

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER– IV EXAMINATION – WINTER 2017**

**Subject Code: 141901****Date: 21/11/2017****Subject Name: Mechanical Measurement and Metrology****Time: 02.30PM to 05.00PM****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) Define the following characteristics of measurement system; **07**  
(i) Dead zone, (ii) Linearity, (iii) Sensitivity, (iv) Threshold, (v) Fidelity, (vi) Drift, (vii) Overshoot.
- (b) Classify the instrument for pressure measurement. Explain bourdon tube pressure gauge. **07**
- Q.2** (a) Differentiate the followings; **06**  
(i) Precision and Accuracy, (ii) Line and End Standards , (iii) Instrument and Measurement.
- (b) With neat sketch explain in details about construction and working of bimetallic thermometer. **08**
- OR**
- (b) With neat sketch explain in details about construction and working of optical pyrometer. **08**
- Q.3** (a) State working principle of Vernier Micrometer. With neat sketch explain in details about construction and working of Vernier Micrometer. **07**
- (b) Name the various methods used for measurement of tooth thickness and explain any one of them. **07**
- OR**
- Q.3** (a) Explain three wire method to measure the effective diameter of given screw thread with neat sketch. **07**
- (b) Explain working of McLeod gauge for pressure measurement. **07**
- Q.4** (a) Explain in brief about the followings; **07**  
(i) Stroboscope, (ii) Resonance (vibrating reed) tachometer.
- (b) Explain in brief ,with neat sketch, about the followings; **07**  
(i) Telescopic gauge, (ii) Universal bevel protractor.
- OR**
- Q.4** (a) Describe followings with neat sketch. **07**  
(i) Slip Gauge, (ii) Dial Indicator.
- (b) Explain the importance of alignment tests for machine tools. State various alignment tests for machine tool. Briefly explain any one the alignment test for machine tool. **07**
- Q.5** (a) Classify temperature measuring instruments with temperature range of each category. Compare temperature scales with diagram. **07**
- (b) What are the various possible sources of errors in measurement? Define static error and explain any two static errors with example. **07**
- OR**
- Q.5** (a) What is comparator? Why it required? Give its classification in detail. **07**
- (b) Explain principle of Auto-Collimator. Sketch Auto-Collimator and state its application. **07**

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