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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: 19IM3DCIME **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.

				CO	*PO*	Marks
			UNIT - I			
1	a)	Distinguish between Line Standard and End Standard. Give their examples.		CO1	-	**08**
	b)	What are comparators? Explain Sigma Comparator with a neat diagram. Also mention its important features compared to other mechanical comparators.		CO2	*PO1*	**12**
		OR				
2	a)	Determine the type of fit after describing the fundamental deviations and tolerance in the following. Fit Ø 70 H9 e7 Diameter step (50-80) Fundamental deviation for e shaft = -11 D 0.41 IT7 =16i IT9 =40i $i = 0.45\sqrt[3]{D}+0.001D$		CO3	*PO2*	**07**
	b)	Mention and explain different types of fit with neat schematic representations.		CO1	-	**06**
	c)	Explain the Taylor's principle in the design of GO and NOGO limit gauges and briefly explain the gauge tolerance.		CO2	*PO1*	**07**
		UNIT - II				
3	a)	What kind of precision instrument is used to find the tapered angle of the workpiece? Justify your answer with the diagram of precision instrument.		CO3	*PO2*	**08**
	b)	Explain Parkinson's gear tester with the help of diagram.		CO1	-	**08**

		c)	Define the following w.r.t. external screw thread i) Thread angle ii) Flank iii) Crest iv) Root	CO1	-	**04**
			UNIT - III			
	4	a)	State how surface finish is designated on drawing.	CO1	-	**04**
		b)	Analyze the irregularities given below and categorize on which orders of geometrical irregularities it falls and explain. (i) Due to weight of the material itself (ii) Feed mark of the cutting tool (iii) Chatter marks on the surfaces of the parts.	CO3 CO3	*PO2* *PO3*	**06**
		c)	Mention some of the Inspection by comparison methods. Explain any 2 in detail.	CO2	*PO1*	**10**
			UNIT - IV			
	5	a)	Define the following with respect to measurement system: i. Calibration ii. Accuracy iii. Precision iv. Threshold v. Repeatability	CO1	-	**10**
		b)	By considering bourdon tube as a pressure measuring instrument, explain generalized measurement system. Describe your answer using a block diagram.	CO3	*PO2*	**10**
			OR			
	6	a)	Explain working principle and applications of elastic members.	CO2	*PO1*	**06**
		b)	What is pyrometer? Explain the construction and working principle of optical pyrometer.	CO2	*PO1*	**14**
			UNIT - V			
	7	a)	Explain with a help of neat diagram the 4 main structures of CMM which incorporates the basic concept of three coordinate axes.	CO2	*PO1*	**12**
		b)	What is 3 D scanning? Mention its applications. Give a detailed explanation of any two applications.	CO2	*PO1*	**08**

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