

Model Question Paper-1/2 with effect from 2022-23 (CBCS Scheme)

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Fourth Semester B.E. Degree Examination Subject Title: Mechanical Measurement and Metrology

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			RBT	Marks
Q.01	a	Define: i) Accuracy ii) Precision iii) Loading effect iv) Calibration v) Error vi) Repeatability	L1	08
	b	Define the term Metrology as applied to the engineering industry. Explain the needs of metrology.	L2	06
	c	What is the significance of the measurement system?	L3	06
OR				
Q.02	a	Explain briefly primary and secondary transducers.	L1	06
	b	With a neat sketch, explain the Piezoelectric transducer.	L2	07
	c	Explain the working of a generalized measurement system with a block diagram.	L3	07
Module-2				
Q.03	a	Describe with a neat sketch, the constructional features of an "International Proto type writer"	L2	06
	b	Distinguish between line and end standards.	L3	07
	c	Discuss 'hole based' and 'shaft based' system of fits which is preferred why.	L2	07
OR				
Q.04	a	Define the terms: i) Limits ii) Tolerance iii) Allowance.	L1/L 2	06
	b	.With neat sketches explain different types of fit.	L3	06
	c	Write a short note on Interchangeability and Selective assembly.	L2	08
Module-3				
Q.05	a	Define comparator. What is need of a comparator?	L1, L2	06
	b	.With neat sketch and explain working of Pneumatic comparator	L3	07
	c	Sketch and explain working of LVDT.	L3	07
OR				
Q.06	a	With a neat diagram, explain the principle, construction and working of Sine center.	L1, L2	06
	b	With a neat sketch, explain the working of Optical flats.	L3	08
	c	With a neat sketch, explain the working of autocollimator.	L3	06
Module-4				
Q.07	a	With a neat sketch, explain working of Prony brake dynamometer	L2	06
	b	Write a note on preparation of mounting of Strain gauges.	L3	08
	c	Explain measurement of force using system unequal arm balance.	L3	06
OR				
Q.08	a	With a neat sketch, explain Ultrasonic flow meter.	L3	10
	b	With a neat sketch, explain Laser pickup for displacement measurement.	L3	10
Module-5				
Q.09	a	What is thermocouple? Give the laws of thermocouple.	L2	06
	b	With a neat sketch, explain the working principle of optical pyrometer.	L3,	07

			L4	
	c	With a neat sketch, explain Pirani gauge.	L3	07
OR				
Q.10	a	Explain with a neat sketch, Universal Measuring Machine. (UMM)	L2, L3	10
	b	Explain with a neat sketch, Coordinate Measuring Machine (CMM)	L3, L4	10

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Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			RBT	Marks
Q.01	a	Explain the working of generalized measurement system with block diagram taking one of the example.	L2,L3	08
	b	What is the significance of measurement system?	L2	06
	c	State and explain objectives of metrology.	L3	06
OR				
Q.02	a	Define: i) Accuracy ii) Precision iii) Sensitiveness iv) Calibration v) Repeatability	L1,L2	06
	b	Explain briefly primary and secondary transducers.	L2	08
	c	With a neat sketch, explain Capacitance transducer.	L3	06
Module-2				
Q.03	a	Describe with a neat sketch, the constructional features of an "Imperial standard yard"	L3	06
	b	Distinguish between line and end standards.	L3	08
	c	Write a short note on Hole basis and Shaft basis system.	L2	06
OR				
Q.04	a	Build up a length of 35.4875 using M12 set use two protector slips of 2.5mm each.	L3	06
	b	Write a short note on Interchangeability and Selective assembly.	L2	06
	c	Discuss the procedure for calibration of End Bars.	L3	08

Module-3			
Q.05	a	What is comparator? Give a list of various comparator and explain any one comparator.	L2,L3 08
	b	Define comparator. What is need of a comparator?	L1,L2 06
	c	With a neat sketch, explain Solex comparator.	L3 06
OR			
Q.06	a	With a neat diagram, explain the principle, construction and working of sine bar.	L2,L3 08
	b	With a neat diagram, explain Clinometer.	L2 08
	c	With a neat sketch, explain Optical comparator.	L3 06
Module-4			
Q.07	a	With a neat sketch, explain Velocimetry for velocity measurement.	L2,L3 08
	b	With a neat diagram, explain Piezo type force transducer.	L3 08
	c	What is transducer? Name the types of transducer with example.	L2,L3 04
OR			
Q.08	a	With a neat diagram, explain Eddy current dynamometer.	L3 10
	b	Write a note on preparation of mounting of Strain gauges.	L2,L3 10
Module-5			
Q.09	a	With a neat diagram, explain McLeod gauge.	L3 08
	b	With a neat sketch, explain the working principle of optical pyrometer.	L3 07
	c	What is thermocouple? Give the laws of thermocouple.	L2,L3 05
OR			
Q.10	a	Explain with a neat sketch, Coordinate Measuring Machine (CMM)	L3,L4 10
	b	Write a short note on i) Ultra Violet Recorders ii) Universal Measuring Machine.	L2,L3 10