CBCS SCHEME

USN | | | | | | | | | | |

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)**

* * * * *