

**FACULTY OF ENGINEERING**

**B.E. 4/4 (M/P/AE) I – Semester (New) (Main) Examination, November 2013**

**Subject : Metrology and Instrumentation**

**Time : 3 hours**

**Max. Marks : 75**

**Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.**

**PART – A (10 x 2.5 = 25 Marks)**

1. Distinguish between line and end standards.
2. Sketch and explain the principle of dial indicator.
3. Explain the use of sine bar for measurements of angle.
4. Discuss about chart gauges.
5. Differentiate between tolerance and allowance.
6. State the Taylor's principles used in design GO gauges.
7. What is load cell and how it works?
8. List various devices for measuring displacements.
9. Sketch the seismic instruments and indicate the elements in it.
10. Explain principle of bulk modulus gauge.

**PART – B (5 x 10 = 50 Marks)**

11. a) Explain the Taylor's theory of gauging.  
b) List different types of micrometer and explain any two.
12. a) Explain the roundness evaluation procedure with bench centres.  
b) Explain the usage of sine bar with neat sketch.
13. a) Explain Parkinson gear tester with neat sketch.  
b) Distinguish between hole basis and shaft basis.
14. a) Describe the working principle of Piezo electric load cell.  
b) Describe the working of Torsion gauge.
15. a) How do you measure pressure using pirani gauge.  
b) State and explain the laws of thermo electricity.
16. a) What is system response? Explain various system response.  
b) Describe the principle for the measurement of torque with strain gauge Torsion meter.
17. Write short notes on :
  - a) Talysurf
  - b) Precision polygon
  - c) Piezo electric force transducer

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