KCSE MOCKS

PHYSICS PAPER 3

Consists 3 KCSE Mock set Exams.

(Class of KCSE March 2021)

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PRE-MOCK 1

PHYSICS CONFIDENTIALS.

QUESTION ONE

- ✓ meter rule.
- ✓ electronic beam balance (shared)
- ✓ vernier callipers (shared)
- ✓ measuring cylinder
- ✓ boiling tube.
- ✓ A wire mounted on a millimetre scale labelled AB(use a wire of diameter 0.45mm)
- ✓ A galvanometer.
- ✓ Jockey
- ✓ A carbon resistor labelled X .(10 ohm carbon resistor)
- ✓ 8 Connecting wires, 4 with crocodile clips at both ends.
- ✓ A resistance wire labelled R mounted on a half meter rule(use a wire of diameter 0.45mm fixed on half metre rule)
- ✓ Ammeter (range 0-1)
- ✓ Voltmeter (range 0-5 or 0-2.5)
- ✓ One dry cell in a cell holder
- ✓ Micrometer screw gaug

QUESTION TWO

- ✓ Soft board
- ✓ Vernier calipers.
- ✓ Rectangular Glass block of width 6.50 cm
- ✓ Four optical pins.
- ✓ Plain sheet of paper.
- ✓ Two thumb tacks
- ✓ Protractor

- A metre rule
- Two Half metre rules
- Stop watch
- A complete retort stand
- Two pieces of thread.(each 60cm) –preferably use a laboratory thread.
- Some cellotape

PRE-MOCK 1

Name…… Index No…….....

Candidate's signature.....
Date.....

232/3
PHYSICS PRACTICAL
Paper 3
$2\frac{1}{2}$ hours

KCSE PRE-MOCK 1

Kenya Certificate of Secondary Education (K.C.S.E)
PHYSICS
(PRACTICAL)
Paper 3

Instructions to Candidates

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of examination in the space provided above.
*(c) Answer **all** questions on the question paper.*
(d) You are supposed to spend the first 15 minutes allowed for this paper reading the whole paper carefully before commencing your work and confirming your apparatus.
(e) Marks are given for a clear record of the observations actually made, their suitability, accuracy and for the use made of them.)
(f) Candidates are advised to record observations as soon as they are made
(g) Mathematical tables and Electronic calculators may be used
(h) Candidates should answer the questions in English

For Examiner's Use Only

Question	Maximum	Candidates Score
1	20	
2	20	
Total		

QUESTION ONE

Part A

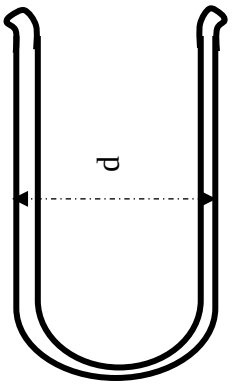
You are provided with the following apparatus.

- meter rule.
- electronic beam balance (shared)
- vernier callipers (shared)
- measuring cylinder
- boiling tube.

Proceed as follows;

(a) Measure the length l of the boiling tube provided using a metre rule

l = ……..(1mark)



(b) Measure the external diameter d of the boiling tube at the middle using a Vernier callipers.

. d=…… (1mark)

(c) Calculate the external volume of the boiling tube. $V_1 = \frac{11d^2l}{14}$ (1mark)

……

……

……

……

(d) Completely fill the boiling tube with water. Pour the water into the measuring cylinder Read and record the volume V_2 of the water.

V_2 = …….. ……. (1mark)

(e) Calculate the volume V_3 of the glass used to make the boiling tube. (1mark)

……

(f) Using the electronic balance measure the mass of the boiling tube

Mass =……kg (1mark)

(e) Determine the density of the glass. (1mark)

……

……

……..

