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Question Paper Code : 80664

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Mechanical Engineering

ME 6504 — METROLOGY AND MEASUREMENTS

(Common to Fourth Semester Mechatronics Engineering and Materials Science and Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Brief on sensitivity in measurement.
2. Differentiate between accuracy and precision.
3. Write short notes on Bevel Protractor.
4. Write short notes on interchangeability.
5. Why laser is used as light source in interferometers?
6. Name the different stages involved in the machine vision based measurement.
7. Define drunken thread.
8. What are the various factors affecting surface roughness of a machined component?
9. Give the principle of hot wire anemometer.
10. Name the materials used for thermocouples.

PART B — (5 × 16 = 80 marks)

11. (a) With a suitable example explain the various elements of generalised measurement system. (16)

Or

- (b) Describe the different types of errors and its causes. (16)

12. (a) Discuss in detail about the various types of limit gauges with neat diagram. (16)

Or

- (b) (i) Explain the working principle of angle dekker with a neat sketch. (10)

- (ii) Write its advantages. (6)

13. (a) (i) With a neat diagram explain the working of AC laser interferometer. (10)

- (ii) List the advantages of AC laser interferometer. (6)

Or

- (b) (i) With neat sketch briefly explain the different types of CMM based on its construction. (8)

- (ii) List out the advantages of CMM. (8)

14. (a) Describe the construction of gear tooth verniercaliper. Explain how it can be used for measuring the tooth thickness. (16)

Or

- (b) Enlist and explain the different methods used for measuring the roundness. (16)

15. (a) (i) Explain the working of rotameter in flow measurement. (8)

- (ii) Discuss the working principle of bourdan tube pressure gauge. (8)

Or

- (b) (i) Draw the construction of electrical resistance thermometer. Explain how it can be used for temperature measurement. (8)

- (ii) With a neat diagram, discuss the working of liquid in glass thermometer. (8)