# CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

**15MEB406/15ME46B**

## Fourth Semester B.E. Degree Examination, July/August 2022

## 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 role of standards of measurements in modern industry. **(04 Marks)**

b. Discuss the characteristics of line and end standards, describe procedure to transfer line standard to end standard. **(12 Marks)**

**OR**

2 a. Briefly explain the process of wringing of slip gauges. **(04 Marks)**

b. With a neat diagram discuss the working principle, construction of an autocollimator and state its applications. **(12 Marks)**

### Module-2

3 a. Define the following terms:
(i) Tolerance (ii) Allowance (iii) Deviation (iv) Limits (v) Fits **(06 Marks)**

b. State and explain Taylor's principle of gauge design and sketch any two snap gauges and explain. **(10 Marks)**

**OR**

4 a. What is a comparator? List different functional requirements of a comparator. **(06 Marks)**

b. Explain in detail the principle and characteristics of LVDT with a neat sketch and highlight its advantages. **(10 Marks)**

### Module-3

5 a. How do you measure effective diameter of a screw thread using 2-wire method? Explain. **(08 Marks)**

b. Explain in detail constant chord method to measure gear tooth thickness. **(08 Marks)**

**OR**

6 a. Enlist advantages of laser interferometers. **(04 Marks)**

b. List and sketch different types of CMM's. What are the advantages and applications of these CMM's? **(12 Marks)**

### Module-4

7 a. Define the terms:
(i) Accuracy and precision (ii) Calibration (iii) System response and Delay. **(06 Marks)**

b. Distinguish between
(i) Primary and Secondary transducers
(ii) Active and Passive transducers
(iii) Analog and Digital Transducers. **(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.

OR

8 a. What do you understand by intermediate modifying devices? How are electrical devices advantageous over mechanical devices? (08 Marks)

b. With a neat sketch explain the working of a light beam oscillograph. (08 Marks)

## Module-5

9 a. How do you determine force using load cell? Explain with a neat sketch. (08 Marks)

b. Write a note on Dynamometers. (08 Marks)

OR

10 a. Explain Banded and Unbanded strain gauges. (04 Marks)

b. What is a thermocouple? Explain the laws of thermocouple in detail. Also list few thermocouple materials with their advantages. (12 Marks)

* * * * *