

CBCS SCHEME

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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 vernier. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. With block diagram, explain the generalised measuring system. (07 Marks)
b. Explain the following: (i) Accuracy (ii) Precision (iii) Hysteresis (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)
