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17ME36B

**Third Semester B.E. Degree Examination, Dec.2019/Jan.2020**  
**Mechanical Measurements and Metrology**

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Write legibly and draw neat diagrams.*

**Module-1**

- 1 a. Define Metrology. State the objectives of Metrology. (04 Marks)  
b. Explain with a neat sketch Imperial yard material standard. (10 Marks)  
c. State the principle and the procedure of measuring angle using sine bar. (06 Marks)

**OR**

- 2 a. Explain with sketches the 'Wringing Phenomenon' of slip Gauges. (10 Marks)  
b. What are Standards? Name and explain the various sub-divisions of Standards. (10 Marks)

**Module-2**

- 3 a. Explain the principle of interchangeability and selective assembly. (10 Marks)  
b. Name the two system of fits. Explain the hole-basis type of system with neat sketch. (10 Marks)

**OR**

- 4 a. Explain with neat sketch, the principle and working of a Solex Pressure Gauge. (10 Marks)  
b. State and explain with sketches the Taylor's principle of design of gauges. (10 Marks)

**Module-3**

- 5 a. How will you measure the effective diameter of screw threads using 2-wire method? (10 Marks)  
b. Explain the constructional features and applications of co-ordinate measuring machines. (10 Marks)

**OR**

- 6 a. Explain any one method of gear tooth thickness measurement with sketch. (10 Marks)  
b. What is a Laser? Explain any one type of Laser interferometer with sketch. (10 Marks)

**Module-4**

- 7 a. Explain with sketch the general concept of a measuring system. (10 Marks)  
b. State the internet problems in mechanical transducers. (04 Marks)  
c. Explain with sketch 'Threshold and Hysteresis' with respect to a measurement system. (06 Marks)

**OR**

- 8 a. Explain with sketch the simple current sensitive circuit of a intermediate modifying (10 Marks)  
b. Explain the construction of an oscillograph. State its advantages. (10 Marks)

**Module\_5**

- 9 a. Explain with sketch the construction and working of Prony brake dynamometer. (10 Marks)  
b. Explain with sketch the Bridgeman type of pressure gauge. (10 Marks)

**OR**

- 10 a. Explain the terms: i) Poisson's Ratio ii) Gauge factor. (02 Marks)  
b. State the procedure of mounting of strain gauges. (08 Marks)  
c. State and explain the two laws of thermocouple with sketches. (10 Marks)



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