U.S.N.										

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

Autonomous Institute Affiliated to VTU

October 2024 Supplementary 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 Dynamic Metrology? List five benefits of the international system of units	*CO1*	*PO1*	**06**
	b)	With a neat sketch explain the Hole basis and Shaft basis system for any two types of fit.	*CO2*	*PO2*	**06**
	c)	Determine the tolerances on the hole and shaft for a precision running fit designated by25 H8/d9 i) 25 mm lies between 18-30 mm ii) (ii) i (microns)= $0.45D^{1/3}+0.001D$ iii) Fundamental deviation of the H hole=0 (iv) Fundamental deviation for "d" shaft= $-16D^{0.44}$ (v) IT8=25i and (vi) IT9=40i State the actual maximum and minimum sizes of the hole and shaft and maximum and minimum clearances	*CO3*	*PO3*	**08**
		UNIT - II			
2	a)	Explain the various elements of Screw thread with the illustration and which element of screw thread can be determined by two wire and three wire methods? Which method is accurate among two and three wire methods?	*CO4*	*PO3*	**10**
	b)	Illustrate and explain how to inspect the height and angle of the given specimen using sine bar with and without the assistance of mechanical Comparator	*CO3*	*PO3* *PO12*	**10**
		UNIT - III			
3	a)	Explain the characteristics of Linear Variable Differential transformer (LVDT) and with a legible sketch explain the working and construction of LVDT	*CO3*	*PO2*	**10**

		b)	Explain the working and construction of solex pneumatic comparator. List the advantages of solex comparator over any mechanical comparator.	*CO3*	*PO2*	**10**
			OR			
	4	a)	Differentiate between Primary texture and secondary texture of a surface.	*CO1*	*PO1*	**04**
		b)	How is the surface roughness designated in the basic symbol? With the illustration explain the indication of any one surface roughness values in the surface finish symbols	*CO2*	*PO2*	**06**
		c)	Describe the principle and operations of Tomlinson Surface Meter instrument with the help of a diagram.	*CO2*	*PO2*	**10**
			UNIT - IV			
	5	a)	With a neat sketch explain generalized measuring system and with an aid of bourdon tube explain the three stages of measurements	*CO2*	*PO2*	**08**
		b)	Describe any four static and dynamic characteristics of measuring instruments	*CO2*	*PO2*	**08**
		c)	Classify the errors in Measurements	*CO2*	*PO2*	**04**
			OR			
	6	a)	Explain direct and indirect method of measurement of force with examples	*CO2*	*PO2*	**04**
		b)	With the illustration explain Mcleod gauge to measure the force.	*CO3*	*PO3*	**08**
		c)	With a neat diagram explain the construction and working of optical pyrometer	*CO3*	*PO3*	**08**
			UNIT - V			
	7	a)	What are the advantages of 3D scanners in the digital world? Contrast them from traditional "point-by-point" measurement devices.	*CO2*	*PO2*	**06**
		b)	Coordinate measuring machines is a modern inspection tool in Manufacturing, justify the statement.	*CO2*	*PO2*	**06**
		c)	With a neat diagram explain the working of cantilever type of Coordinate measuring machines	*CO2*	*PO2*	**08**

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