Question 1 **[10]**

Using the materials provided, determine the value of acceleration due to gravity of your place using a simple pendulum. You are expected to provide information on the following components of your experiment in the format given below:

i. Aim of the experiment

ii. Hypothesis

iii. Theory *(only working formula)*

iv. Principle

v. Materials required

vi. Procedure

vii. Observations *(Show your first set of readings to Visiting Examiner)*

viii. Calculation

ix. Result

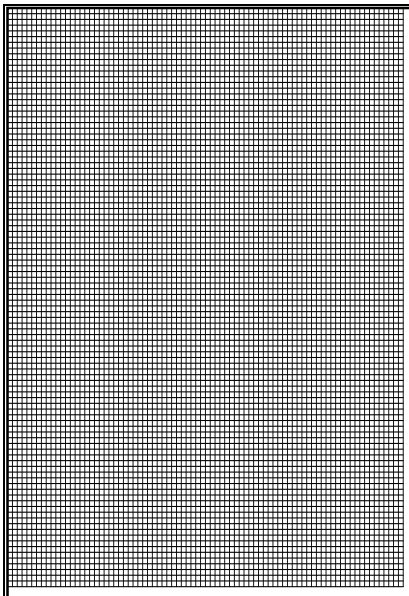
x. Conclusion *(Do not mention the name of your place)*

xi. Verification of hypothesis

xii. Answer the following questions.

a. If we change the mass of the bob keeping the length of the thread constant, what will happen to the time period?

b. Can you suggest a way of carrying out the above experiment in a shorter period of time with equal number of readings?



Question 2 **[10]**

Determine the focal length of the given convex lens by u-v method. You are provided with the required materials and the procedure to carry out this experiment. Follow the procedure correctly and perform the experiment. **DO NOT** copy the materials required and procedure of the experiment. You are expected to present only the findings.

Materials required:

- A convex lens
- A lens holder
- Two optical pins
- Two pin holders
- An optical bench
- A meter scale

Set up

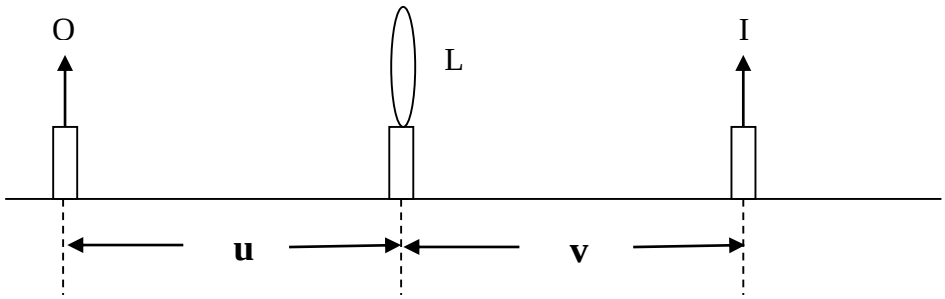


Figure 1. u-v method

Procedure:

Step 1. Write the hypothesis for the experiment.

Step 2. Note down the range and least count of the optical bench.

Step 3. Find the mean approximate focal length of the given convex lens and record it up to three significant figures.

Step 4. Arrange the lens between the object pin 'O' and image pin 'I' on an optical bench such that the tips of the pins and the optical centre of the lens are at the same height above the bench, as shown in Figure 1.

Step 5. Keep the object pin 'O' near one end of the optical bench. Adjust the position of the lens and the image pin 'I' so that a clear inverted image of the object pin is seen looking from the other end. The image should be nearly of the same size as the object.

Step 6. By adjusting the position of the lens or image pin or both, remove the parallax between the image pin 'I' and the inverted image of object pin 'O'. Record the positions of O, L and I along with u = L−O, v = I−L and $f = \frac{uv}{u+v}$ up to three significant figures and with proper units in Table 2.1: Focal length of convex lens. *(Show the first set of reading to the visiting examiner).*

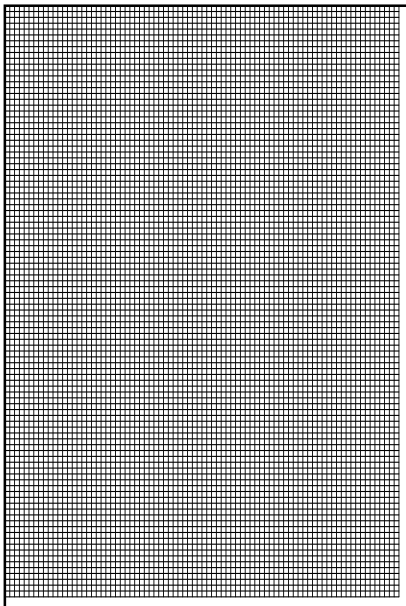
Step 7. Repeat the above experiment two more times by increasing the value of ***u*** about by 4 cm each, moving the lens towards the right. Avoid distortion of the image.

Step 8. Repeat two more sets of observations by decreasing the values of ***u*** by about 3 cm each moving the lens towards the left, from its first position. Tabulate all the five sets of observations up to three significant figures.

Step 9. Find the mean of the focal length up to three significant figures.

Step 10. Write the result of your experiment.

Step 11. Verify your stated hypothesis.



Rough Work

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