

# **FORM THREE TERM ONE EXAM 2017**

**PHYSICS PRACTICAL**  
Paper 3  
2 ½ hours  
**FORM THREE**

**SCHOOLS NET KENYA**

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**Question 1.**

**PART A**

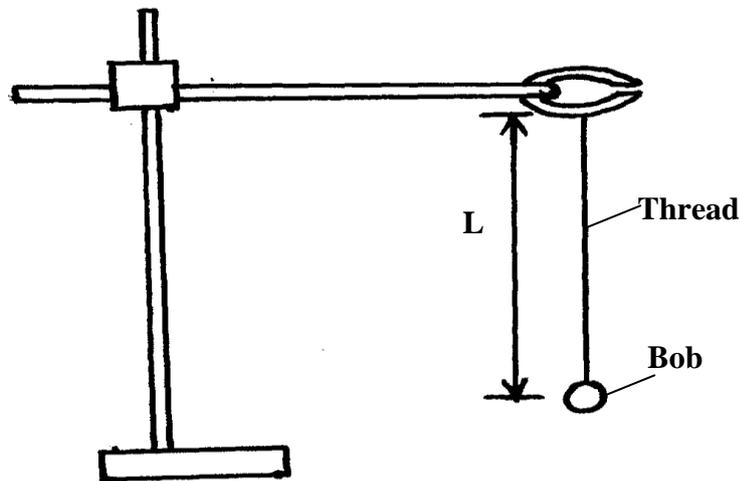
*You are provided with the following*

- A pendulum bob
- A stop watch
- A metre rule
- A retort stand, boss and clamp
- A piece of thread about 1.1m long

**Proceed as follows.**

- a) Set up the apparatus as shown in figure 1 below.

Fig 1



- (b) Set the length,  $L$ , to be 1.0m. Displace the bob slightly through a small angle measure and record in table 1 the time,  $t$ , for 10 complete oscillations.

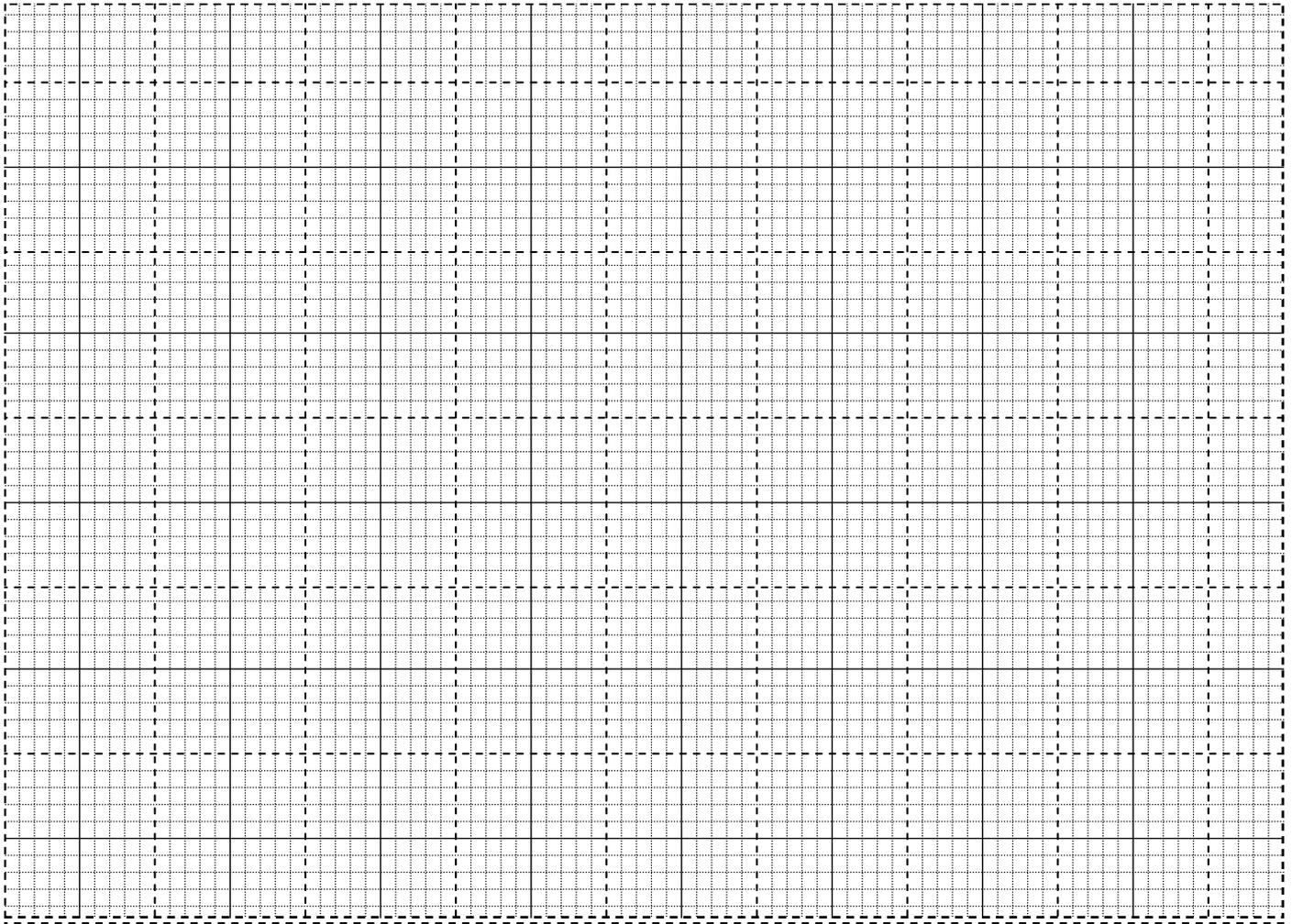
- (c) Repeat the procedure in (b) for other values of  $l$  as shown in table 1. Complete the table

