MASENO SCHOOL MOCK – 2022

Kenya Certificate of Secondary Education

232/3 **Paper 3**

PHYSICS

Practical

Sept. 2022 – 2½ hours

Name …… Admission Number ……

Class …… Date ……Candidate's Signature……...

Instructions to candidates

a) *Write your name and admission number in the spaces provided above.*

b) *Write your class, the date of examination and sign in the spaces provided above.*

c) *Answer **all** the questions in spaces provided in the question paper.*

d) *You are supposed to spend the first 15 minutes of 2½ hours allowed for this paper reading the whole paper carefully before commencing the work.*

e) *Marks are given for clear record of the observations actually made, their suitability, accuracy and the use made of them.*

f) *Candidates are advised to record their observations as soon as they are made.*

g) *Mathematical table and electronic calculators may be used.*

h) ***This paper consists of 7 printed pages.***

i) ***Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.***

j) ***Candidates should answer the questions in English.***

FOR EXAMINER'S USE ONLY

Question 1	e	f	g	i	m
Maximum Score	7	2	1	7	3
Candidate's Score					

TOTAL	

Question 2	c	d	e	f
Maximum Score	9	5	3	3
Candidate's Score				

TOTAL	

GRAND TOTAL

QUESTION ONE.

PART A.

You are provided with the following:

- A rectangular glass block.
- 4 optical pins.
- A soft board.
- A plain paper.

Proceed as follows:

(a) Place the glass block on the plain paper with one of the largest face upper most. Trace round the glass block using a pencil as shown in ***Figure 1*** below.

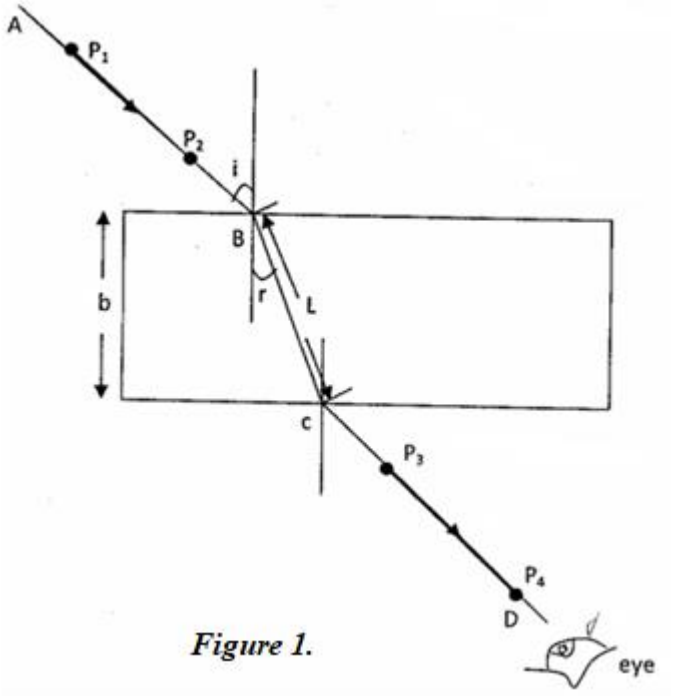


Figure 1.

(b) Remove the glass block and draw a normal at ***B***. Draw an incident ray ***AB*** of angle of incidence, **i = 30°.**

(c) Replace the glass block and trace the ray ***ABCD*** using the optical pins.

(d) Remove the glass block and draw the path of the ray ***ABCD*** using a pencil. Measure length **L** and record it in **table 1** below.

(e) Repeat the procedure above for the angles of incidence given and complete the table. ***(7marks)***

Table. 1

Angle i°	L(cm)	$L^2(cm^2)$	$\frac{1}{L^2}\left(cm^{-2}\right)$	Sin^2 i	$\frac{\frac{1}{L^2}}{sin^2 i}$
30					
40					
50					
60					

(f) Determine the average of $\frac{\frac{1}{L^2}}{sin^2 i}$ ***(2marks***)

(g) Hand in your constructions on the plain paper together with the answer script. ***(1mark)***

PART B.

You are provided with the following apparatus:

- Two retort stands
- Two bosses
- A meter rule
- A pendulum bob
- A piece of cotton thread
- A stop watch or stop clock

Proceed as follows;

(h) Tie the thread provided to the pendulum bob securely so that it is at the center of the thread (put the thread through the whole or loop of the bob up to the Centre and then make a knot).

(i) Use your pen to mark on the loose ends of the thread, points ***A*** and ***B 50cm*** from the point where the bob is tied.

(j) Fix the bosses on the stands at points ***60cm*** above the bench. Suspend the bob between the two stands by tying the loose ends of the thread to the bosses at the points marked in ***(h)*** above. See ***figure 2*** (**A** and **B** are the marked points).

