Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2143402 Date:22/11/2016

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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Define: Precision	
	2	Define: Accuracy.	
	3	List out various sources of errors in measurement.	
	4	Explain Indirect Method of measurement.	
	5	Define Least count of an instrument with example.	
	6	State the different use of Telescopic gauge.	
	7	Define: Comparators.	
	8	Define following terms related to screw thread measurement: (i) Lead, (ii) Pitch.	
	9	Define Pitch circle diameter.	
	10	Define terms: (i) Primary texture (ii) Secondary Texture.	
	11	Explain Dead zone and Drift.	
	12	Give the classifications of Tachometers.	
	13	Define: Resolution.	
	14	Explain Range and Span.	
Q.2	**(a)**	State necessity and objectives of metrology.	**03**
	(b)	Explain the following terms used in surface finish with sketch: i. Roughness ii. Waviness iii. Effective profile iv. Centerline of profile	**04**
	(c)	Explain the construction and working of a Vernier Caliper.	**07**
		OR	
	(c)	Give classification of comparators and explain Dial indicator with sketch.	**07**
Q.3	**(a)**	Explain various forms of Gear teeth.	**03**
	(b)	Explain briefly: Telescopic Gauge	**04**
	(c)	Enlist methods of measurements. Explain Slip gauges with wringing process.	**07**
		OR	
Q.3	**(a)**	Draw the vernier bevel protractor construction.	**03**
	(b)	Describe the working of Vernier bevel protractor.	**04**
	(c)	Explain about Height gauge with neat sketch.	**07**
Q.4	**(a)**	Give the detail classification of Tachometer.	**03**
	(b)	Explain the 'Gauge factor'.	**04**
	(c)	What are the applications of vision system in metrology?	**07**
		OR	
Q.4	**(a)**	Explain adverse effect of poor surface finish.	**03**
	(b)	Why sine bar is not preferred for angles greater than 45^0? Explain.	**04**
	(c)	Describe briefly the construction and operation of CMM.	**07**

Q.5	**(a)**	Explain the histogram models.	**03**
	(b)	Describe the different types of errors in measurement.	**04**
	(c)	Discuss about the zero defects in computer integrated quality assurance.	**07**

OR

Q.5	**(a)**	Explain the image models.	**03**
	(b)	Briefly explain POKA-YOKE method with a suitable sketch.	**04**
	(c)	Explain the laser micrometer with a neat sketch.	**07**

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