

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 4 – EXAMINATION – SUMMER 2026

Subject Code: 3141901

Date: 19/05/2026

Subject Name: Mechanical Measurement and Metrology

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1**
- (a) Define metrology and explain its objectives. **03**
 - (b) Differentiate between hole basis and shaft basis system. **04**
 - (c) Explain the Generalized Measurement System with Required diagrams. **07**
- Q.2**
- (a) Build a stack of slip gauges (M112) to obtain a dimension of 57.63 mm. **03**
 - (b) Write a Full form of LVDT. Describe the working principle of LVDT. **04**
 - (c) Illustrate the method of angle measurement using a sine bar. **07**
- OR**
- Q.2**
- (c) Compare mechanical, electrical, pneumatic, and optical comparators. **07**
- Q.3**
- (a) Define: Pitch, Major Diameter and Minor diameter. **03**
 - (b) How to Calculate Best size of Wire for Screw Thread Measurement. **04**
 - (c) Explain Three Wire method for Screw Thread Measurement. **07**
- OR**
- Q.3**
- (a) State the name of Screw Thread Elements. **03**
 - (b) Differentiate Involute Profiled Teeth and Cycloidal Profiled Teeth in Gear. **04**
 - (c) Differentiate Hole Basis System and Shaft Basis System with respect to Geometric Dimensioning and Tolerances. **07**
- Q.4**
- (a) Define Static Error and Random error. write 4 errors name of static errors and random errors. **03**
 - (b) Differentiate Repeatability and Reproducibility. **04**
 - (c) Define Transducer and Transfer Efficiency. Classify the Transducer in Details. gives examples of each transducer **07**
- OR**
- Q.4**
- (a) Write a Full Form of CMM. State the Application of CMM Machine. **03**
 - (b) Define LASER. State Applications of Laser in Measurement, **04**
 - (c) Write a Working Principle of Prony Brake Dynamometer and State the Application with Advantages and Disadvantages. **07**
- Q.5**
- (a) Classify the Strain Gauge. **03**

- (b) Define Pressure and State the various Pressure measurement Method for different Range of Pressure. **04**
- (c) Write a Short note on Resistance Thermometer. State It's Advantages, Disadvantages and Application. **07**

OR

- Q.5** (a) Define Force, Power and Torque. **03**
- (b) Differentiate Line Standard and End Standard. **04**
- (c) Discuss the Applications of Laser Interferometry in the Space Engineering. **07**
