Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

M.Tech. (Mechanical Engineering) (Manufacturing Engineering & Automation) (Sem.–3)

METROLOGY & INDUSTRIAL INSPECTION

Subject Code : MTME-217

M.Code : 92862

Date of Examination : 03-01-23

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

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT question.**
2. **Each question carry TWENTY marks.**

1. a) Explain methods and measuring equipment for testing of Gauges.

   b) What do you understand by error in Measurement? How is it measured?

2. a) How do you measure taper of a ring gauge by precision Ball and Rollers? Explain with detailed diagram.

   b) What do you understand by Optical Dividing Head? Explain with principle and neat diagram.

3. a) Define Pressure measuring instruments. Differentiate between electro-mechanical and Electronic in respect to applications, advantages and limitations of one over another.

   b) How low pressure is Measured? Give detailed presentation of any one low pressure measuring Device.

4. a) Explain principle and working of Parson's Rolling Tester.

   b) Explain basic tangent method for measurement of tooth thickness of a gear.

5. a) Describe waviness, straightness and Roughness. Are these terms inter-related? Give you explanation for and against the interrelation of these terms.

   b) Explain terms Ra, RMS, R_z, CLA values in respect of roughness measurement. Which out of these is best utilised?

6. a) Explain various Contact and Non-contact methods of inspection. What are advantages of one over other? Write applications of each.

   b) What is Comparator? Write the name of different types of Comparators. Describe any one suitable comparator from your answer that can be used for ruling and calibration of standard scales.

7. a) What are the different elements of screw threads required to be inspected and measured? Describe a suitable measuring method for inspecting the screw threads. Give simple sketch of a screw thread showing different elements in support of your answer and describe.

   b) Explain the detail procedure for selection of Gauging Equipment.

8. Write short notes on the following:

   i) Flatness and square-ness testing.

   ii) Pneumatic comparators and calibration.

   iii) Measurement of gears profiles.

   iv) Sine bar and surface plate.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.