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Question Paper Code : 40831

B.E./B.Tech DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

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. How does 'person' as a factor influence the results of a measurement?
2. Discuss the basis of selecting a standard for a particular type of measurement?
3. Write short notes on 'Ring gauges'.
4. What is selective assembly?
5. What is the advantage of using polarized beam splitter over ordinary glass based beam splitter?
6. Mention about the uses of various types of probes used in CMMs.
7. List out the difficulties witnessed in the measurement of flatness of a surface.
8. Brief on the effect of stylus and skid in measurement of surface roughness.
9. What are the uses of a force transducer?
10. Define 'Reliability'.

PART B — (5 × 13 = 65 marks)

11. (a) Briefly explain the elements of a measurement system. (13)
- Or
- (b) Explain various types of errors that occur in engineering measurements. (13)

12. (a) Explain the concept of interchangeability applied to industries. (13)

Or

- (b) Explain various cases of application of sine bars with neat diagrams. (13)

13. (a) Explain with case studies the use of laser interferometers for linear and angular measurements. (13)

Or

- (b) Describe various Industrial applications of CMMs with sketches wherever needed. (13)

14. (a) Explain the procedure for finding the chordal thickness of a gear using a gear tooth vernier caliper. (13)

Or

- (b) Describe various comparison methods of surface assessment. (13)

15. (a) Explain any two types of flow meters with neat diagrams stating their advantages and disadvantages. (13)

Or

- (b) With a neat sketch explain the working of electrical resistance thermometer. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Elaborate on the importance of roughness and waviness in context to various engineering applications. (15)

Or

- (b) Explain the scope of machine vision in a blotting plant with suitable sketches. (15)