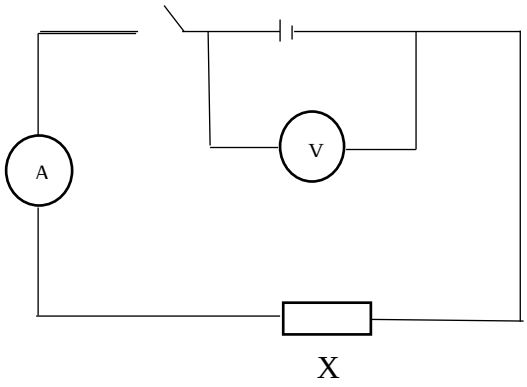
PART B

You are provide with the following

- A wire mounted on a millimetre scale labelled AB
- A galvanometer.
- Jockey
- A carbon resistor labelled X .
- 8 Connecting wires, 4 with crocodile clips at both ends.
- A resistance wire labelled R mounted on a half meter rule
- Ammeter
- Voltmeter
- One dry cell in a cell holder
- Micrometer screw gauge

Proceed as follows:

(a) Set up the circuit as shown below.



(i) Record the voltmeter reading when the switch is open.

E = …… (1mark)

(ii) Close the switch and record the voltmeter and ammeter readings V and I.

V = …… (1mark)

I = …… (1mark)

(iii) Explain why V is less than E . (1mark)

……
……
……

(iv) Now connect the voltmeter across the carbon resistor X and record voltmeter reading V_1 when the switch is on.

V_1 = ……. (1mark)

(v) Determine X given that $X = \frac{V_1}{I}$ (1mark)

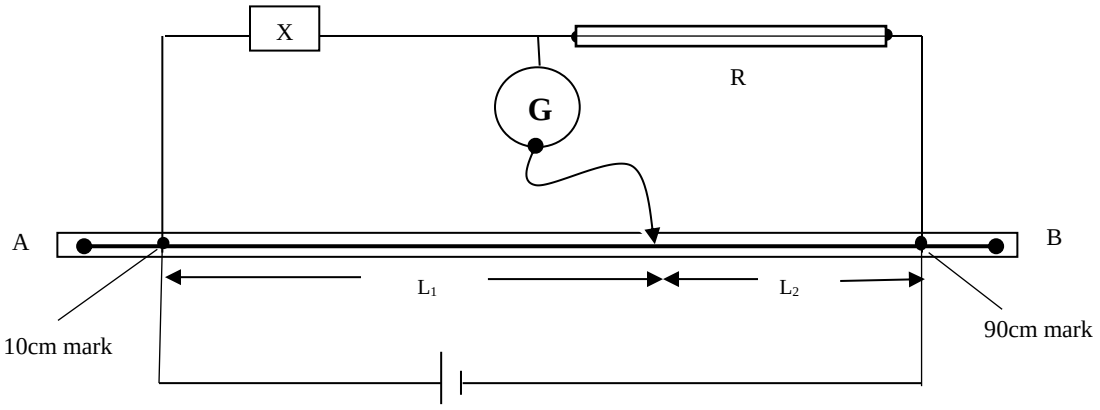
……
……

……..

(b) Using the micrometre screw gauge, measure and record the diameter D of the resistance wire R provided

D =……m (1mark)

(c) Now connect another circuit as shown in the figure below.



Touch the 10cm mark and the 90 cm mark and see that the galvanometer deflects in opposite direction in each case.

(i)Move the sliding jockey along the resistance wire AB and note the length L_1 and L_2 where the galvanometer pointer points at the zero mark. Record the values of L_1 and L_2.

L_1 =……m (1mark)

L_2 =…… m (1mark)

(ii) Determine the resistance of the resistance wire R using the relationship, (2marks)

$$\frac{R}{L_1} = \frac{X}{L_2}$$

……

……

……

(iii)Determine the resistance of the wire R per metre. (1 mark)

……

……

(iv)Given that, R = $\frac{0.1114S}{D^2}$ determine the value of S , where R is the resistance per metre. (1mark)

……

……

……

……

..

