

Question Paper Code: P 1419

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Fifth Semester (Regulation 2004)

Mechanical Engineering

ME 1304- ENGINEERING METROLOGY AND MEASUREMENTS

(Common to Automobile Engineering)

(Common to B.E (Part-Time) Fourth Semester Mechanical Engineering-Regulation 2005)

Time: Three hours

Maximum : 100 marks

Answer ALL questions PART

A- (10 x 2 = 20 marks)

1. Distinguish between repeatability and reproducibility.
2. Define interchangeability.
3. Mention any four precautions to be taken while using slip gauges.
4. What are the chances of errors in using sine bars?
5. What is progressive error in screw threads?
6. Define straightness.
7. Why is monochromatic light used in interferometry instead of white light?
8. What are the advantages of computer aided inspection?
9. List the instruments used for measuring temperature.
10. Distinguish between force and torque.

PART B- (5 x 16 = 80marks)

11. (a) (i) Explain the need for measurement. (8)
 (ii) Differentiate between precision and accuracy with suitable examples. (8)

Or

- (b) Explain in detail various types of errors that may arise in engineering measurements. (16)

12. (a) Explain with a neat sketch the construction and of working Sigma comparators. (16)

Or

- (b) (i) Explain with a neat sketch how a Vernier caliper is used for linear measurements. (10)
 (ii) Why is sine bar not suitable for measuring angles above 45°? (6)

13. (a) (i) Describe with a neat sketch the measurement of pitch of internal and external screw threads using a pitch measuring machine. (10)
 (ii) Explain the constant cord method of measuring the tooth thickness in gears. (6)

Or

- (b) Explain with suitable sketches the measurement of straightness using autocollimator. (16)

14. (a) Explain with a neat diagram the construction and working principle of heterodyne laser interferometer. (16)

Or

- (b) Explain the construction and working of various bridge type coordinate measuring machines. (16)

15. (a) Describe the following in connection with pressure measurement :
 (i) Piezo-electric Pressure transducer (8)
 (ii) Variable capacitance transducer. (8)

Or

- (b) Describe with neat sketches:
 (i) Thermocouples. (8)
 (ii) Strain gauge torque meter. (8)