



**SAKARYA UNIVERSITY
FACULTY OF
ENGINEERING/SCIENCE
2026-2027 FALL SEMESTER
PHYSICS-I LABORATORY
EXPERIMENT REPORT**

Department:

Name Surname - Signature:

**Group
Number:**

EXPERIMENT NO 3

EXPERIMENT TITLE : NEWTON'S LAWS OF MOTION

OBJECTIVE OF THE EXPERIMENT (10 points):

MEASUREMENTS AND CALCULATIONS

1) Specify the magnitudes of masses m_1 and m_2 . (5 points)

m_1 = ... g

m_2 = ... g

2) Fill the table below appropriately using the data you obtained. (10 points)

Point No "n"	m_1 mass			m_2 mass		
	$Y_n(\text{cm})$	$t_n(\text{sn})$	$t_n^2(\text{sn}^2)$	$Y_n(\text{cm})$	$t_n(\text{sn})$	$t_n^2(\text{sn}^2)$
0						
1						
2						
3						
4						
5						
6						

3) Draw the $y-t^2$ graph for mass m_1 on graph paper and find acceleration a_1 using the slope of this graph. (15 points)

4) Draw the $y-t^2$ graph for mass m_2 on graph paper and find the acceleration a_2 using the slope of this graph. (15 points)

5) Take the arithmetic mean of accelerations a_1 and a_2 for the experimental acceleration value. (5 points)

6) Calculate the theoretical acceleration value using the formula. Perform the % error calculation for the accelerations. (Take $g=980 \text{ cm/s}^2$) (10 points)

$$a = \frac{(m_2 - m_1)g \sin \phi}{m_1 + m_2}$$

7) Calculate the experimental value of the gravitational acceleration using the formula below, and perform the % error calculation for the gravitational accelerations by taking the theoretical value as $g=980 \text{ cm/s}^2$ (10 points)

$$g_{\text{deneysel}} = \frac{a_{\text{deneysel}} (m_2 + m_1)}{(m_2 - m_1) \sin \phi}$$

8) Calculate the magnitude of the tension force in the string using the formula $T = \frac{2m_2m_1g\sin\phi}{m_1+m_2}$
(Use **g experimental**) (10 points)

9) Interpret the results obtained in the experiment. (10 points)