Vidyavardhini's College of Engineering and Technology, Vasai (West)

First Year Engineering

Academic Year: 2024-2025

Assignment Test-1:

Subject/Code: Elective Physics/BSC2023 **Date: 10/01/2025**

Max Marks: 10 **Duration: 1 Hr**

CO1: To provide students with a basic understanding of measurements in the field of basic engineering.

CO2: To explain the basic importance of interference in the field of measurements.

Q. No.	Questions	Marks	CO	CL
1	Explain any 3 of the following terms in mechanical measurements: (i) Relaiblity (ii) Callibration (iii) Sensitivity (iv) Systematic errors (v) Range (vi) Accuracy and Precision	3	1	2
2	A small population of $N = 8$ students scored the following marks in a physics test: $75, 80, 82, 70, 85, 90, 88, 76$. Calculate the population mean and population standard deviation.	2	1	1
3	What is an optical flat? Describe its application in checking the flatness of a surface using fringe patterns.	3	2	3
4	In an experiment to study Newton's second law of motion, a set of force **F** and acceleration **a** values are recorded for a given object of unknown mass. Due to experimental imperfections, a small correction factor **c** is introduced in the equation $F = ma + c$. The collected data points are: $(0.5, 2.5), (1.0, 4.8), (1.5, 7.3), (2.0, 9.7), (2.5, 12.1)$ Where the first value in each pair represents acceleration a (in m/s^2), and the second value represents force F (in Newtons). Using the principle of least squares, determine the best-fit values of m (mass) and c (correction factor).	2	1	3

NB: The beautiful thing about learning is nobody can take it away from you