CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

18ME46B/18MEB406

Fourth Semester B.E. Degree Examination, Feb./Mar. 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. Enumerate any seven objectives of metrology. **(08 Marks)**
   b. With a neat sketch, explain the imperial standard yard. **(06 Marks)**
   c. A calibrated meter end bar has an actual length of 1000.0003 mm which is used to calibrate two bars A and B having basic length of 500 mm. When compared with the standard meter bar it was found to be shorter by 0.0002 mm. comparing the two bars, Bar A is found to be 0.0004 mm longer than Bar B. Find the actual lengths of bar A and B (upto 5 decimal place). **(06 Marks)**

OR

2 a. With neat sketch, explain how sine bar is used to check the unknown angles of small components. **(07 Marks)**
   b. Build the slip gauge for the following dimensions using M112 slip gauge set :
      (i) 47.3165   (ii) 73.892 **(05 Marks)**
   c. With neat sketch, explain the wringing phenomena of slip gauges. **(08 Marks)**

Module-2

3 a. Define Fit. Explain the three types of fits with neat sketches. **(10 Marks)**
   b. Explain Interchangeability and selective assembly. **(06 Marks)**
   c. Enumerate the classification of plain gauges. **(04 Marks)**

OR

4 a. Explain Solex pneumatic gauge with a neat sketch. **(10 Marks)**
   b. Explain with a neat sketch, Zeiss ultra optimeter. Enumerate its advantages. **(10 Marks)**

Module-3

5 a. Derive an expression for the effective diameter of screw thread using two wire method. **(10 Marks)**
   b. With a neat sketch, explain the following gear tooth terminology:
      (i)   Pitch circle diameter
      (ii) Tooth thickness
      (iii) Circular pitch
      (iv) Working depth
      (v)   Module **(10 Marks)**

OR

6 a. With a schematic diagram, explain CMM. **(10 Marks)**
   b. Explain the Chordal thickness method using gear tooth verneir. **(10 Marks)**

Module-4

7 a. With block diagram, explain the generalised measuring system. (07 Marks)
   b. Explain the following: (i) Accuracy (ii) Precision (iii) Hystersis (06 Marks)
   c. Define error. Explain the classification of error, briefly. (07 Marks)

OR

8 a. Explain the piezo electric transducer with neat sketch. (10 Marks)
   b. Explain the light beam oscillograph with neat sketch. (10 Marks)

Module-5

9 a. Explain prony brake with schematic diagram. (10 Marks)
   b. With a neat sketch, explain McLeod gauge. (10 Marks)

OR

10 a. With a basic circuit, explain thermocouple. Explain the two laws of thermocouple. (10 Marks)
    b. With a neat sketch, explain optical pyrometer. (10 Marks)

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