QUESTION TWO
PART A

You are provided with the following;

- Soft board
- Vernier calipers.
- Rectangular Glass block
- Four optical pins.
- Plain sheet of paper.
- Two thumb tacks
- Protractor

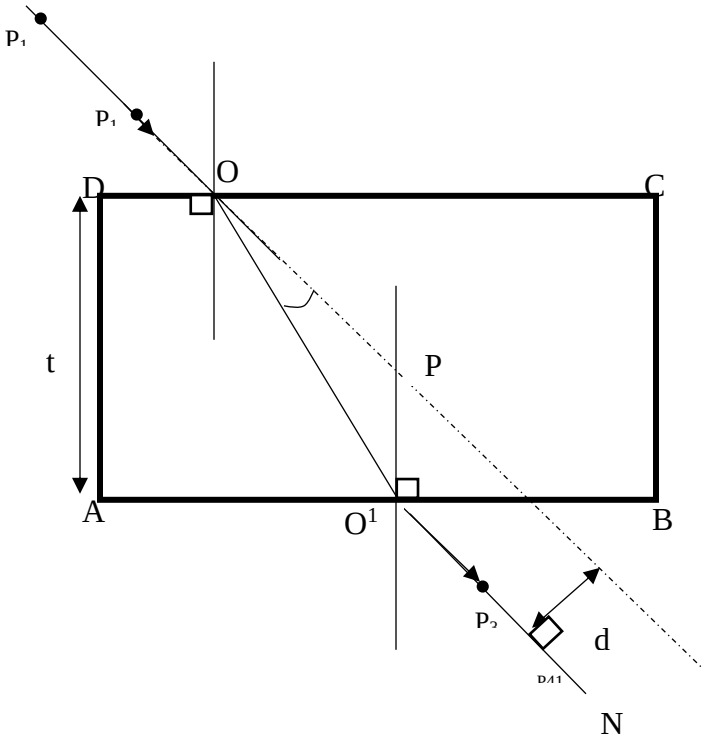
Procedure;

(a) Measure and record the width t of the glass block using the vernier calipers provided.

t = …… (m) (1 mark)

Fix the white plain paper on the soft board using the two thumb tacks.
Place the glass bock on the paper, trace its outline and label it ABCD ,as shown.

Remove the glass block and draw a normal, say at point O.
Draw a line making an angle of 30^0 with the normal to represent the incident ray.
Replace the glass block carefully to its original position.
Fix two pins P_1 and P_2 on the line in such a way that they are vertical and at least 4cm apart.
Looking through the glass block through face AB, fix two pins P_3 and P_4 so that they are exactly in line with the P_1 and P_2. Mark the positions of P_3 and P_4



Join P_3 and P_4 and produce the line to meet face AB of the block at O^1. Join O and O^1. Measure angle O^1OP.
Also, Measure anlge OO^1P.

(b) O^1OP =
……
(1mark)

(c) OO^1P =
……...
(1mark)

Measure the perpendicular distance d from the line O^1N to OP produced.

(d) d = …… (m)
(1mark)

(e) Determine t_1 given that ,$t_1 = \frac{dcos\ angle(OO^1P)}{\sin angle(O^1OP)}$.
(2marks)

……

……

……

(f) How do the values of t and t_1 compare .

(1mark)

……

……

……

NB. The worksheet should be handed in with the question paper.

