CBCS SCHEME

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18ME46B/MEB406

Fourth Semester B.E. Degree Examination, July/August 2021
Mechanical Measurements and Metrology

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions.***

1 a. Define Metrology. State the objectives of Metrology. **(05 Marks)**
b. Explain Line and End standards. **(05 Marks)**
c. Explain with a neat sketch, a material standard of length. **(10 Marks)**

2 a. Explain briefly wringing phenomenon in slip gauges. **(05 Marks)**
b. How do you specify sine bars? State the limitations of sine bar. **(05 Marks)**
c. Explain an Auto collimator with a neat sketch. Also write its applications. **(10 Marks)**

3 a. Briefly explain Hole basis system and shaft basis system of fit. **(05 Marks)**
b. State the Taylor's principle of gauge design. **(05 Marks)**
c. Explain the different types of fit, with neat sketches. **(10 Marks)**

4 a. State the functional requirements of a Comparator. **(05 Marks)**
b. Classify comparators, giving examples in each category. **(05 Marks)**
c. With a neat sketch, explain a Pneumatic comparator. **(10 Marks)**

5 a. Define any five Screw thread parameters, with a neat sketch. **(05 Marks)**
b. Derive an expression for "Best size" wire in screw thread measurements. **(05 Marks)**
c. Explain with a neat sketch, measurement of effective diameter of screw thread by 3 – wire method. **(10 Marks)**

6 a. Define any five Gear tooth terminology, with a neat sketch. **(05 Marks)**
b. State the application of Tool maker's microscope. **(05 Marks)**
c. Explain the Constant Chord method of measurement of Gear tooth thickness. **(10 Marks)**

7 a. Define i) Error ii) Readability iii) Sensitivity iv) Resolution v) Threshold. **(05 Marks)**
b. Comment on the statement given below An Instrument is :
i) Accurate but not precise ii) Precise but not accurate iii) Accurate and precise. **(05 Marks)**
c. Explain Generalized measurement system, with a block diagram. **(10 Marks)**

8 a. State the inherent problem in Mechanical Intermediate Modifying Systems. **(05 Marks)**
b. Explain any one type of Capacitive transducer, with a neat sketch. **(05 Marks)**
c. Explain an Oscillograph of stylus type, with a neat sketch. **(10 Marks)**

9 a. Briefly explain an Unequal arm balance. **(05 Marks)**
b. What are Dynamometer? Classify dynamometer. **(05 Marks)**
c. Explain a Hydraulic dynamometer, with a neat sketch. **(10 Marks)**

10 a. State the Laws of Thermocouple. **(05 Marks)**
b. Write a note on Gauge factor, with respect to strain gauges. **(05 Marks)**
c. With a neat sketch, explain the principle and working of Pirani gauge. **(10 Marks)**

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