



B.E/B.Tech (Full-Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011
MECHANICAL ENGINEERING BRANCH
FIFTH SEMSTER-REGULATION 2008

ME 9311 – METROLOGY & MEASUREMENTS

Time: 3Hr

Max.Mark:100

Answer ALL Questions

Part –A (10x2=20 Marks)

1. Distinguish between the terms Accuracy and Precision.
2. Why random error is difficult to control?
3. State the advantages of interchangeable system of manufacture.
4. Why sine bar is not used for measuring angles greater than 45 degrees.
5. Why ordinary white light is not used for interferometric work?
6. Mention some of the applications of Machine vision system.
7. Define: Straightness.
8. What do you mean by composite error in a gear?
9. Write short notes on Proving ring.
10. Define the term Reliability.

Part – B (5x16 = 80 Marks)

- 11 Determine the "GO" and "NO GO" gauges for the following fit $30 H_7 f_8$ fit .Being given with usual dimensions. 16
 $i=0.45X (D)^{1/3} + 0.001D$ microns (D in mm)
Fundamental deviation of 'f' shaft = $- 5.5 D^{0.41}$ microns
30 mm falls in the diametric step of 18 and 30 mm
 $IT_7 = 16 i$
 $IT_8 = 25 i$
- 12a Describe the following types of errors and state how they can be taken care of 16
(i) Environmental error (4 marks) (ii) Parallax error (4 marks)
(iii) Error due to vibrations (4 marks) (iv) Error due to poor alignment.(4 marks)
- (OR)
- 12b Describe the construction and working principle of any one Mechanical-Optical 16
comparator.State its advantages.
- 13a With the help of a neat diagram explain the working principle of Bridge type of 16
CMM .State their advantages over other type of CMM's.
- (OR)
- 13b With the help of a neat diagram explain the working principle of A.C. laser 16
interferometer. State its advantages over D.C. laser interferometer.

- 14a Describe the principle and operation of 16
(i) Taylor-Hobson Talysurf (8 Marks)
(ii) Tracer type profilogram. (8 Marks)

(OR)

- 14b Define out of roundness. Explain in detail how Polar graph method can be used to measure the out of roundness of engineering components. 16

- 15a Describe the following in connection with flow measurement 16
(i) veturimeter (8 marks)
(ii) (ii) Rotometer (8 marks)

(OR)

- 15b Describe with neat sketch 16
(i) Thermocouple (8 marks)
(ii) Resistance thermometer (8 marks)