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10MT51

Fifth Semester B.E. Degree Examination, June/July 2019
Metrology and Mechanical Measurements

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Sketch and explain the following:
   (i) Imperial standard yard.
   (ii) International prototype. **(10 Marks)**

b. Discuss the following standards of measurements with their characteristics:
   (i) Line standard
   (ii) End standard. **(10 Marks)**

2 a. Explain the following showing the designation of each:
   (i) Clearance fit
   (ii) Interference fit.
   (iii) Transition fit. **(12 Marks)**

b. Explain with neat sketches hole basis system and shaft basis system. **(08 Marks)**

3 a. Explain with a neat sketch the working of sigma comparator. **(10 Marks)**

b. With the help of a neat sketch, explain the construction and working of LVDT. **(10 Marks)**

4 a. Derive an expression for chordal thickness and chordal addendum of a gear tooth in terms of module and number of teeth of the gear. **(10 Marks)**

b. Explain autocollimator with a neat sketch. **(10 Marks)**

PART – B

5 a. Define the following terms:
   (i) Calibration
   (ii) Sensitivity
   (iii) Hysterisis.
   (iv) Repeatability
   (v) Accuracy. **(10 Marks)**

b. With a suitable example, explain the stages of generalized measurement system. **(10 Marks)**

6 a. With a schematic diagram, explain Ballast circuit. **(08 Marks)**

b. With a neat sketch, explain X-Y plotter. **(08 Marks)**

c. Write a note on Telemetry. **(04 Marks)**

7 a. Describe with a neat sketch the working and applications of a proving ring. **(06 Marks)**

b. With a neat sketch, explain Hydraulic dynamometer. **(07 Marks)**

c. Explain measurement of vaccum pressure using thermal conductivity gauge. **(07 Marks)**

8 a. Explain the laws of thermocouples and write the classification of thermocouple materials. **(10 Marks)**

b. Sketch and explain the working principle of optical pyrometer. **(10 Marks)**

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