

WAKISSHA JOINT MOCK EXAMINATIONS
SCORING GUIDE
 Uganda Certificate of Education
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PHYSICS 535/2



ITEM 1

Aim : Determine the mass of 6 inch nail and the cost of 20 six inch nails

Hypothesis: The nail should have a mass in the range in 30.0 to $\frac{1}{40.0g}$ 40.0g

Apparatus; Meter rule, knife edge, standard mass, 6 inch nail, thread.

Procedure;

- (i) Place a meter rule on a knife edge and adjust its position until it balances. Mark that point as G.
- (ii) With the meter pivoted at G, suspend a standard mass of 50g at a distance, d of 10.0cm from G.
- (iii) Suspend a 6 inch nail on the other side and adjust its position until the meter rule balances again.
- (iv) Read and record the distance, d, from the 6 inch nail to G.
- (v) Repeat ii to iv for d = 15.0cm, 20.0cm, 25.0cm and 30.0cm.

Variables

Independent; d – Distance between standard mass and G.

Dependent; d_1 – Distance between 6 inch nail and G.

Controlled; Pivoting of the meter rule.

Sources of error

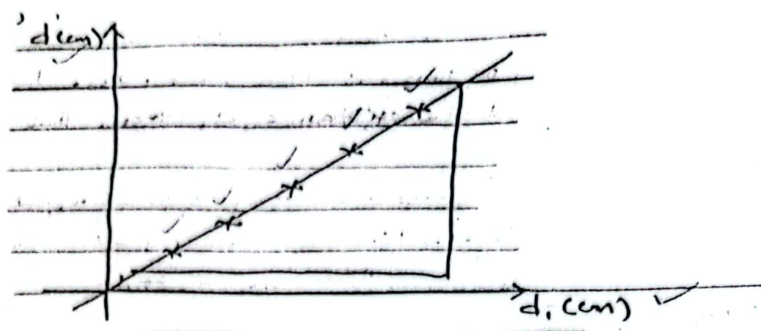
- ✓ Errors due to parallax.
- ✓ Failure of meter rule to balance due to wind.
- ✓ Bending of the meter rule.

Precautions

- ✓ Reading the scale from directly above it.
- ✓ Shielding the apparatus from wind.
- ✓ Using a firm meter rule.

d (cm)	d_1 (cm)
10.0	16.6
15.0	25.3
20.0	33.7
25.0	41.3
30.0	49.4

✓ A graph of d against d_1



$$\text{Slope} = \frac{49.4 - 16.6}{30.0 - 10.0} = \frac{32 - 8}{20.0} = 1.64$$

$$M = \frac{m}{s}$$

$$= \frac{50}{1.64} = 30.5g$$

Mass of 20 nails = $20 \times 30.5g = 610g$.

Cost = $\frac{610}{1000} \times 5500 = \text{Shs. } 3355$.

ITEM 2

The lens has a focal length that lies between 8.0cm and 12.0cm.

Apparatus; source of light – Ruler – White screen.

Meter rule – convex lens.

Procedure:

- (i) Arrange the apparatus as shown.
- (ii) Close the switch.
- (iii) Set the distance U between the wires and lens to 30.0cm
- (iv) Adjust the position of the screen such that a sharp image is formed on the screen.
- (v) Measure the distance V between the lens and the screen.
- (vi) Repeat iii to V for $U = 40.0\text{cm}$, 50.0cm and 60.0cm .

Variables:

Independent; object distances, U

Dependent; image distance, V

Controlled; brightness of the room.

Sources of error.

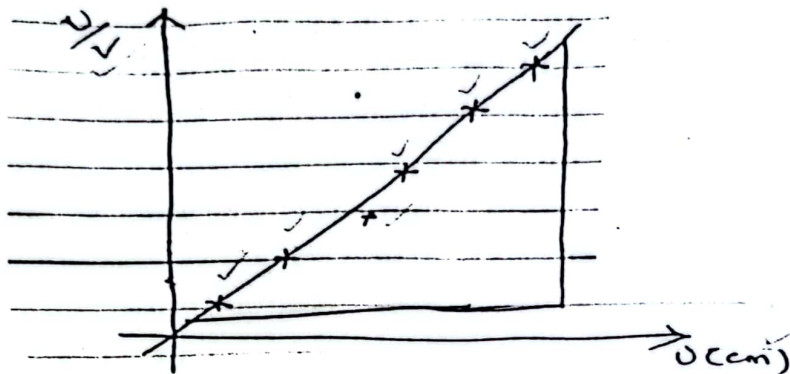
- ✓ Parallax when taking readings.
- ✓ Too much light in the affecting the brightness of the image.

Precautions taken.

- ✓ Reading the scale from directly above it.
- ✓ Putting dark curtains in the room.

Table of values

A graph of u/v against u



$$\text{Slope} = \frac{5.04 - 1.97}{60.0 - 30.0}$$

$$= \frac{3.07}{30.0}$$

$$= 0.102 \text{ cm}^{-1}$$

$$f = \frac{1}{s} = \frac{1}{0.102} = 9.80 \text{ cm}$$

The lens can be used in the projector because its focal length is in the recommended range.

END