

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-IV EXAMINATION – WINTER 2025

Subject Code:3141901

Date:13-11-2025

Subject Name:Mechanical Measurement and Metrology

Time:02:30 PM TO 05:00 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.

	MARKS
Q.1 (a) Define metrology and list the objectives of metrology.	03
(b) Briefly explain about wavelength standard.	04
(c) Draw block diagram of a generalized measurement system and explain various elements in detail.	07
Q.2 (a) Define tolerance and write a difference between unilateral and bilateral tolerance.	03
(b) Differentiate between line standards and end standards.	04
(c) Explain construction and working of tool makers microscope with neat sketch. List its application.	07
OR	
(c) Discuss about construction and working of rope brake dynamometer. List its advantages and limitations.	07
Q.3 (a) Briefly explain accuracy and precision with suitable example.	03
(b) Compare hole basis system and shaft basis system.	04
(c) Describe about Auto collimator and list its application.	07
OR	
Q.3 (a) List the applications of comparators.	03
(b) Define fit and explain its types.	04
(c) Explain three wire methods for measuring effective diameter of screw thread with neat sketch.	07
Q.4 (a) How to measure angle of heavy component using sine bar?	03
(b) Briefly explain about plug gauge and ring gauge.	04
(c) List the characteristics of good comparators. Describe about Johnson Mikrokator.	07

OR

- Q.4** (a) Explain about addendum and dedendum of gear. **03**
(b) How to measure temperature using optical pyrometer? **04**
(c) Briefly discuss about wringing and manufacturing process of slip gauges. Also write down uses of slip gauges. **07**

- Q.5** (a) Compare systematic and random errors. **03**
(b) List advantages and application of Coordinate Measuring Machines. **04**
(c) How to measure chordal thickness using gear tooth vernier caliper? Explain in detail. **07**

OR

- Q.5** (a) Wear allowance is provided on the GO gauges only. Justify the statement. **03**
(b) Explain about construction and application bourdon tube pressure gauge. **04**
(c) Explain about construction and working of optical pyrometer. List its applications. **07**
