



CBCS SCHEME

18ME46B/18MEB406

Fourth Semester B.E. Degree Examination, June/July 2023 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. State the objectives of Metrology. (05 Marks)
- b. Discuss with a neat sketch of International proto type meter. (08 Marks)
- c. Define Standard in Measurement. How are the standards classified? Explain with example. (07 Marks)

OR

- 2 a. Identify different parts of sine center and explain how taper angles are measured. (08 Marks)
- b. Describe the steps in wringing of slip gauges. (04 Marks)
- c. Build the following dimensions using M – 87 set :
i) 49.3825mm ii) 87.3215mm. (08 Marks)

Module-2

- 3 a. Distinguish between Interchangeability and Selective assembly. (06 Marks)
- b. Discuss 'Hole based' and 'Shaft based' system of fits with sketches. (08 Marks)
- c. State and explain Taylor's principle of gauge design. (06 Marks)

OR

- 4 a. Mention important functional requirements of a comparators. (05 Marks)
- b. With a neat sketch, explain the construction and working of Johanson's Mikrokator. (07 Marks)
- c. What is LVDT? With a diagram, explain the Operating principle / working and applications of LVDT. (08 Marks)

Module-3

- 5 a. Explain Terminology of screw thread. (04 Marks)
- b. How do you find effective diameter of a screw thread using Two – Wire method? (08 Marks)
- c. Explain Tool Maker's Microscope with a neat sketch. Give its applications. (08 Marks)

OR

- 6 a. Illustrate the construction and working of co-ordinate measuring machine. (10 Marks)
- b. Explain Constant Chord Method of Tooth thickness measurement of gear. (10 Marks)

Module-4

- 7 a. With the aid of a block diagram, explain the three stages of a generalized measurement system. (10 Marks)
- b. Discuss the terms with relevant sketches :
i) Accuracy ii) Precision
iii) Linearity iv) Calibration v) Threshold. (10 Marks)

OR

- 8 a. Mention any five Mechanical and five Electrical transducers. (05 Marks)
- b. Describe in detail a ballast circuit. (07 Marks)
- c. What are X – Y plotters? With block diagram, explain working of X – Y plotters. (08 Marks)

Module-5

- 9 a. Discuss the working of McLeod gauge. (10 Marks)
- b. Explain the working of Prony brake dynamometer. (10 Marks)

OR

- 10 a. Summarize the laws of Thermocouple and Resistance Thermo meter with sketch. (10 Marks)
- b. Define Gauge factor of a strain gauge and explain with a neat sketch, measurement of strain using wheat stone bridge circuit. (10 Marks)