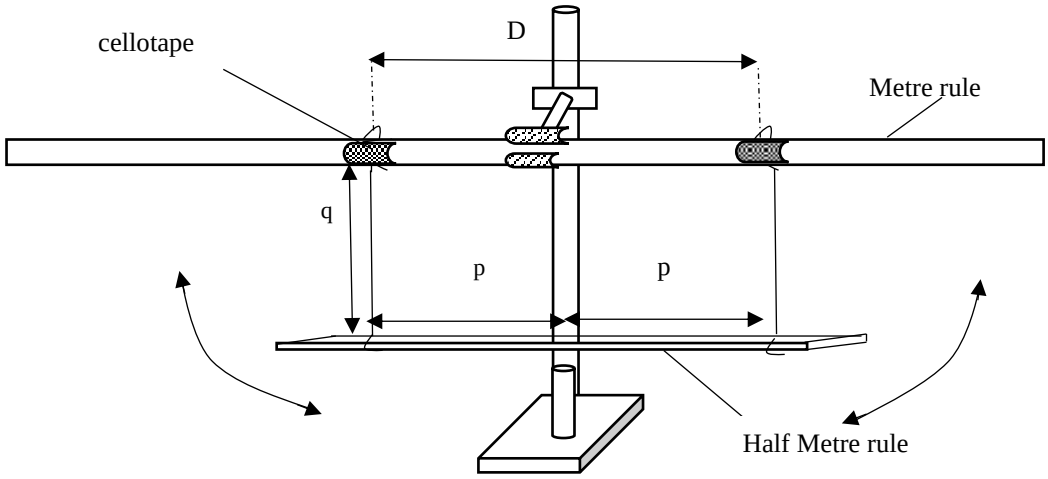
PART B

You are provided with the following:

- A metre rule
- Two Half metre rules
- Stop watch
- A complete retort stand
- Two pieces of thread.
- Some cellotape

Proceed as follows:

(a) Set up the apparatus as shown in figure below such that D = 2p = 20cm and q = 20cm. **Ensure that D is kept constant throughout the experiment.** (use a piece of cellotape to fix the threads).
Make sure that the loops of thread on the half metre rule can slide along the half metre rule. This would enable easy adjustments of distance p later in the experiment. The scale of the half metre rule should be kept in a horizontal plane.



The distance p is measured from the centre of the half metre rule.

(b) Adjust the position of the loops on the half metre rule so that p = 21cm. (ie 2p = 42cm). You may use a cellotape to keep the loop in position. Measure and record in table 1 the value of q.

N.B q is the vertical distance between the half metre rule and the metre rule.

