GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2023

Subject Code:3141901   **Date:11-01-2024**

Subject Name: Mechanical Measurement and Metrology

Time: 10:30 AM TO 01:00 PM   **Total Marks:70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define accuracy, repeatability, resolution.	**03**
	(b)	Differentiate line standard and end standard.	**04**
	(c)	List types of errors. Discuss in brief systematic errors.	**07**
Q.2	**(a)**	Write classification of threads.	**03**
	(b)	Explain Dial indicator.	**04**
	(c)	Explain generalized measurement system with example.	**07**
		OR	
	(c)	Explain the use of sine bar with a neat sketch. Mention it's advantages and limitations.	**07**
Q.3	**(a)**	Classify instruments for pressure measurement.	**03**
	(b)	Explain the principle of thermocouple.	**04**
	(c)	Write a short note on rope brake dynamometer,	**07**
		OR	
Q.3	**(a)**	Explain hydraulic load cell.	**03**
	(b)	A platinum resistance thermometer has a resistance of 100 Ω at 25°C. Find it's resistance at 65°C if the temperature co-efficient of platinum is 0.0039 C^{-1}. If the thermometer has a resistance of 150 Ω, calculate the temperature.	**04**
	(c)	Explain McLeod gauge with a diagram.	**07**
Q.4	**(a)**	Explain the need for tolerance.	**03**
	(b)	Explain Parkinson gear tester with neat sketch.	**04**
	(c)	Derive the expression for the best-size wire in a two-wire method.	**07**
		OR	
Q.4	**(a)**	List the primary reasons for surface irregularities.	**03**
	(b)	Derive an expression for gear tooth thickness using chordal thickness method.	**04**
	(c)	Define fit. Describe various types of fits.	**07**
Q.5	**(a)**	Explain optical amplifier.	**03**
	(b)	Describe LVDT.	**04**
	(c)	Discuss various configuration of CMM.	**07**
		OR	
Q.5	**(a)**	Mention any three advantages of electrical intermediate modifying devices.	**03**
	(b)	Explain the principle of electrical Strain gauges.	**04**
	(c)	Explain with neat sketch working of any one interferometer.	**07**

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