USN ☐☐☐☐☐☐☐☐☐☐   **10ME32B/10AU32B**

Third Semester B.E. Degree Examination, June/July 2015
Mechanical Measurements and Metrology

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Define the term metrology. List and explain the objectives of metrology.   **(10 Marks)**
   b. Explain with neat sketch : i) Imperial standard yard   ii) International prototype meter.
                 (10 Marks)

2 a. Determine the tolerances on the hole and the shaft for a precision running bit designated by
     $50H_7G_6$. Given :   **(12 Marks)**
     i)   50mm lies between 30-50mm   ii) $i(microns) = 0.45(D)^{1/3} + 0.001D$
     iii) Fundamental deviation for 'g' shaft $= -2.5D^{0.34}$ iv) $IT_7 = 16i$ v) $IT_6 = 10i$.
   b. Explain with neat sketches hole basis system and shaft basis system.   **(08 Marks)**

3 a. Explain with a neat sketch the working of sigma comparator.   **(10 Marks)**
   b. Explain with a neat sketch the construction and working of a LVDT.   **(10 Marks)**

4 a. Explain with a neat sketch, Autocollimator.   **(10 Marks)**
   b. What are the various characteristics that you would measure in a screw thread? Explain 3
     wire method of measuring effective diameter of screw thread.   **(10 Marks)**

PART – B

5 a. With a block diagram, explain generalized measuring system with examples.   **(10 Marks)**
   b. Define the following terms : i) Calibration   ii) Sensitivity   iii) Hysterisis
     iv) Repeatability   v) Accuracy.   **(10 Marks)**

6 a. With a neat sketch, explain the working principle of a CRO.   **(10 Marks)**
   b. With a neat sketch, explain X – Y plotter and list the advantages.   **(10 Marks)**

7 a. With a neat sketch, explain 'Hydraulic Dynomometer'.   **(10 Marks)**
   b. With a neat sketch McLeod gauge.   **(10 Marks)**

8 a. What is a Thermocouple? State the laws of Thermocouple.   **(08 Marks)**
   b. Sketch and explain the working principle of optical pyrometer.   **(12 Marks)**

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