

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2021****Subject Code:3141901****Date:05/01/2022****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.

	Marks
Q.1 (a) Define the terms: (i) Threshold (ii) Linearity (iii) Sensitivity	03
(b) Differentiate following terms: - 1) Systematic and random errors, 2) Reproducibility and Repeatability	04
(c) What is coordinate measuring machine? Discuss various configuration of CMM.	07
Q.2 (a) Explain the working principle of a laser transducer system.	03
(b) What is the basic difference between sine bars, sine plates, and sine tables?	04
(c) Explain vernier micrometer Screw with neat sketch. How least count of vernier micrometer can be calculated?	07
OR	
(c) Explain with neat sketch how conical work pieces are inspected on a sine centre.	07
Q.3 (a) Give comparison between involute and cycloidal gears.	03
(b) Explain Parkinson gear tester with neat sketch.	04
(c) Derive the depth of gear using constant chord method	07
OR	
Q.3 (a) How is Taylor's principle applicable to thread gauging?	03
(b) Derive the expression for the best-size wire in a two-wire method.	04
(c) Derive the diameter over wire(Maximum) H for thread measurement using three wire method	07
Q.4 (a) Explain the characteristics of good comparator.	03
(b) What are the primary reasons for surface irregularities?	04
(c) Explain with neat sketch construction and working of sigma comparator.	07
OR	
Q.4 (a) Give a detailed classification of fits.	03

- (b) Differentiate between hole basis and shaft basis systems. **04**
- (c) Describe with neat sketch “Linear Variable Differential Transformer”.
Comment on its application. **07**
- Q.5** (a) Explain the principle and types of thermocouple. **03**
- (b) Explain briefly the methods of force measurement. **04**
- (c) Write a short note on rope brake dynamometer, **07**
- OR**
- Q.5** (a) Classification of instruments for pressure measurement. **03**
- (b) What is gauge factor? Explain its importance. **04**
- (c) Sketch and explain McLeod Gauge used for low pressure measurement. **07**
