Register Number……

**B.E., DEGREE EXAMINATIONS: NOV/DEC 2012**

Fifth Semester

**MECHANICAL ENGINEERING**

MEC115: Engineering Metrology and Instrumentation

**Time: Three Hours** **Maximum Marks: 100**

**Answer All Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Closeness to the true value

   a) Uncertainty b) accuracy c) Measurement d) corrosion

2. The least count of a metric vernier caliper having 25 divisions on vernier scale matching with 24 division of main scale (1 main scale division=0.5 mm) is

   a) 0.005 mm b) 0.01 mm c) 0.02 mm d) 0.001 mm

3. Orientation tolerance refers to

   a) Straightness b) circularity c) Cylindricity d) perpendicularity

4. The thread micro meter measure

   a) pitch diameter b) major angle c) minor diameter d) Angle

5. Millimeter scale of a micrometer is marked on

   a) barrel b) thimble c) spindle d) anvil

6. A sin bar is specified by

   a) Its total length b) centre distance between two rollers

   c) The size of roller d) housing

7. Optical flats are made up of

   a) quartz b)glass c) water d) steel

8. Orientation tolerance refers to

   a) Straightness b) circularity c) cylindricity d) perpendicularity

9. Which of the following is not accurate?

   a) Vernier caliper b) screw gauge c) Optical projector d) slip gauge

10. The basic unit used in angular measurement

    a) Left angle b) angle c) right angle c) 360 degree

**PART B (10x2=20 Marks)**

11. Differentiate between sensitivity and range.

12. Define: Measurand

13. Define least count
14. What are the advantages of pneumatic comparator?
15. Name the devices used for measurement of roundness.
16. Name the various types of pitch errors found in screw?
17. What is CMM?
18. What is interferometer?
19. Give the principle of hot wire anemometer.
20. What are load cells?

**PART C (5x14=70 Marks)**

21. a) Explain the factors affecting the accuracy of the measuring system:

**(OR)**

b) Describe the types of errors in detail.

22. a) Explain with the help of a neat sketch the principle and working of electrical comparator. Also state the advantages

**(OR)**

b) What are the parts of a vertical vernier height gauge. Explain the working with neat sketch.

23. a) Explain the working of a tool makers microscope with neat sketch.

**(OR)**

b) With neat sketch explain the working principle of Parkinson's gear testing machine.

24. a) Explain any two types of CMM with neat sketch.

**(OR)**

b) With neat sketch explain the working of a laser interferometer.

25. a) Explain the working of a LVDT and rotometer with neat sketch.

**(OR)**

b) Explain the construction and working of a bimetallic strip.

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