Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–IV • EXAMINATION – SUMMER 2013**

**Subject Code: 141901** **Date: 12-06-2013**

**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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Draw a block diagram of a generalized measurement system (GMS) and explain the various elements of it in detail. | **07** |
| | **(b)** | Explain the following giving suitable examples:<br>( i) Range and span (ii) Accuracy and precision<br>(iii) Threshold and resolution (iv) Calibration | **07** |
| **Q.2** | **(a)** | List and explain the different terms related to screw Explain the difference between two wire and three wire method used for screw thread measurement. | **07** |
| | **(b)** | Explain the construction and working of gear tooth vernier caliper. How will you measure gear tooth thickness with this instrument? | **07** |
| | | **OR** | |
| | **(b)** | Explain the construction and working of standard gear tester with neat sketch. | **07** |
| **Q.3** | **(a)** | (i) It is not prefer to use sinebar for measuring angle more than $45^0$ .Why?<br>(ii) Explain the different surface roughness evaluation methods. | **07** |
| | **(b)** | Explain the construction and working of vernier height gauge with neat sketch. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain the construction and working of the following with neat sketch :<br>( i ) Telescopic gauge (ii) Universal bevel protractor . | **07** |
| | **(b)** | Explain the construction and working of Telesurf surface roughness measuring instrument with neat sketch.. | **07** |
| **Q.4** | **(a)** | Explain the construction and working of bourdon tube pressure gauge (along with tube materials) with neat sketch. | **07** |
| | **(b)** | (i) Explain the flash light stroboscope.<br>(ii) Explain the diaphragm gauges in brief. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain the construction and working of Mcleod gauge with neat sketch. | **07** |
| | **(b)** | (i) Explain the proving ring in brief.<br>(ii) Explain the difference between a bellow gauge and a diaphragm gauge. | **07** |
| **Q.5** | **(a)** | (i) Explain the bimetallic thermometer in detail. | **07** |
| | **(b)** | (i) Explain the importance of alignment tests for machine tools. Briefly explain the alignment tests for machine tool (any ONE). | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | (i) Write a short note on: International temperature scale (ITS).<br>(ii) Explain flatness measurement in brief. | **04**<br>**03** |
| | **(b)** | (i) Explain the thermoelectric pyrometer in detail. | **07** |

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