U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: III**

Branch: Industrial Engineering and Management **Duration: 3 hrs.**

Course Code: 23IM3PCIME **Max Marks: 100**

Course: Industrial Metrology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		What is International System of Units? Mention the advantages of coherency of this system of units.	*CO1*	*PO1*	**05**
	b)		What are slip gauges? What are their uses?	*CO1*	*PO1*	**05**
	c)		Compare and contrast line standards and end standards.	*CO2*	*PO2*	**10**
			OR			
2	a)		Determine the tolerances on the hole and the shaft for a precision running fit designated by 50 H7g6, given; 50 mm lies between 30-50 mm i (in microns)=$0.45(D)^{1/3}+0.001D$ Fundamental deviation for 'H' hole=0 Fundamental deviation for g shaft =$-2.5D^{0.34}$ IT7=16i and IT6=10i State the actual maximum and minimum sizes of the hole and shaft and maximum and minimum clearances	*CO3*	*PO3*	**12**
	b)		How is a gauge designed using Taylor's principle.	*CO2*	*PO2*	**08**
			UNIT - II			
3	a)		Explain the different types of error that may occur in measurement of screw thread.	*CO1*	*PO1*	**08**
	b)		With a neat diagram, explain the Two-wire method of measuring the effective diameter of a screw thread.	*CO1*	*PO1*	**08**
	c)		How do you measure the taper angle using a sine bar?	*CO1*	*PO1*	**04**
			OR			

	4	a)	With a neat sketch, explain the working principle and benefits of Parkinson's gear tester.	*CO2*	*PO2*	**10**
		b)	How do you measure the pitch using Tool maker's microscope? Explain with a neat diagram.	*CO2*	*PO2*	**10**
			UNIT - III			
	5	a)	What is a comparator? How do you choose a comparator that is good for use?	*CO1*	*PO1*	**08**
		b)	Explain the working of a Sigma comparator with the help of a neat diagram.	*CO3*	*PO3*	**08**
		c)	State the limitations of comparators.	*CO3*	*PO3*	**04**
			OR			
	6	a)	State the factors affecting surface roughness.	*CO1*	*PO1*	**05**
		b)	Why is comparison method of inspection of surfaces preferred for surface finish measurement? List the various comparison methods.	*CO1*	*PO1*	**05**
		c)	How is the surface finish measured using Stylus probe instrument? List the advantages and limitations of this instrument.	*CO1*	*PO1*	**10**
			UNIT - IV			
	7	a)	With suitable illustrations, explain the primary, secondary and tertiary measurements.	*CO1*	*PO1*	**10**
		b)	With a neat block diagram, explain the basic elements of a generalized measurement system.	*CO1*	*PO1*	**10**
			OR			
	8	a)	With a neat sketch, explain the working of optical pyrometer.	*CO1*	*PO1*	**10**
		b)	How do you define the term Error in measurements? Classify and explain the related errors.	*CO1*	*PO1*	**10**
			UNIT - V			
	9	a)	Explain the working principle of 3D scanner and list its applications.	*CO1*	*PO1*	**06**
		b)	What are laser interferometers? Explain their types.	*CO1*	*PO1*	**06**
		c)	What is a Coordinate Measuring Machine (CMM)? Explain any two types of CMM.	*CO1*	*PO1*	**08**
			OR			
	10	a)	When does a "non-contact measurement" become important?	*CO1*	*PO1*	**08**
		b)	What do you understand by nano-metrology? Explain the classifications of nano structures.	*CO1*	*PO1*	**12**

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