CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐   18ME36B/18MEB306

Third Semester B.E. Degree Examination, Jan./Feb. 2021
Mechanical Measurements and Metrology

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What are the objectives of metrology? **(05 Marks)**
   b. With a neat sketch explain the Imperial standard yard. **(10 Marks)**
   c. A Calibrated metre and bar has an actual length of 1000.0006mm. It is to be used in the calibrate of two bars A and B each having a length of 500mm.
   When compare with metre bar $L_A + L_B$ was found to be shortened by 0.0003 mm. In compare A with B, it was found that A was 0.0005 mm longer than B. Find the actual length of A and B. **(05 Marks)**

OR

2 a. Explain the wringing phenomena of the slip gauges. **(05 Marks)**
   b. Build the dimension 83.3435mm from M87set. **(05 Marks)**
   c. With a sketch explain the Autocollimator and how do you measure the straightness with this? **(10 Marks)**

Module-2

3 a. With a general sketch explain the limits, tolerance Fits, Allowances and Deviations. **(10 Marks)**
   b. Explain the Hole basis and shaft basis systems for a fits. **(10 Marks)**

OR

4 a. List the functional requirements of a comparator. **(05 Marks)**
   b. With a neat sketch explain the electrical comparator. **(10 Marks)**
   c. With a sketch label the parts of Zeiss Ultra optimeter. **(05 Marks)**

Module-3

5 a. With a sketch, show the terminology of screw threads. **(05 Marks)**
   b. How do you measure the major and minor diameter of an internal threads? **(10 Marks)**
   c. Write a note on tool markers microscope. **(05 Marks)**

OR

6 a. Explain the Gear Tooth Thickness measurement using constant chord method. **(10 Marks)**
   b. With a neat sketch explain the Gear Roll tester for composite error. **(10 Marks)**

Module-4

7 a. What are the significance of the measurement? **(05 Marks)**
   b. Explain the stages in Generalized measurement system. **(10 Marks)**
   c. List and brief the classification of errors. **(05 Marks)**

OR

8 a. Explain the primary and secondary transducers. **(05 Marks)**
   b. What are the inherent problems of mechanical intermittent elements? **(05 Marks)**
   c. With a neat sketch explain the working of Cathode Ray Oscilloscope. **(10 Marks)**

Module-5

9 a. With a sketch explain the Prony Brake dynamometer. **(10 Marks)**
   b. Explain the working of a McLeod gauge with a neat sketch. **(10 Marks)**

OR

10 a. Explain the mounting of strain gauges. **(05 Marks)**
   b. Explain the methods of strain measurements. **(10 Marks)**
   c. What are the Laws of Thermocouple? **(05 Marks)**

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