

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fifth Semester**Mechanical Engineering***ME3592- Metrology and Measurements***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks**PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	List the basic components of a measurement system.	L1	1	2
2.	Differentiate between systematic error and random error with examples.	L2	1	2
3.	What is wringing of gauge blocks?	L1	2	2
4.	Define backlash and run-out in spur gears.	L2	2	2
5.	Describe the concept of interchangeability with examples.	L2	3	2
6.	State the uses of feeler gauges.	L1	3	2
7.	Identify the datum in GD&T.	L1	4	2
8.	Explain the factors affecting surface roughness.	L2	4	2
9.	What is computed tomography?	L1	5	2
10.	Summarize any four applications of artificial vision systems in manufacturing industries.	L2	5	2

*PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Define "Errors" and explain the causes of those errors with suitable examples.	L2	1	16
	Or			
	b i Discuss the sources of measurement uncertainty.	L2	1	8
	ii Explain the purpose of calibrating the instrument and discuss the primary and secondary calibration.	L2	1	8
12.	a Describe how a Solex pneumatic comparator operates with the help of a neat sketch and state its advantages.	L2	2	16
	Or			
	b Explain the working principle of an Angle Dekkor with the help of a neat sketch and state its applications.	L2	2	16
13.	a i Discuss Taylor's principle applied to limit gauges.	L2	3	8
	ii Write short notes on fits and types of fits.	L2	3	8
	Or			

	b	i	Elaborately discuss the process capability and tolerance stackup.	L2	3	8
		ii	Describe the meaning and effects of tolerance stack-up in engineering design.	L2	3	8
14.	a	i	Explain GD&T symbols.	L2	4	8
		ii	Define straightness. Describe any one method of measuring straightness of a surface.	L2	4	8
			Or			
	b	i	Explain with a neat sketch the working of Talysurf instrument for surface finish measurement.	L2	4	10
		ii	Write short notes on 3D surface measurement.	L2	4	6
15.	a		Construct a block diagram of an AC interferometer system for precision thickness measurement and demonstrate how the AC signal is processed to obtain accurate results.	L3	5	16
			Or			
	b		Demonstrate how machine vision can be applied in a bottling plant for inspection and quality control, and illustrate the system with suitable sketches.	L3	5	16