Academic year 2025 – 2026 (ODD Sem)

DEPARTMENT OF INDUSTRIAL ENGINEERING& MANAGEMENT

Date	6th November 2025	Maximum Marks	50
Course Code	IM235AI	Duration	90 Min
Sem	III Semester	CIE – I	

Digital Metrology

Part – A

Sl. No.	Questions	M	BT	CO
1.	Mention two examples each of mechanical and electrical modifying elements.	02	L2	CO1
2.	Differentiate between repeatability and reproducibility.	02	L1	CO1
3.	Differentiate between active and passive transducers.	02	L1	CO2
4.	What are direct comparison and indirect comparison calibration methods.	02	L1	CO1
5.	What is the working principle of a Hall-effect sensor	02	L1	CO2

Part – B

Sl. No.	Questions	M	BT	CO
1.	Describe briefly the three stages of a generalized measurement system with a neat block diagram. Illustrate how the concept of a generalized measurement system is applied in pressure monitoring using a Bourdon-tube-based gauge on an automated production line.	10	L3	CO1
2.	Discuss the static and dynamic characteristics of measuring instruments with the help of simple sketches and response curves. Analyze how maintaining a proper balance between static accuracy and dynamic response leads to improved measurement system performance.	10	L2	CO1
3.	Describe the construction and working principle of a Linear Variable Differential Transformer (LVDT). Explain how the movement of the core within the coils produces an output voltage proportional to displacement, and mention any four practical industrial applications of LVDTs in measurement and control systems.	10	L3	CO2
4.	Illustrate the working principle and applications of Eddy Current Proximity Sensors used in metrology. Evaluate their performance in detecting surface cracks and measuring the thickness of metallic components in industrial systems, and discuss key factors affecting their accuracy and reliability.	10	L3	CO2
5.	Explain the principle, construction, and working of a Tachogenerator used for measuring rotational speed in metrology. Describe how it provides real-time speed feedback in automated manufacturing systems.	10	L3	CO2

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4	L5	L6
	Quiz	Max Marks	06	04	--	--	--	08	02	--	--	--	--
	Test		20	30	--	--	--	--	20	30	--	--	--

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