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Question Paper Code : 21570

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fifth Semester

Mechanical Engineering

ME 2304 / ME 54 / ME 1304 / 10122 ME 505 / 080120044 — ENGINEERING METROLOGY AND MEASUREMENTS

(Common to Production Engineering)

(Common to PTME 2304 – Engineering Metrology and Measurements for B.E. (Part-Time) Fourth Semester – Mechanical Engineering – Regulation 2009)

(Regulation 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Differentiate between dimensional and form tolerances.

2. Define interchangeability.

3. Narrate the need for comparators.

4. Differentiate between sine bar and sine center.

5. What is floating carriage micrometer?

6. Differentiate between straightness and flatness.

7. Give the advantages of coordinate measuring machines.

8. List the equipments needed for computer aided inspection.

9. Define the principles of electrical resistance thermistor.

10. Name the instrument used for low pressure measurements.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the need of standards of measurements in the modem industrial system and describe the term traceability in connection with standards.

Or

(b) Explain the sources of errors in precision measurement with suitable illustrations.

12. (a) Explain the working principles of Tool Makers Microscope with neat sketch. Also list out its applications.

Or

(b) What is a comparator? Discuss the different types of comparators and its applications.

13. (a) Explain how gear tooth thickness and base tangent length is measured using vernier gear tooth caliper and flange micrometer.

Or

(b) Explain the working principles of Gleason gear testing machine with neat sketch. Also list out its applications.

14. (a) Explain how to use laser interferometer to predict machine tool accuracies.

Or

(b) Discuss the need, types and constructional features of Coordinate measuring Machine.

15. (a) Explain the different types of torque measurement techniques with example.

Or

(b) Describe the following temperature measuring instruments

(i) Thermocouple

(ii) Pyrometer.