Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – BRIDGE COURSE – TRIMESTER – I EXAMINATION – OCTOBER 2012

Subject code: 141901 Date: 25-10-2012

Subject Name: Mechanical Measurement and Metrology

Time: 02:30 pm – 05:30 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)**	Classify temperature measuring instruments with temperature range of each category. Compare temperature scales with diagram.	**07**
	(b)	Discuss generalised measuring system and its functional element.	**07**
Q.2	**(a)**	Explain with a neat sketch the constructional features and basic working principle of Mcleod gauge.	**07**
	(b)	Define metrology and explain its necessity and objective. Differentiate precision and accuracy.	**07**
		OR	
	(b)	Name the various alignment tests which are conducted on lathe. Explain any three with diagram.	**07**
Q.3	**(a)**	What is sine bar? Explain with the help of diagram the principle of sine bar.	**04**
	(b)	What precautions should be taken while using micrometer.	**03**
	(c)	Explain the construction and working of a vernier height gauge with the help of a neat sketch.	**07**
		OR	
Q.3	**(a)**	State the advantages and limitations of vernier caliper, vernier height gauge, external micrometer and dial indicator.	**04**
	(b)	What are angle gauges? How are they used?	**03**
	(c)	Discuss methods to measure angle in tapered shafts and holes.	**07**
Q.4	**(a)**	Explain the procedure of measuring 'Major diameter' of a screw thread by using a bench micrometer.	**04**
	(b)	Explain any two methods of measuring flatness.	**03**
	(c)	Draw the neat sketch of a toolmaker's microscope, label it and explain its working.	**07**
		OR	
Q.4	**(a)**	How the measurement of following elements of internal screw threads can be done? Major diameter, Minor diameter, Effective diameter, Pitch and Thread angle	**07**
	(b)	Define straightness. Explain any two methods of measuring straightness.	**04**
	(c)	Explain briefly the types of irregularities of a circular part.	**03**
Q.5	**(a)**	Explain with a neat diagram the method of measuring linear velocity with the use of moving magnet type transducer.	**04**
	(b)	Differentiate between first, second, third and fourth order irregularities.	**03**
	(c)	Explain with neat sketch the construction and working of gear tooth vernier caliper.	**07**
		OR	
Q.5	**(a)**	Explain the working and principle of Talysurf surface roughness tester.	**04**
	(b)	Explain prony brake dynamometer?	**03**
	(c)	Name the instruments which are used for measuring the gear tooth profile. Explain any one of them with neat sketch.	**07**

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