CBCS SCHEME

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17AU35

Third Semester B.E. Degree Examination, July/August 2022
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. Define metrology and discuss the objectives of metrology. **(10 Marks)**

b. Explain the characteristics of Line Standards and End standards. **(10 Marks)**

OR

2 a. Four length bars A, B, C and D each having a basic length 125mm are to be calibrated using a calibrated length bar of 500 mm basic length. The 500mm bar has an actual length of 499.9991 mm. Also it was found that

$L_B = L_A + 0.0001$ mm $L_C = L_A + 0.0005$ mm $L_D = L_A - 0.0002$ mm

$L_A + L_B + L_C + L_D = L + 0.0003$ mm

Determine L_A, L_B, L_C and L_D. **(10 Marks)**

b. Explain with neat sketch transfer from line standard and end standard. **(10 Marks)**

Module-2

3 a. Describe the working of sigma comparator with relevant sketch. **(10 Marks)**

b. With a neat sketch explain the principle of Linear Variable Differential Transformer (LVDT). **(10 Marks)**

OR

4 a. Explain the principle of Mechanical – Optical Comparator with relevant figure. **(10 Marks)**

b. Explain the working of Solex Pneumatic Gauge with suitable figure. **(10 Marks)**

Module-3

5 a. Explain the principle of microoptic autocollimator with suitable figure. **(10 Marks)**

b. Explain the types of mechanical transducers with suitable figure. **(10 Marks)**

OR

6 a. With a neat sketch explain the working of clinometers. **(10 Marks)**

b. Explain briefly principle and working of autocollimator. **(10 Marks)**

Module-4

7 a. Describe the working of Prony brake dynamometer with suitable figure. **(10 Marks)**

b. Explain the construction and working of hydraulic dynamometer with suitable figure. **(10 Marks)**

OR

8 a. Discuss the working of Eddy current dynamometers with suitable figure. **(10 Marks)**

b. Explain the principle of Analytical balance with relevant sketch. **(10 Marks)**

Module-5

9 a. Explain the condition for the success of any system of limits and fits. Also explain the concept of limits of size and tolerance. **(10 Marks)**

b. Explain the types of fits and their designation with suitable figure. **(10 Marks)**

OR

10 a. Explain the working of optical pyrometers with suitable figure. **(10 Marks)**

b. Describe the working of mechanical strain gauge with suitable figure. Also discuss the advantages and limitations of mechanical strain gauge. **(10 Marks)**

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