Table 1.

Length, $L$ (m)	1.0	0.9	0.8	0.7	0.6	0.5
Time $t$ for 10 oscillations (s)						
Period, $T = t/10$ s						
Frequency, $f$ (Hz)						
$f^2$ (Hz) <sup>2</sup>						
$\frac{1}{L}$ (m <sup>-1</sup> )						

- d(i) plot a graph of  $f^2$  ( y-axis) against  $1/L$

(4mks)



(ii) Determine the slope of the graph.

(2mks)

(iii) Given that the equation of the graph is

$$F^2 = \frac{g}{4\pi^2 L}$$

Determine the value of  $g$ .

(2mks)

(iv) Use your graph to determine the value of  $T$  when  $I/L = 1.5 \text{ m}^{-1}$

(2mks)

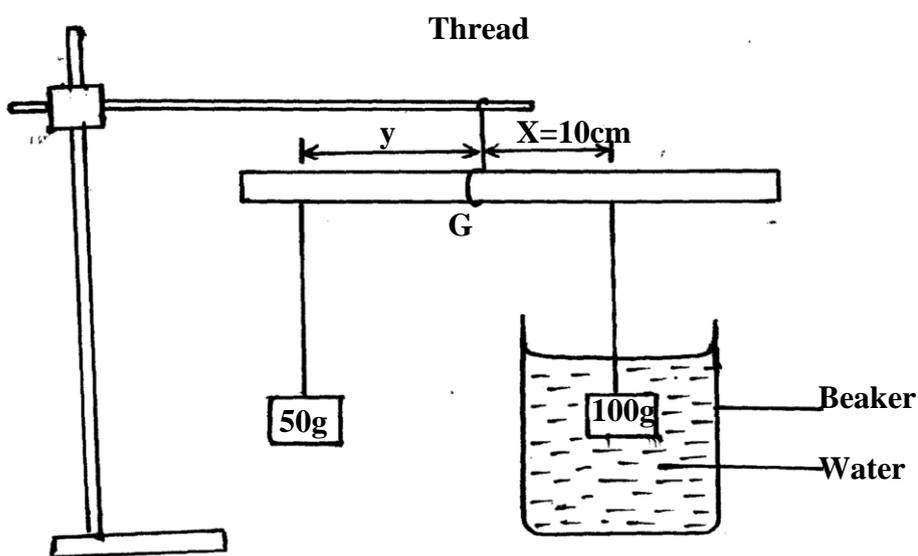
## PART B

*You are provided with the following*

- A metre rule
- A retort stand, bass and clamp
- 500ml beaker  $\frac{3}{4}$  full of water
- 100g mass
- 50 Mass
- Three pieces of thread.

**Proceed as follows**

- (e) Using a piece of thread suspend the metre rule from the clamp on the stand and adjust the position of the thread until the metre rule balances horizontally. Note this position **G** of the metre rule.
- (f) Suspend the 100g mass from the metre rule such that  $x = 10\text{cm}$  from **G**. with the 100g hang the 50g mass from the metre rule and adjust its position until the metre rule balances once more.



