Experimental General Physics for Engineers I

**Laboratory Report** PHYS 192 spring 2022

Section: L06\_\_\_\_\_

Experiment name: Static equilibrium

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| --- | --- |
| Table of results (1.25 pts) |  |
| Graph (1.25 pts) |  |
| Data analysis (2 pts) |  |
| Discussion (0.5 pt) |  |
| References |  |
| Others |  |
| **Report Grade (5 pts)** |  |

1. Tables of results (Put correct units in the table)
   1. Part 1

m= 100g=0.1kg R2= 12 cm=0.12m = 90

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (m) | (m) | (N) | (N) |  |
| 0.12 | ±0.001 | 0.98 | ±0.01 | 0.1176 |
| 0.09 | ±0.001 | 0.71 | ±0.01 | 0.0852 |
| 0.06 | ±0.001 | 0.44 | ±0.01 | 0.0528 |
| 0.03 | ±0.001 | 0.21 | ±0.01 | 0.0252 |

* 1. Part 2

R1= 9 cm=0.09m R2= 6cm =0.06m =90

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (kg) | (N) | (N) | **(N)** | (Nm) | (Nm) |
| 0.03 | 0.294 | 0.42 | ±0.01 | 0.0252 | 0.000732 |
| 0.04 | 0.392 | 0.55 | ±0.01 | 0.0330 | 0.000814 |
| 0.05 | 0.49 | 0.69 | ±0.01 | 0.0414 | 0.000914 |
| 0.06 | 0.588 | 0.83 | ±0.01 | 0.0498 | 0.001024 |

1. Graphs

Insert the graphs of andhere

1. Data analysis
   1. Error of

U(= sqrt((R2\*U(F2)^2)+(F2\*U(R2)^2)

= sqrt((0.06\*0.01^2)+(0.42\*0.001^2)

= ± 0.000732 Nm

* 1. Slope, intercept and their uncertainties

Give the values for the slope, intercept of your graphs and their uncertainties

For the first Graph

|  |  |
| --- | --- |
| Slope(N): 1.032 | Intercept (N.m) -0.0072 |
| Slope Error(N): 0.027713 | Intercept Error (N.m) : 0.002277 |
|  |  |

For the Second Graph

|  |  |
| --- | --- |
| Slope(m): 0.093061 | Intercept (N\*m) -0.00324 |
| Error Slope(m): 0.005337 | Intercept Error(N\*m) - 0.002718 |

* 1. Compare the value of the slope you obtained in the two parts with the expected value.

|Theoretical value – obtained value / theoretical value| \*100

**Part 1:**

T=mg R1

Slope =mg

Slope =1.032 mg=0.1\*9.81=0.981 N

Error = |0.981-1.032 / 0.981 | = 5.19%

**Part 2:**

T= R1 mg slope=R1

Slope=0.093 R1=0.09

Error=|0.09-0.093/0.09| = 0.3%

1. Discussion

The theory was satisfied, and the results obtained are with reasonable error percentages.

Reasons of error could be human error with experiment especially when the angle is measured, also trying to keep it 90 in both parts. Some angle changes could cause some errors.

Overall, the experiment is successful with low error percentages for both the parts

References