

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– IV (New) EXAMINATION – WINTER 2019****Subject Code: 2141901****Date: 13/12/2019****Subject Name: Mechanical Measurement & 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.

|  | <b>MARKS</b> |
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| <b>Q.1 (a)</b> State necessity and objectives of metrology.  | <b>03</b>    |
| <b>(b)</b> Differentiate following terms: i) Accuracy and precision<br>ii) Repeatability and Reproducibility     | <b>04</b>    |
| <b>(c)</b> Describe errors and sources of errors.  | <b>07</b>    |
| <b>Q.2 (a)</b> What precaution should be taken while using micrometer.   | <b>03</b>    |
| <b>(b)</b> Write a short note on : Spirit level  | <b>04</b>    |
| <b>(c)</b> Explain the construction and working of a Vernier Caliper.  | <b>07</b>    |
| <b>OR</b>  |              |
| <b>(c)</b> Explain the followings: i) Mechanical strain gauges<br>ii) Gauge factor                               | <b>07</b>    |
| <b>Q.3 (a)</b> Write application and limitation of angle gauges.   | <b>03</b>    |
| <b>(b)</b> Explain Proving ring with sketch.   | <b>04</b>    |
| <b>(c)</b> Describe with sketch the construction and working of a RTD. Give advantages and disadvantages of RTD. | <b>07</b>    |
| <b>OR</b>  |              |
| <b>Q.3 (a)</b> What is a 'Peltier effect' in thermocouple?   | <b>03</b>    |
| <b>(b)</b> Explain hemispherical bore gauge with applications.   | <b>04</b>    |
| <b>(c)</b> What are absorption dynamometers? Explain any one with a neat sketch.                                 | <b>07</b>    |
| <b>Q.4 (a)</b> List out various characteristics of good comparators  | <b>03</b>    |
| <b>(b)</b> Write a short note on seismic accelerometer.  | <b>04</b>    |
| <b>(c)</b> Explain Tool maker's Microscope.  | <b>07</b>    |
| <b>OR</b>  |              |
| <b>Q.4 (a)</b> Write the advantages of Coordinate measuring machines   | <b>03</b>    |
| <b>(b)</b> Explain Liquid in glass Thermometer.  | <b>04</b>    |
| <b>(c)</b> Explain the construction and working of LVDT with its advantage and disadvantages.                    | <b>07</b>    |
| <b>Q.5 (a)</b> Explain surface texture characteristics.  | <b>03</b>    |
| <b>(b)</b> Explain adverse effect of poor surface finish.  | <b>04</b>    |
| <b>(c)</b> Explain Two wire method for measuring effective diameter of thread.                                   | <b>07</b>    |
| <b>OR</b>  |              |
| <b>Q.5 (a)</b> Give comparison between involute and cycloidal gears.   | <b>03</b>    |
| <b>(b)</b> Explain Parkinson gear tester with neat sketch.   | <b>04</b>    |
| <b>(c)</b> Sketch and describe the construction and working of Tomlinson surface roughness tester.               | <b>07</b>    |

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