

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- IV EXAMINATION – SUMMER 2020****Subject Code: 3141901****Date: 26/10/2020****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.

- Q.1** (a) Define terms: (i) Metrology (ii) Accuracy (iii) Precision **03**
 (b) Define the following characteristics of measurement system: **04**
 (i) Dead zone, (ii) Drift, (iii) Calibration, (iv) Hysteresis
 (c) Explain generalized measurement system using suitable example. **07**
- Q.2** (a) What do you understand by systematic errors and random errors? **03**
 (b) Why sine bar is not preferred for angles greater than 45°? Explain. **04**
 (c) Enlist methods of measurements. Explain Slip gauges with wringing process. **07**
- OR**
- (c) Describe with neat sketch the construction and working of a micrometer. **07**
- Q.3** (a) Define following terms related to screw thread measurement: **03**
 (i) Lead, (ii) Pitch, (iii) Crest
 (b) Explain line and end standards with examples. **04**
 (c) Explain three wire method for measuring effective diameter of a thread. **07**
- OR**
- Q.3** (a) Write the advantages of coordinate measuring machines **03**
 (b) Explain Parkinson gear tester with a neat sketch. **04**
 (c) Describe with neat sketch the construction and use of gear tooth vernier caliper. **07**
- Q.4** (a) Define fit and with the help of neat sketches, explain the different types of fits. **03**
 (b) Write short note on proving ring type load cell. **04**
 (c) Describe the working and construction of LVDT with neat sketch. **07**
- OR**
- Q.4** (a) Explain light wave length standard. **03**
 (b) Explain the working principal of pneumatic comparators with neat sketch. **04**
 (c) Explain working of McLeod gauge for pressure measurement. **07**
- Q.5** (a) Define unilateral and bilateral tolerances. Give examples for each. **03**
 (b) Explain the terms interchangeable manufacture and interchangeable assembly. **04**
 (c) Explain optical pyrometer for measurement of temperature. **07**
- OR**
- Q.5** (a) How are temperatures measuring instruments classified? **03**
 (b) Explain in brief the principle of thermocouple stating illustrations. **04**
 (c) Describe the construction and working of resistance temperature detector (RTD) with neat sketch. **07**