Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER 2013

Subject Code: 141901 Date: 23-12-2013

Subject Name: Mechanical Measurement and Metrology

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)**	Define Metrology. Explain clearly difference between primary, secondary and working standards.	**07**
	(b)	Define and Explain following terms (i) Sensitivity (ii) Linearity (iii) Hysteresis	**07**
Q.2	**(a)**	Explain with neat sketch Method of measurement of Taper plug using sine bar	**07**
	(b)	Explain working principle of micrometer Draw neat sketch of micrometer and Label each parts of micrometers	**07**
		OR	
	(b)	Explain working principle of Vernier caliper Draw neat sketch and label each part. Find out Least count of Vernier caliper.	**07**
Q.3	**(a)**	Explain with neat sketch measurement of effective diameter screw thread using three wire methods. How best size of wire is selected.	**07**
	(b)	Explain method tooth thickness measurement by Gear tooth Vernier caliper.	**07**
		OR	
Q.3	**(a)**	Explain construction and working of Tomlinson surface roughness tester.	**07**
	(b)	State the various possible errors on the gear. Explain how circular pitch measuring machine measure circular pitch error of Gear	**07**
Q.4	**(a)**	Explain working of dead weight tester .how pressure gauge is calibrated on dead weight tester.	**07**
	(b)	Explain with neat sketch working of optical pyrometer	**07**
		OR	
Q.4	**(a)**	Explain the principle of thermo couple. Also explain their calibration method	**07**
Q.4	**(b)**	Explain working of Mcleod gauge for pressure measurement	**07**
Q.5	**(a)**	Explain the alignment Test on the lathe machine is carried out explain various step in brief.	**07**
	(b)	Explain in brief following (i) Nutating disc flow meter (ii) construction and working of load cell.	**07**
		OR	
Q.5	**(a)**	Explain working principle of Linier variable Differential transformer (LVDT) and advantages disadvantage of LVDT	**07**
	(b)	Explain following method for measurement of straightness (i) The Auto- collimator method (ii) Precision sprit level method	**07**

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