **15**

(b) Define Torque. Explain - "Electric Torque Measurement."

3 (a) Explain Hydraulic Load Cell. **15**

(b) Explain with neat sketch - Bimetallic expansion thermometer.

OR

3 (a) Write construction and working of Differential Manometer with neat sketch. **15**

(b) Explain selection criteria of Transducer.

4 (a) Attempt following questions. **15**

(i) Sketch and interpret the meaning of various interference fringe patterns observe using Optical Flat.

(ii) Explain various methods of measuring surface finish.

(iii) Short note on Angle Dekor.

OR

4 (a) Attempt following questions : **15**

(i) Sketch and explain the working principle of Johnson's Micrometer.

(ii) What are standards of measurements ? Explain classification of various standards.

(iii) Explain alignment tests for Milling Machine.

5 (a) Attempt all questions. **20**

(i) What is selection and care of instrument ? Explain.

(ii) Explain Vernier Height Gauge with neat sketch.

(iii) Explain working principle of Sine Bars with neat sketch.

(iv) Explain various methods of measuring surface finish.

6 (a) Explain following terms : **10**

(i) ISO System

(ii) Accuracy

(iii) Lay

(iv) Least count

(v) Methodology.

(b) Explain Alignment tests for Drilling Machine. **5**

OR

6 (a) Explain following terms : **10**

(i) British standard

(ii) Waviness width

(iii) Contact error

(iv) Flaws

(v) 'Precision'.

(b) Explain Depth Gauge micrometer with neat sketch. **5**