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Question Paper Code : 10923

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

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. Differentiate between sensitivity and range with suitable example.
2. Define hysteresis.
3. List any four angular measuring instruments.
4. State the principle of interferometry.
5. Why is laser preferred in engineering metrology?
6. Define straightness of axes.
7. Mention the purpose of goniometric heads in tool makers microscope.
8. Define roundness and name the four measurements of roundness.
9. State the need of calibration in measuring instruments.
10. Define the principles of thermocouple.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss in detail about the different types of standards and its usage quoting suitable examples.

Or

- (b) Explain the importance of precision and accuracy in a measuring instrument.

12. (a) Explain the construction and working of Sigma mechanical comparator with neat sketch.

Or

- (b) Explain the construction and working of an autocollimator with neat sketch. Also, write the limitations of Auto collimator.

13. (a) Explain the construction and working of a laser telemetric system with neat sketch.

Or

- (b) Explain the construction and working of a Michelson Interferometer system with a neat sketch.

14. (a) Explain in detail about the various methods used to measure the pitch of a spur gear.

Or

- (b) Explain the different direct methods of surface finish measurement with diagrams wherever necessary.

15. (a) With a neat diagram explain the working of bimetallic strip.

Or

- (b) Explain the working of orificemeter with neat sketch.

PART C — (1 × 15 = 15 marks)

16. (a) Give a brief note on slip gauges and explain various precautionary measures to be followed at various stages of its usage.

Or

- (b) Describe in detail about how to measure the following terminologies in a screw thread.

- (i) major diameter, (5)
- (ii) minor diameter and (5)
- (iii) effective diameter of a screw thread. (5)