U.S.N.										

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

Autonomous Institute Affiliated to VTU

April 2024 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)	Consider the instance of Imperial Standard Yard, Slip Gauges and Monochromatic Light Source. Interpret the following instance to differentiate their characteristics of respective standards.	CO1	PO1	**12**
	b)	Define Standards. Explain briefly International Prototype Meter with neat sketches.	CO1	PO1	**08**
		OR			
2	a)	With the help of schematic representation differentiate between Hole Basis System and Shaft Basis System with their application.	CO1	PO1	**06**
	b)	A hole and shafting system have the dimension $60H_7/m_6$. The standard tolerance is given by $i = 0.45\sqrt[3]{D} + 0.001D\ microns$. Where D = diameter (mm) of geometric mean step of 50 to 80mm. Multipliers **Grade** 6 7 **Multiplier** 10 16 The fundamental deviation for fit 'm' is given by FD = (IT7 – IT6) for the relevant range of diameter. Find: i. The class of fit and state its applications ii. Sketch the fit and show the actual dimensions	CO3	PO3	**10**
	c)	What are the essential considerations in selection of materials for gauges, and what are the common materials used for gauges?	CO1	PO1	**04**
		UNIT - II			

	3	a)	Which type of the wire makes contact at the pitch line of the screw thread? And how do you determine the diameter of that wire	*CO2*	*PO2*	**06**
		b)	As gear tooth profile varies from top to bottom of tooth, which type of method is used to measure the choral thickness and choral depth theoretically? Also mention which instrument will be used to measure Choral thickness and depth of gear tooth. Sketch the instrument.	*CO2*	*PO2*	**10**
		c)	Using a diagram, explain the following terms in relation to screw thread: (i) Pitch (ii) Depth of thread	*CO1*	*PO1*	**04**
			UNIT - III			
	4	a)	What are comparators? What kind of comparator is utilized to transform a linear displacement into an electrical signal that is proportionate? Also cite its benefits.	*CO1* *CO2*	*PO1* *PO2*	**14**
		b)	State the basic difference between comparator and measuring instruments with an application.	*CO1*	*PO1*	**06**
			OR			
	5	a)	The surface finish on the milled surface is limiting between 0.32 – 25 microns with a cut-off length 2.5mm, machining allowance 0.56mm. The direction of lay angular. How will you represent it conventionally?	*CO1*	*PO1*	**06**
		b)	If the surface is too rough, the initial rate of wear is too large which affects the life of the components. How do you measure the surface roughness by the help of carrier modulating principle? Support your answer with a suitable diagram.	*CO1* *CO2*	*PO1* *PO2*	**14**
			UNIT - IV			
	6	a)	Consider any instrument of your choice and explain its generalized measurement system. Support with relevant diagram.	*CO2*	*PO2*	**10**
		b)	What sort of device is appropriate for temperature measurement of furnaces, molten metals, and other overheated materials or liquids has to be monitored? Provide a relevant diagram to support your response.	*CO2*	*PO2*	**10**
			UNIT - V			
	7	a)	Mention and explain the Applications of laser interferometer	*CO1*	*PO1*	**08**
		b)	Explain the principles of CMM with a neat diagram	*CO1*	*PO1*	**06**
		c)	What is 3 D scanning? Describe it applications.	*CO1*	*PO1*	**06**

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