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**B.E. (Full Time) End Semester DEGREE EXAMINATION, APRIL / MAY 2011**

Third Semester

Materials Science and Engineering

6

**ME 375 – ENGINEERING METROLOGY AND MEASUREMENTS**

(Regulation 2004)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. State any four important needs for measurement.
2. What is meant by repeatability?
3. What are the limitations of the use of sine bar?
4. What precautions should be taken while using slip gauges?
5. Why LASER is used in metrology?
6. List any four practical applications of machine vision system.
7. List the methods of straightness measurement.
8. What are the precautions to be taken while measuring roundness of surfaces?
9. Justify that flow measurement is essential in many industries.
10. List any four limitations of thermo couple in temperature measurement.

**Part - B ( 5 x 16 = 80 marks)**

11. a) i) Describe and sketch the principle of working of an autocollimator and state its applications. (12)  
ii) What is meant by interchange ability and selective assembly? (4)
  12. a) i) Distinguish between precision and accuracy. (6)  
ii) Discuss the factors affecting the accuracy of the measuring system. (10)
- OR**
- b) i) What is meant by dynamic error and systematic error? (8)  
ii) Distinguish between line standards and end standards. (8)
13. a) How the LASER interferometer used for straightness measurement. (16)  
Explain with suitable example.

**OR**

- b) i) Explain the construction and working of machine vision system? (10)  
ii) List the common types of probes used in CMM. (4)

14. a) i) With the aid of simple sketch, explain the working principle of stylus probe surface measuring system. (12)  
ii) How the surface texture related to tolerances on the surface dimensions? (4)

**OR**

- b) i) Explain the two-wire and three wire methods for measuring effective diameter. (8)  
ii) Explain the construction and working of gear rolling tester. (8)
15. a) i) Explain the construction and working of bimetallic strip thermometer. (12)  
ii) Discuss the common thermocouple specification. (4)

**OR**

- b) Write a short notes on : (16)  
i) Rotameter                      ii) Pitot tube.