

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER- IV • EXAMINATION – SUMMER-2015

Subject Code: 141901**Date:01/06/2015****Subject Name: Mechanical Measurement and Metrology****Time: 10.30am-01.00pm****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) Draw a block diagram of a generalized measurement system (GMS) and explain various elements in detail. **07**
- (b) Define and Explain following terms: **07**
 (i) Accuracy and Precision (ii) Hysteresis (iii) Threshold.
- Q.2** (a) Explain construction and working principle of Vernier caliper with neat sketch. **07**
- (b) Describe with neat sketch construction of sine bar. State working principle and limitations of sine bar for angular measurement. **07**
- OR**
- (b) What are the salient features of a comparator? Explain SIGMA mechanical comparator with neat sketch. **07**
- Q.3** (a) Explain various elements related to screw thread measurement. Explain the difference between two wire and three wire method used for screw thread Measurement. **07**
- (b) State methods of measuring tooth thickness. Explain the construction and working of gear tooth vernier caliper. **07**
- OR**
- Q.3** (a) Explain the construction and working of Telesurf surface roughness measuring instrument with neat sketch. **07**
- (b) Describe with sketch working of McLeod gauge for pressure measurement. **07**
- Q.4** (a) State working principle of thermocouple. Describe construction and working of thermocouple. **07**
- (b) (i) Explain the proving ring in brief. **04**
 (ii) Differentiate between a bellow gauge and a diaphragm gauge. **03**
- OR**
- Q.4** (a) Enlist various alignment tests for lathe machine and explain any three in brief. **07**
- (b) Which are the methods for shaft power measurement? Explain any one in detail. **07**
- Q.5** (a) Compare RTD and THERMISTOR as temperature measuring devices. **07**
- (b) What is calibration? Describe method of calibrating Pressure gauge with dead weight tester and also enlist sources of errors in the method of calibration. **07**
- OR**
- Q.5** (a) Define and explain the following terms: **07**
 (i) Straightness (ii) parallelism (iii) Flatness.
- (b) (i) State the factors affecting surface texture. **03**
 (ii) Distinguish between a line standard and an end standard. **04**
