

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV(NEW) EXAMINATION – WINTER 2022****Subject Code:3141901****Date:13-12-2022****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
<b>Q.1</b> (a) State difference between measuring and gauging.	<b>03</b>
(b) Classify types of fit and explain any one of them with neat sketch.	<b>04</b>
(c) Explain construction and working of Autocollimator.	<b>07</b>
<b>Q.2</b> (a) Define Joe Blocks and state material used for its fabrication & its application.	<b>03</b>
(b) Define Error and Explain systematic error with remedies to avoid it in measurement.	<b>04</b>
(c) Name the various methods used for measurement of tooth thickness and explain any one of them.	<b>07</b>
<b>OR</b>	
(c) Explain with neat sketch the working of any one type of interferometers.	<b>07</b>
<b>Q.3</b> (a) State operating principle of pressure gauge & pressure transducer.	<b>03</b>
(b) Define the following term	<b>04</b>
i) Base Circle ii) Pitch Diameter iii) Module	
iv) Diametral pitch	
(c) Discuss the construction and working of thermocouple with neat sketch.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Describe briefly most commonly used forms of gear tooth.	<b>03</b>
(b) Explain working of optical comparators with neat sketch.	<b>04</b>
(c) Explain with neat sketch construction and working of the Zeiss Ultra optimeter.	<b>07</b>
<b>Q.4</b> (a) State Desirable characteristics of strain gauge.	<b>03</b>
(b) State basic requirements of sine bar to get good accuracy & limitation of it.	<b>04</b>
(c) Draw a block diagram representation of a generalized measurement system. Identify the various elements and point out the functions performed by each element.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) List out desirable features of a comparator.	<b>03</b>
(b) List type of strain gauge and explain working of any one with neat sketch.	<b>04</b>
(c) What is CMM? List types of CMM and explain how the linear distance can be read out with great accuracy using CMM.	<b>07</b>
<b>Q.5</b> (a) Compare primary, secondary, tertiary and working standards.	<b>03</b>
(b) Define transducer. State advantage and disadvantages of electronic transducer.	<b>04</b>

- (c) Compare one wire, two wire and three wire methods of measuring effective diameter. **07**

**OR**

- Q.5** (a) Give comparison of Line standard vs End standards. **03**  
(b) Explain working of eddy current dynamometer with neat sketch, **04**  
(c) Explain working of rope brake dynamometer and justify its advantages over limitation. **07**

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