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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (New) • EXAMINATION – WINTER 2016

Subject Code: 2141901 Date: 22/11/2016

Subject Name: Mechanical Measurement & 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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Explain Range and Span.	
	2	State the different use of Telescopic gauge.	
	3	Define Accuracy and precision.	
	4	List out various sources of errors in measurement.	
	5	What is Calibration?	
	6	Define Sensitivity and Hysteresis.	
	7	Give the classifications of Tachometers.	
	8	List Method used for force measurement.	
	9	What is International temperature scale (ITS)?	
	10	Define: (i) Resolution (ii) Threshold.	
	11	How to calculate Least count of micrometer screw with figure.	
	12	Define Errors and give their classification.	
	13	What is Standards of measurements?	
	14	Draw neat sketch of gear tooth terminology.	
Q.2	**(a)**	Explain construction and applications of Micrometer clinometer.	**03**
	(b)	List out various elements to be checked for accuracy of gear and describe any two.	**04**
	(c)	Explain the construction and working of bourdon tube pressure gauge with neat sketch.	**07**
		OR	
	(c)	Explain working of Mcleod gauge for pressure measurement.	**07**
Q.3	**(a)**	Explain the construction of a Vernier Caliper.	**03**
	(b)	Explain Liquid in glass Thermometer.	**04**
	(c)	Explain with the help of neat sketches the principle and construction of an auto-Collimator.	**07**
		OR	
Q.3	**(a)**	Explain Linear variable differential transducers	**03**
	(b)	Explain Working principal of Resistive Potentiometer.	**04**
	(c)	Enlist methods of measurements. Explain Slip gauges with wringing process.	**07**
Q.4	**(a)**	List out various characteristics of good comparators.	**03**
	(b)	Explain the principle of thermo couple. Also explain their calibration Method.	**04**
	(c)	Explain the construction and working of the following with neat sketch. (i) Telescopic gauge (ii) Universal bevel protractor .	**07**
		OR	
Q.4	**(a)**	Explain Tool maker's Microscope.	**03**
	(b)	Write a short note on: Spirit level	**04**

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	(c)	State the various possible errors on the gear. Explain how circular pitch measuring machine measure circular pitch error of Gear	**07**
Q.5	**(a)**	Explain adverse effect of poor surface finish	**03**
	(b)	Explain the working principle of Ionization gauge.	**04**
	(c)	Explain in brief following (i) Nutating disc flow meter (ii) construction and working of load cell.	**07**

OR

Q.5	**(a)**	Explain Light wave length standard	**03**
	(b)	Distinguish between Primary, Secondary, Tertiary and working standards of length.	**04**
	(c)	Explain following method for measurement of straightness (i) The Auto- collimator method (ii) Precision sprit level method	**07**

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