Record the value of  $y$

$Y = \dots\dots\dots\text{cm}$  ( 1mk)

- (g) Use the principle of moments to determine the weight  $w_1$  of the 100g mass in water hence determine the upthrust  $U_w$  in water ( Take  $g = 10\text{N/Kg}$ )

$W_1 = \dots\dots\dots$  ( 1mk)

$U_w$  (1mk)

**Question 2**

**Part A**

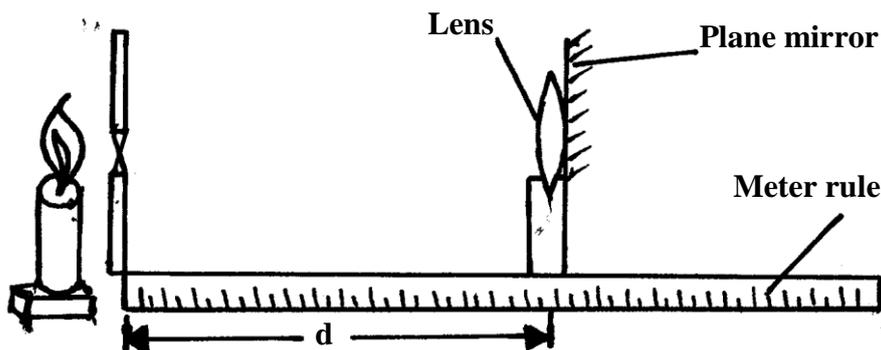
*You are provided with the following*

- A candle

- A plane mirror
- A metre rule
- A biconvex lens
- A lens holder
- A cardboard with cross wire at its centre
- A white screen
- Some cellotape

**Proceed as follows:**

- A (a) Attach the plane mirror to the lens using the cellotape.  
 Arrange the apparatus as shown in the figure below.

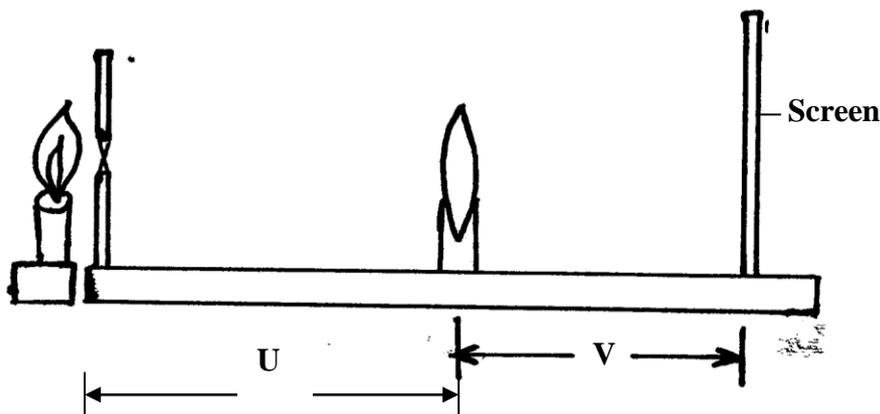


Ensure that the candle flame is at the same height as the cross wires.

- (b) Place the cardboard with the cross wires at the 0 cm mark. Move the lens along the metre rule until a sharp image of the cross wires is formed along side the object cross wires. Measure the length,  $d$

$D = \dots\dots\dots$  cm ( 1mk)

- (c) Now set the apparatus as shown below



- (d) Set  $u = 20$ cm and adjust the screen until a clear image of the cross wires appears on the screen. Measure the distance,  $v$  and record in the table Z below.

- (e) Repeat the procedure (d) for other values of  $u$  and complete the table.

