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**G 1429**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Fifth Semester

Mechanical Engineering

MF 331 — ENGINEERING METROLOGY

(Common to Mechatronics Engineering)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the general components of measurement?
2. Define reliability.
3. What are the advantages of mechanical comparator?
4. State Taylor's principle of gauge design.
5. Mention the importance of surface roughness in engineering components.
6. Write a short note on roundness errors.
7. List any four uses of laser.
8. What are the conditions necessary for light interference?
9. Give the complete classification of CMMs based on its type.
10. What is machine vision?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Distinguish between precision and accuracy. (8)  
(ii) Explain various configurations of reliability system with suitable examples. (8)

Or

- (b) Explain various types of measurement errors in detail. (16)
12. (a) (i) Describe with a neat sketch the working and construction of Solex pneumatic comparator. (12)  
(ii) Mention the precautions to be taken while using the slip gauges. (4)

Or

- (b) Describe with a neat sketch the construction and working principle of a microptic autocollimator. (16)
13. (a) Describe the chordal thickness method of measuring the gear tooth thickness using gear tooth vernier caliper. (16)

Or

- (b) (i) Describe with a neat sketch the construction and working of Tomlinson surface meter. (12)  
(ii) What are the disadvantages of stylus and skid type roughness measuring instruments? (4)
14. (a) Explain with a neat diagram the Hetrodyne laser interferometer. (16)

Or

- (b) Explain the application of laser interferometry in linear and angular measurements. (16)
15. (a) Explain with a suitable sketches various types of bridge type CMMs mentioning their advantages. (16)

Or

- (b) Describe the four phases of machine vision system. (16)