[Total No. of Questions - 8] [Total No. of Printed Pages - 2]
(2125)

15402

M. Tech 3rd Semester Examination

Metrology and Industrial Inspection

PEE-E21

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions out of eight questions. Each question carries equal marks.

1. (a) Differentiate between line and end standards. Explain giving examples. How can end standards be derived from line standards?

   (b) What is Interchangeability? Discuss its significance

   (c) Discuss the entire procedure for the measurement of angle on a component using a sine bar. What are the main advantages, disadvantages and applications? (8+6+6=20)

2. (a) State the possible causes of each of the various types of irregularities found in surface texture. Show how surfaces having the same numerical assessment may have different properties and textures.

   (b) Explain the working of Taylor-Hobson Talysurf machine. (12+8=20)

3. (a) Explain how pneumatic comparators work and briefly enumerate the advantages of differential pneumatic comparators.

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   (b) Define Interferometery. Explain in detail, the principle and working of LASER Interferometer. (10+10=20)

4. (a) What are the main dimensions of v-form screw threads? Discuss the working of Wickman type screw thread gauge.

   (b) Describe the use of gear tooth vernier caliper in measuring major elements of gears.

   (c) Explain the principle of magnification, sensitivity and response with respect to comparators (8+6+6=20)

5. (a) Discuss the applications and procedure of three wire method with neat sketch.

   (b) What are Moire Fringes and how can these be utilized for accurate length measurement?

   (c) Discuss various elements of spur gear and explain constant chord method. (6+6+8=20)

6. (a) Explain the principle and application of optical flats.

   (b) Explain the advantages of using wavelength standards.

   (c) State various sources of errors in manufacturing gears. (6+6+8=20)

7. (a) Explain the procedure for numerical assessment of roundness.

   (b) Explain the purpose of calibration and discuss how calibration of end gauges in sets and standard scales is done. (8+12=20)

8. Write short notes on the following (any two) :

   (a) Selection of gauging equipment.

   (b) Electrical comparators.

   (c) Limits, fits and tolerances. (10+10)