

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : 91656**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014

Fifth Semester

Mechanical Engineering

ME 2304/ME 54/ME 1304/080120044/10122 ME 505 – ENGINEERING  
METROLOGY AND MEASUREMENTS

(Common to Production Engineering)

(Regulation 2008/2010)

(Common to PTME 2304/10122 ME 505 – Engineering Metrology and  
Measurements For B.E.(Part-Time) Fourth Semester – Mechanical Engineering –  
Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the difference between accuracy and precision.
2. What is meant by calibration?
3. Write the constructional requirements of the sine bar for accurate measurement.
4. Write the difference between comparator and measuring instrument.
5. Derive the expression for 'Best size of wire' in screw thread measurement.
6. Brief any two reference circle used in the measurement of roundness.
7. What are the advantages of Laser in interferometry?
8. Write the features of CMM.
9. Write the principle of temperature measurement using thermocouple.
10. What are the physical characteristics of temperature measuring sensor?

PART B — (5 × 16 = 80 marks)

11. (a) Enumerate various types of errors in measurement with examples . (16)

Or

- (b) Explain the following :
- (i) Interchangeability (6)
  - (ii) Sensitivity and readability (5)
  - (iii) Repeatability and reproducibility (5)

12. (a) (i) Describe with sketch the working principle of Toolmaker's microscope. (10)
- (ii) Discuss the operation of a Pneumatic comparator. (6)

Or

- (b) (i) Explain angle dekkor with neat sketch. (10)
- (ii) Explain how the measurements are made with optical bevel protractor. (6)

13. (a) (i) Explain constant chord method for tooth thickness measurement. (8)
- (ii) Describe any one method of roundness measurement. (8)

Or

- (b) (i) Explain Tomlinson Surface meter with neat sketch. (10)
- (ii) What is meant by flatness and explain any one method to measure the flatness. (6)

14. (a) With a neat sketch explain the working of AC Laser interferometer. (16)

Or

- (b) Explain the construction and measuring principle of CMM. (16)

15. (a) (i) With a neat sketch explain Proving ring for force measurement. (6)
- (ii) Explain the working principle of Hydraulic dynamometer to measure the shaft power. (10)

Or

- (b) (i) Explain the rotameter with neat sketch. (6)
- (ii) Explain any one type of pyrometer for measuring temperature. (10)