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Question Paper Code : 90367

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Fifth Semester
Mechanical Engineering
ME 8501 – METROLOGY AND MEASUREMENTS
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is sensitivity ?
2. What is systematic error ?
3. Why are sine bars not used for measuring large angles ?
4. Name any four instruments used for measuring internal diameters of components.
5. Why is laser preferred in engineering metrology ?
6. Name the different stages involved in the machine vision based measurement.
7. Name any four elements of gear which are checked for accuracy.
8. What is 'lead' in screw thread measurement ?
9. Mention few methods of torque measurement.
10. State the principle of hot wire anemometer.

PART – B

(5×13=65 Marks)

11. a) Discuss metrological characteristics of Measuring Instruments. (13)
- (OR)
- b) i) What are random errors ? Discuss their characteristics.
- ii) Compare line and end standards. (6+7)

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12. a) Discuss the construction, working principle, advantages and limitations of mechanical and pneumatic comparators. (13)
(OR)
b) i) Discuss the purpose of limit gauges and list the factors that must be considered in designing limit gauges.
ii) What are adjustable snap gauges and how it differs from snap gauges? (8+5)
13. a) Explain the operation of AC Interferometer with the aid of block diagram and also mention its advantages. (13)
(OR)
b) Sketch and describe the various types of Co-ordinate Measuring Machines. (13)
14. a) Illustrate and explain an accurate method of measuring effective diameter of screw threads. (13)
(OR)
b) Explain the various methods by which roundness is measured. (13)
15. a) i) Illustrate the working principle for Eddy current dynamometer with neat sketch.
ii) Explain pitot tube and state its advantages and limitations. (7+6)
(OR)
b) Describe the working of thermistor with aid of circuit diagram. (13)
- PART – C (1×15=15 Marks)
16. a) Develop a machine vision system for part sorting and bin picking operations and draw the block diagram of machine vision system. (15)
(OR)
b) Select a suitable measurement system for detecting changes in dimensions when components are moving and exhibit its working with schematic diagram. (15)