

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BAU402

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2026

Mechanical Measurement 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.	Illustrate generalized measurement system with a neat sketch.	10	L3	CO1
	b.	Give the classification of errors in detail	5	L2	CO1
	c.	Explain the following : i) Accuracy ii) Precision iii) Repeatability iv) Least count v) Threshold	5	L2	CO1
OR					
Q.2	a.	Differentiate between primary and secondary transducers with examples.	5	L2	CO1
	b.	With neat sketches illustrate the following mechanical transducers. i) Diaphragm ii) Bellows	5	L3	CO1
	c.	Write a short note on piezoelectric transducers.	10	L3	CO1
Module – 2					
Q.3	a.	With a neat sketch explain the features of international prototype meter.	10	L2	CO2
	b.	Four length bars of basic length 100 mm are to be calibrated using a calibrated length bar of 400 mm whose actual length is 399.9992 mm. It was also found that length of B, C, D in comparison to A are +0.0002 mm, +0.0004 mm and -0.0001 mm respectively and the length of all the four bars put together in comparison to the standard bar is + 0.0003 mm longer. Determine the actual dimensions of all four end bars.	10	L4	CO2
OR					
Q.4	a.	Write a short note on Talyor's principle of gauge design.	10	L3	CO3
	b.	Determine the tolerance on the hole and shaft for a precision running fit designated by 50 H ₇ g ₆ . Given : 50 mm lies between 30-50 mm, Fundamental deviation of hole = 0, Fundamental deviation of shaft = -2.5 D ^{0.34} , IT7 = 16i, IT6 = 10i.	10	L5	CO3
Module – 3					
Q.5	a.	What are Comparators? Classify the comparator.	8	L2	CO4
	b.	Illustrate the working principle of following comparators : i) Zeiss ultra optimeter i) Dial indicator.	12	L3	CO4

OR

Q.6	a.	Explain the working principle of LVDT and define 'null point'.	10	L2	CO1
	b.	With a neat sketch, illustrate the principle of autocollimator.	10	L3	CO1

Module – 4

Q.7	a.	Derive an expression for sensitivity of equal arm balance.	10	L3	CO1
	b.	Write a short note on preparation and mounting of strain gauges.	10	L4	CO1

OR

Q.8	a.	Illustrate the principle of Laser pick up displacement measuring device.	10	L3	CO1
	b.	Identify the different parts of ultrasonic flow meter and its applications.	10	L4	CO1

Module – 5

Q.9	a.	Derive an expression for vacuum pressure using McLeod gauge.	10	L4	CO1
	b.	Interpret the laws of thermocouple with suitable sketches.	10	L4	CO1

OR

Q.10	a.	Write short notes on : i) Laser vision ii) Universal measurement machine.	10	L3	CO1
	b.	What is Coordinate Measuring Machine (CMM)? List the applications of CMM.	10	L1	CO1