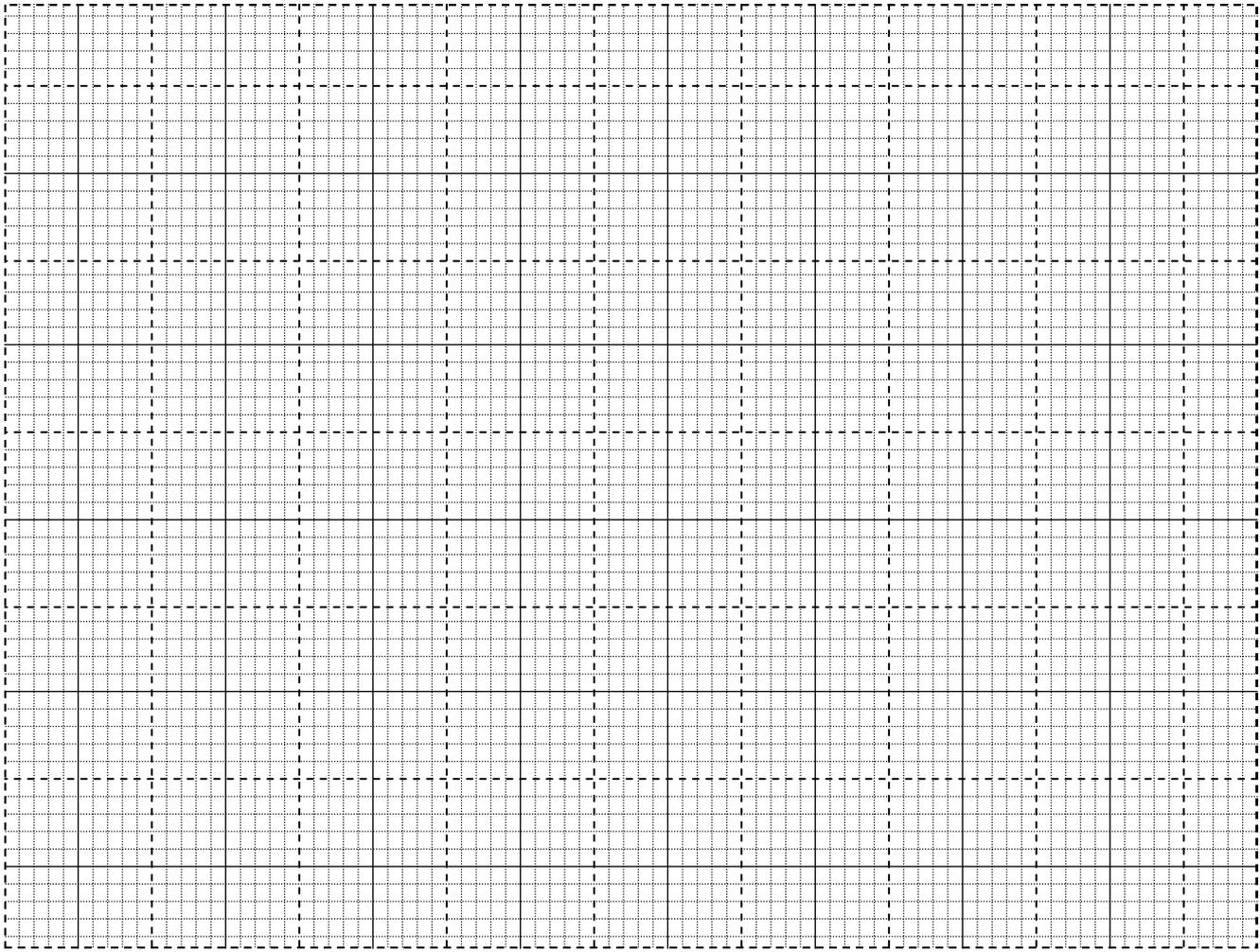
U (cm)	20	25	30	35	40	50
V (cm)						

$M = \frac{y}{u}$						
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(6mks)

(f) Plot the graph of  $m$  (y-axis) against  $V$

(4mks)



(g) Determine the slope of the graph

(2mks)

(h) Given that the equation for the graph is given by the equation

$$m = \frac{y}{n} - 1 \text{ where } \mathbf{n} \text{ is a constant, determine the value of } \mathbf{n}.$$

(2mks)

(i) Find the value of  $\mathbf{n}$  when  $\mathbf{m} = \mathbf{0}$

(1mk)

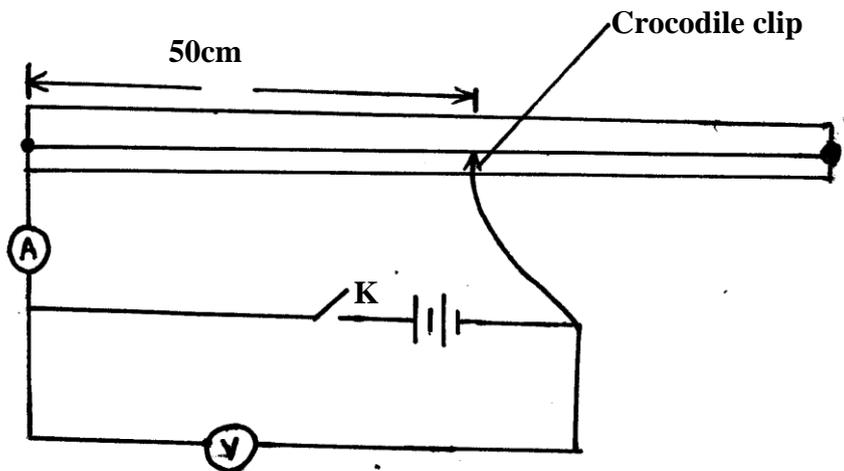
**Part B**

**You are provided with the following**

- Resistance wire mounted on a millimeter scale
- A voltmeter
- An ammeter
- Two new dry cells
- Six connecting wires , at least two with crocodile clips
- A switch.

**Proceed as follows**

(i)Set up the circuit as shown in the figure below



(a) Remove the crocodile clip from the resistance wire **PQ** and close the switch **k**. Read and record the voltmeter reading **E**

**E** = ..... volts (1mk)

(b) Attach the crocodile clip to the resistance wire such that  $l = 50\text{cm}$ . Read and record the voltmeter and ammeter reading when the switch is closed.

Voltmeter reading , **V** = .....volts ( 1mk)

Ammeter reading, **I** ..... (1mk)

(m) Given that  $v = \frac{MR}{E-V}$  where  $\frac{R}{5} = \frac{V}{I}$  ( 2mks)

Determine the value of **m**.