CBCS SCHEME

15AU35

Third Semester B.E. Degree Examination, June/July 2019
Mechanical Measurements and Metrology

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1 a. Explain the concept of a General Measurement system with a block diagram. **(08 Marks)**
   b. Explain with sketches the following i) Sensitivity ii) Hysteresis. **(08 Marks)**

OR

2 a. Explain with sketch Imperial Yard standard. **(08 Marks)**
   b. Four length bars A, B, C, D each having a basic length 125mm are to be calibrated using a calibrated length bar of 500mm basic length. The 500mm bar has an actual length of 499.9991mm. Also it was found that
   $L_B = L_A + 0.0001mm$
   $L_C = L_A + 0.0005mm$
   $L_D = L_A - 0.0002mm$
   and $L_A + L_B + L_C + L_D = L + 0.0003mm$
   Determine L_A, L_B, L_C and L_D. **(08 Marks)**

Module-2

3 a. Explain with sketch Ziess ultra optical comparator. **(08 Marks)**
   b. Explain the sine principle. How sine bar is used for measuring angle. **(08 Marks)**

OR

4 a. Explain with sketch Solex comparator. **(10 Marks)**
   b. What is Angle Gauge? State the uses and applications of Angle Gauges. **(06 Marks)**

Module-3

5 a. Explain the inherent problems of mechanical IM devices. **(04 Marks)**
   b. Explain advantages of electrical IM devices. **(04 Marks)**
   c. Explain with sketch the principle of inter-ferometery. **(08 Marks)**

OR

6 a. Explain with neat sketch any one type of electrical transducer. **(08 Marks)**
   b. Write note on 'Clinometer' (show sketch). **(08 Marks)**

Module-4

7 a. Define 'Proving Ring'. Explain with sketch the principle of working of a proving ring in force measurement. **(08 Marks)**
   b. Explain with sketch Analytical balance. **(08 Marks)**

OR

8 a. Explain with sketch the Cathode Ray oscilloscope.   (10 Marks)
   b. Explain with sketch X- plotter.   (06 Marks)

Module-5

9 a. Define the terms:
      i)   Tolerance
      ii) Interchangability.   (04 Marks)
   b. Explain with sketches type of fits.   (12 Marks)

OR

10 a. Explain the procedure of mounting of strain gauges.   (04 Marks)
   b. Explain with sketches the two laws of thermo-couple.   (08 Marks)
   c. What is pyrometer? Explain briefly types of pyrometers.   (04 Marks)

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