Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER • 2014

Subject Code: 141901 Date: 29-12-2014

Subject Name: Mechanical Measurement and Metrology

Time: 02:30 pm - 05:00 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)** Differentiate the followings briefly. **07**

(i) Precision and Accuracy
(ii) Line and End Standards
(iii) Systematic Error and Random Error
(iv) Instrument and Measurement

(b) Explain the following characteristics of measurement system: **07**
(i) Dead zone (ii) Drift (iii) Sensitivity (iv) Threshold (v) Fidelity (vi) Linearity (vii) Overshoot

Q.2 **(a)** Classify measurement methods. Discuss Primary, Secondary and tertiary methods of measurement with suitable examples. **07**

(b) Define detector-transducer. Discuss briefly different types of mechanical detector-transducer with neat sketch. **07**

OR

(b) Define LVDT. Explain its working with neat sketch. Also state its practical application. **07**

Q.3 **(a)** Sketch micrometer. Label all important parts of it. Also explain least count of micrometer with suitable example. **07**

(b) Describe followings with neat sketch. **07**

(i) Slip Gauge (ii) Dial Indicator

OR

Q.3 **(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**

Q.4 **(a)** Sketch two wire methods for measuring effective diameter of screw thread. Also give its limitation. **07**

(b) List out the various elements required to be check during inspection of gear. Describe methods of measurement of any two in detail. **07**

OR

Q.4 **(a)** Describe working and construction of Tomlinson surface tester for surface measurement. **07**

(b) Discuss any three alignment test conducted on radial drilling machine. **07**

Q.5 **(a)** Write short note on Thermister. **07**

(b) Classify force balance pressure gauges. Explain any one in detail. **07**

OR

Q.5 **(a)** Describe construction and working of optical pyrometer. **07**

(b) Explain followings briefly. **07**

(i) Stroboscope (ii) Resonance (vibrating reed) tachometer

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