Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER – II • EXAMINATION – SUMMER 2017

Subject Code: 1722804 **Date:15/05/2017**

Subject Name: Metrology and Computer aided Inspection

Time:10:30 A.M. to 01:00 P.M. **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)**	Explain the principle of measurement and process of measurement. Distinguish between Accuracy and Precision.	**07**
	(b)	Explain the term traceability in connection with standards. Distinguish between Primary, Secondary, Tertiary and Working standards of Length.	**07**
Q.2	**(a)**	What is Surface and Form Metrology? Explain the factors affecting surface roughness and give reasons for controlling surface texture.	**07**
	(b)	Explain the methods of evaluation of surface finish. Describe Ten Point Height methods for finding R_z value.	**07**
		OR	
	(b)	Define the terms "Primary Texture" and "Secondary Texture". Explain with neat sketch Profilograph for surface roughness.	**07**
Q.3	**(a)**	Explain the characteristics of a good comparator. Give the list of comparators.	**07**
	(b)	Explain with advantages, disadvantages and neat sketch Zeiss Optotest Comparator.	**07**
		OR	
Q.3	**(a)**	Explain the principle of interference. Elaborate N.P.L flatness interferometer.	**07**
	(b)	Write short note on "LASER Interferometer".	**07**
Q.4	**(a)**	Explain alignment test on machine tools using LASER. Give their necessity.	**07**
	(b)	Explain the roundness and surface roughness using LASER in piping industries.	**07**
		OR	
Q.4	**(a)**	Difference between contact and contactless measurements. Explain the tool wear measurements.	**07**
	(b)	Define sensor. Explain the basic operating principle of sensor with a schematic diagram.	**07**
Q.5	**(a)**	Short note on Laser Scanner and Printer.	**07**
	(b)	State the principle & working of inductive proximity sensors.	**07**
		OR	
Q.5	**(a)**	Describe the classification of microwave sensing technology. Discuss the characteristics of microwave sensors.	**07**
	(b)	Short note on CMM. Explain the calibration process of CMM.	**07**