

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER 2013****Subject Code: 143402****Date: 23-12-2013****Subject Name: Metrology and Computer Aided Inspection****Time: 02:30 pm to 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) Write the application and different types of Coordinate Measuring Machine. Explain any one CMM measuring principle with neat sketch. **07**
- (b) Define linear measurement. Explain in brief about Vernier caliper with sketch. **07**
- Q.2** (a) Define Error in measurement. Write the types of Error and explain about any two Errors in brief. **07**
- (b) Write the Sine Principle. Explain how to find unknown angle by using the principle with sketch. **07**
- OR**
- (b) Explain how to measure the surface finish by using Tomlinson surface meter? Explain the working principle of it. **07**
- Q.3** (a) Write the different terminology used in surface roughness. Describe any four terminologies. **07**
- (b) What is the role of legal metrology? Why calibration is required for measuring instruments? **07**
- OR**
- Q.3** (a) Write the working principle of Laser Interferometer with neat sketch. Write the uses. **07**
- (b) Write the working principle of Michelson Interferometer with neat sketch. Write the uses. **07**
- Q.4** (a) Write the objectives of Quality Control. Write the factors affecting Quality. **07**
- (b) Draw and explain fishbone chart for action plan to achieve the Quality. **07**
- OR**
- Q.4** (a) Write short notes about Six Sigma. Write the advantages of it. **07**
- (b) Write the objectives of Quality Assurance System. **07**
- Q.5** (a) Explain about Vision system with suitable block diagram. **07**
- (b) What do you understand by scanning Laser gauge? Explain with schematic diagram. **07**
- OR**
- Q.5** (a) Define gray scale analysis. Write the advantages and limitations of computers in Metrology. **07**
- (b) Write the working principle of Machine Vision system with block diagram **07**