Turn over

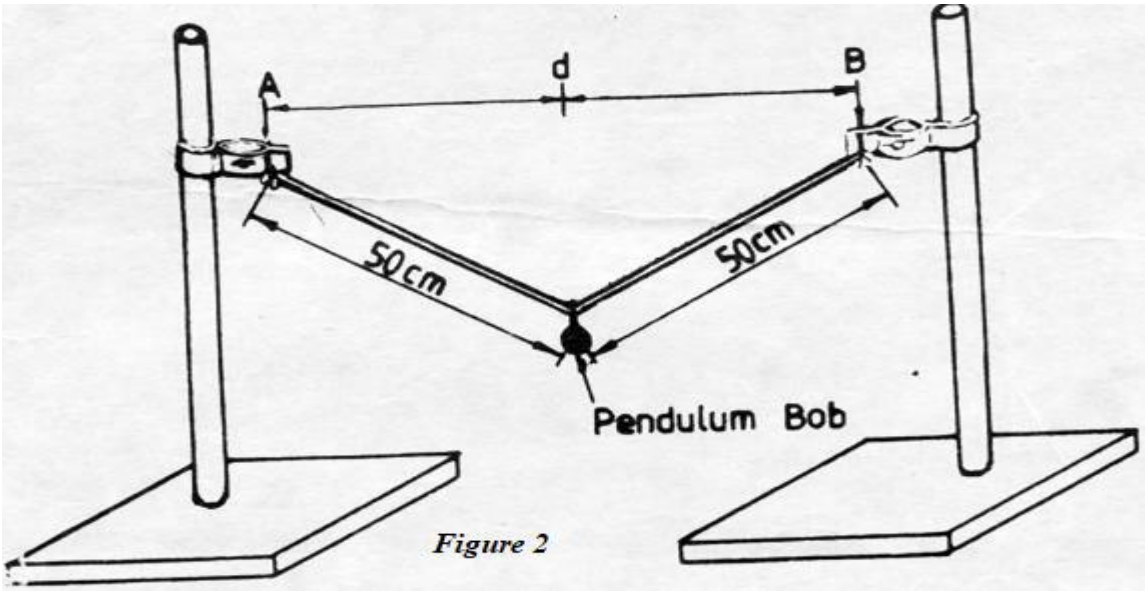


Figure 2

(k) Adjust the position of one of the stands (by moving it closer to the other), so that the distance ***d*** is ***50cm.*** Give the bob a small displacement perpendicular to the plane containing the two portions of the thread and then release it. Measure the time for ***10 oscillations.*** Repeat the measurement and record in the ***table 2*** below.

(l) Repeat the procedure in (k) for other values of ***d*** shown in the table and complete the table.

(7marks)

Table 2.

Distance d(cm)	50	55	60	65
Time to for 10 oscillations (s)				
Periodic time T (s)				
$T^2(s^2)$				
$\frac{d}{T^2}$				

(m) Determine the average of $\frac{d}{T^2}$ ***(3marks)***

QUESTION TWO

You are provided with the following apparatus:

- 2 size D dry cells.
- 100cm nichrome wire on a mm scale.
- A bulb (2.5v) and a bulb holder.
- 8 connecting wires (at least 4 with crocodile clips).
- Cell holder.
- A switch.
- A voltmeter (0 – 3V).
- An ammeter (0 – 1A).
- A jockey.

Proceed as follows;

(a) Connect the apparatus provided as show in ***Figure 3.*** below.

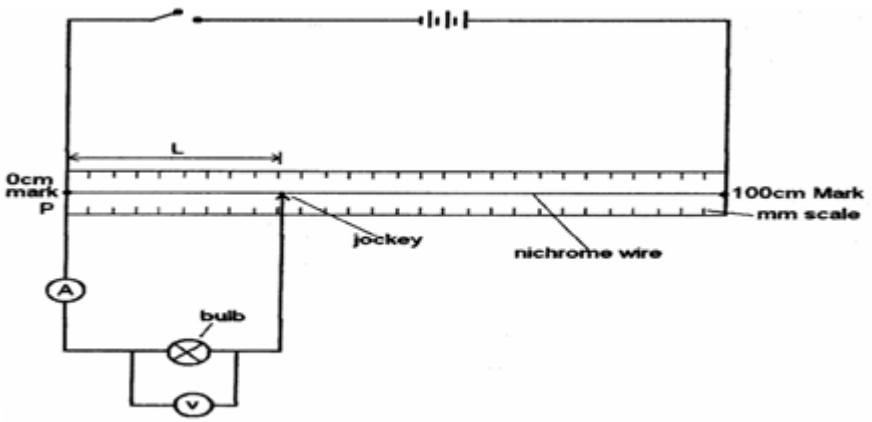


Figure 3.

