Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC - SEMESTER–II EXAMINATION – WINTER 2015**

**Subject Code: X21903** **Date:30/12/2015**

**Subject Name: Mechanical Measurement & 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Differentiate between (i) Accuracy and Precision (ii) Line and End standards | **07** |
| | **(b)** | Classify linear measuring instruments. Explain the measurement of outside diameter of cylinder by vernier calliper. | **07** |
| **Q.2** | **(a)** | Why comparator is required? State applications and characteristics of good comparators. | **07** |
| | **(b)** | Explain dial Indicator with neat sketch and state its application. | **07** |
| | | **OR** | |
| | **(b)** | Explain the depth micrometer and its use with neat sketch. | **07** |
| **Q.3** | **(a)** | State working principle of sine bar. Explain use of sine bar for (i) locating any work to given angle (ii) checking or measuring unknown angles. | **07** |
| | **(b)** | Explain working principle, construction of autocollimator with neat sketch. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain the following elements of screw thread with neat sketch. (i) Pitch diameter (ii) Crest (iii) Root (iv) Lead (v) Thread angle (vi) Helix angle (vii) Lead angle | **07** |
| | **(b)** | State various methods for gear tooth thickness measurement. Explain any one in brief. | **07** |
| **Q.4** | **(a)** | State direct instrument measurement methods for surface roughness. Explain any one of them. | **07** |
| | **(b)** | Name various alignment tests to be performed on milling machine. Explain any three in detail. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What are primary, secondary and tertiary measurements? Explain with example. | **07** |
| | **(b)** | Classify methods of temperature measurement. Explain vapour pressure thermometer with neat sketch. | **07** |
| **Q.5** | **(a)** | Explain Optical pyrometer with neat sketch. State its advantages. | **07** |
| | **(b)** | Explain bellow pressure gauge with neat sketch. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Describe principle, construction and working of Mcleod gauge. | **07** |
| | **(b)** | Explain construction and working of following (i) Eddy current dynamometer (ii) centrifugal tachometer | **07** |

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