Printed Pages : 3

EME403

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 140404

Roll No. | | | | | | | | | | |

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

MEASUREMENT AND METROLOGY

Time : **2** Hours] [Total Marks : **50**

Note: Attempt all the questions. Assume missing data suitably.

Attempt any two of the following questions : **6×2=12**

1 (a) Define sensor -transducer. Discuss briefly different types of mechanical sensor-transducer with neat sketch.

(b) Classify measurement methods. Discuss Primary, Secondary and Tertiary methods of measurement with suitable examples.

(c) Write short notes on-

(i) XY plotter

(ii) CRO

(iii) Range and span

(iv) Accuracy and precision.

Attempt any two of the following questions : **7×2=14**

2 (a) Explain the working principle of stroboscope.

&

Explain the principle of thermo couple. Also explain their calibration method.

(b) With neat sketch explain the construction and working of bourdon tube pressure gauge.

&

Discuss different types of load cells.

(c) Describe strain gauge. What are Rosette gauges, explain with advantages, limitations and application?

&

Write working of vibrometer.

Attempt any two of the following questions : **6×2=12**

3 (a) A hole and mating shaft are to have a nominal assembly size of 50 mm. The assembly is to have a maximum clearance of 0.15 mm. and a minimum clearance of 0.05 mm. The hole tolerance is 1.5 times the shaft tolerance. Determine the limits for both hole and shaft. By using

i. Hole Basis system

ii. Shaft Basis system.

(b) Describe with sketch the construction and working of a micrometer. Explain how least count is found and reading is taken. What is zero error?

(c) Explain why special attention should be given to GO gauges compared to NOT GO gauges during the design of gauges.

Attempt any two of the following questions : **6×2=12**

4 (a) Explain the terms "Primary texture" and "Secondary texture". Also explain principle of Auto-Collimator.

(b) Sketch two wire methods for measuring effective diameter of screw thread. Also give its limitation. Also define Flatness and describe a method to find out the flatness of a surface plate.

(c) Write the principle of interferometers and also describe working of Tomlinson surface tester for surface measurement.