CBCS SCHEME

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BAU402

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2025
Mechanical Measurements and Metrology

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define accuracy, precision, sensitivity calibration and repeatability. Explain with examples.	10	L1	CO1
	b.	Explain with sketches, the concept of a generalized measurement system.	10	L2	CO1
		OR			
Q.2	a.	Demonstrate how calibration of a pressure gauge is performed and exits significance.	10	L3	CO1
	b.	Compare primary and secondary transducers with examples. Illustrate the function of electrical transducers in a measuring system.	10	L4	CO1
		Module – 2			
Q.3	a.	Define line standard and end standard explain with examples.	10	L1	CO1
	b.	Analyze the differences between hole basis and shaft basis systems. Which system is preferred and why?	10	L4	CO1
		OR			
Q.4	a.	Describe the steps involved in calibrating end bars and explain its relevancy in industry.	10	L2	CO1
	b.	Compare the principle of interchangeability with selective assembly in the context of mass production.	10	L4	CO1
		Module – 3			
Q.5	a.	What is an LVDT? State its construction and working principle.	10	L1	CO2
	b.	Explain the working principle of a sine bar and angle gauge. Derive the formula used for angle building.	10	L2	CO2
		OR			
Q.6	a.	List the different types of comparators and explain the working principle of any one type.	10	L1	CO2
	b.	Compare optical flats and autocollimators with respect to their use in angular measurement and interferometry.	10	L4	CO2
		Module – 4			
Q.7	a.	Define strain and explain the principle of a strain gauge.	10	L1	CO3
	b.	Illustrate with a neat diagram the working of eddy current dynamometer.	10	L3	CO3
		OR			
Q.8	a.	Explain the working principle of a an analytical balance with equations.	10	L2	CO3
	b.	Analyze the electromagnetic and ultrasonic flow meters based on their working principle.	10	L4	CO3
		Module – 5			
Q.9	a.	Explain the laws of thermocouples and how they are applied in temperature measurement.	10	L1	CO4
	b.	Describe the construction and working principle of the McLeod gauge.	10	L2	CO4
		OR			
Q.10	a.	With the help of a schematic diagram, explain the working of a Coordinate Measuring Machine (CMM).	10	L2	CO4
	b.	Elaborate the working principle of an ionization gauge.	10	L1	CO4

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