(b) Place the jockey at **L = 20cm** from **P**, then close the switch.
Record the ammeter reading and the voltmeter reading in ***Table 3.*** below.

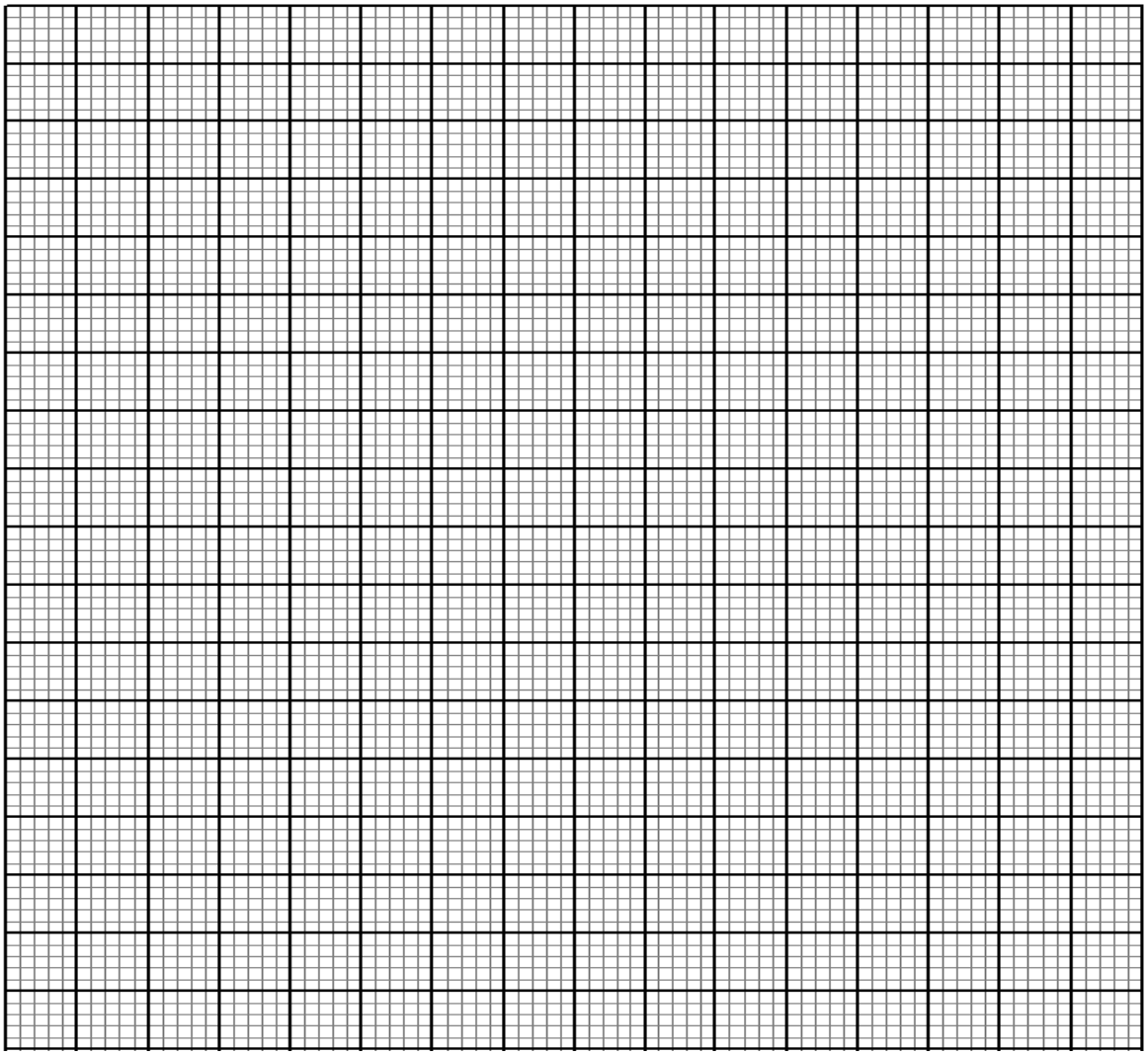
(c) Repeat the experiment by placing the jockey at ***L= 40, 60, 70*** and ***80cm*** from ***P.***
Record your readings and complete the table. ***(9marks)***

Table 3.

Length L(cm)	1(A)	Pd V(v)	1(mA)	Pd V(mV)	Log 1(mA)	Log V (mV)
20						
30						
40						
50						
60						
80						

Turn Over

(d) Plot a graph of ***log I (mA)*** (y-axis) against ***log V(mV)*** ***(5 marks)***



(e) Determine the slope of the graph. ***(3marks)***

(f) Given that ***Log I = n log v + log k*** where **k** and **n** are constants of the lamp. Determine using your graph the value of **k** and **n.** ***(3marks)***

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