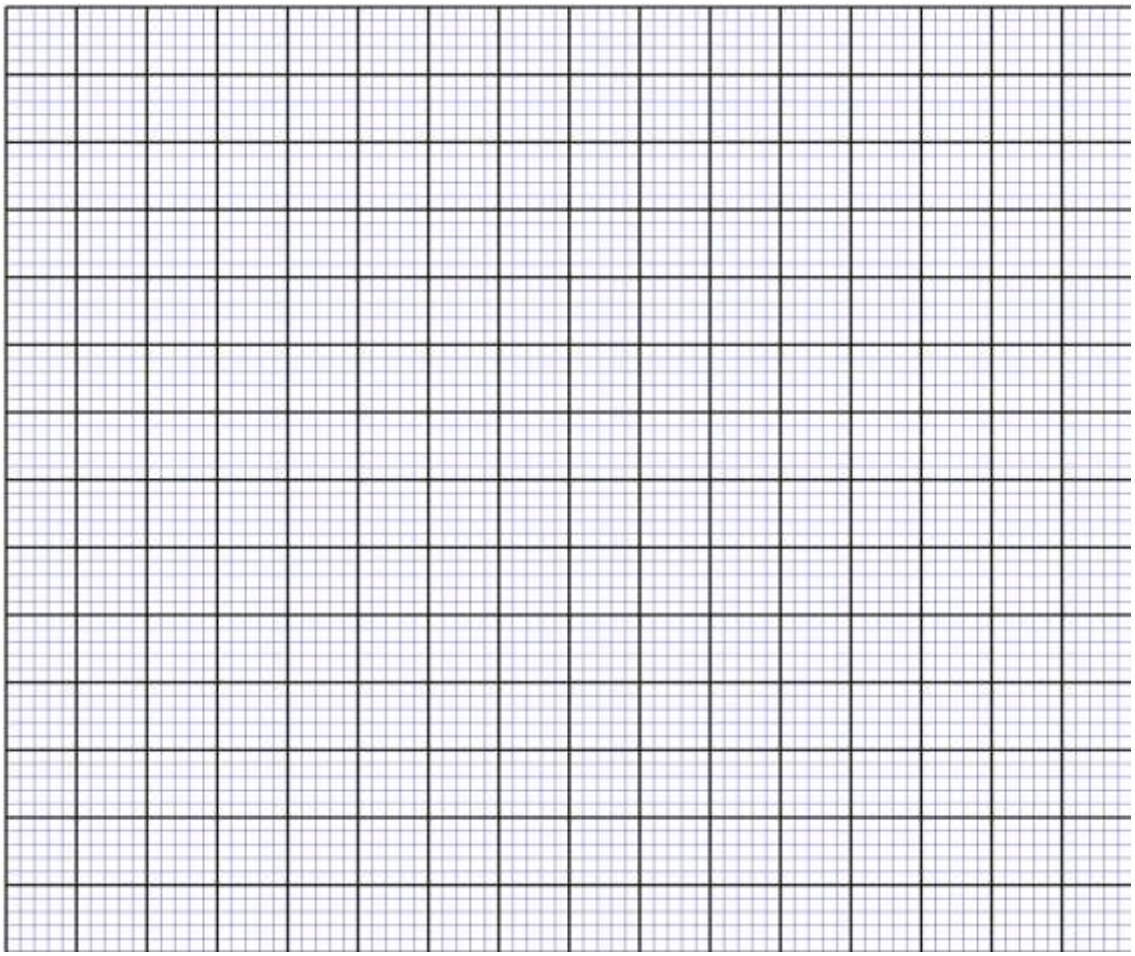
(d) Slightly displace one end of the half metre rule towards you and the other end away from you in a horizontal plane such that when released, it oscillates in the same plane. Measure time t for 10 oscillations. Repeat the procedures (c) and (d) for other values of p .

(e) Complete the table.
(8marks)

p(cm)	21.0	19.0	17.0	15.0	13.0	10.0	8.0
q(cm)							
Time t for 10 oscillations (s)							
Periodic time T (s)							
$\frac{p}{q}$							

(g) (i) Plot a graph of T (y axis) against $\frac{p}{q}$

(4marks)



(ii) Determine the slope S of the graph when $\frac{p}{q} = 2.0$

(2marks)

……

……

……

……

(iii) Determine the constant k given that $k = \frac{s}{\pi}\sqrt{D\text{g}}$ where g = 10m/s^2

(2marks)

……

……

……

End

MOCK 1

232 / 3
PHYSICS
CONFIDENTIAL

Each student will require the following :-

1. 2 new dry cells (size D)
2. A cell holder
3. A switch
4. An ammeter (0-2.5A)
5. A voltmeter (0 – 5v)
6. 6 connecting wires
7. 2 crocodile clips
8. A nichrome wire 1.0m long mounted on a scale (SWG 32) labeled X
9. A candle
10. A lens (f = 20 cm) and a lens holder
11. A screen
12. A metre rule
13. Rubber bung (hard).
14. Vernier calipers (shared).
15. Electronic beam balance (shared).

    (which records to 1 d.p.)
16. a retort stand, one boss, one clamp
17. One 500ml beaker ¾ full of water
18. One 100g mass
19. One 50g mass
20. 3 pieces of thread approximately 30cm long

MOCK 1

NAME:……. INDEX NO:…….. ……

SCHOOL…… SIGNATURE:…….....

231/3
PHYSICS
PAPER 3 (PRACTICAL)
TIME: 2 1/2HOURS

KCSE MOCK 1

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of the examination in the spaces provided above.
(c) This paper consists of questions: 1 and 2.
(d) Answer all the questions 1 and 2 in the spaces provided.
(e) All working must be clearly shown.
(f) Mathematical tables and electronic calculators may be used.

Take g = 10N/kg

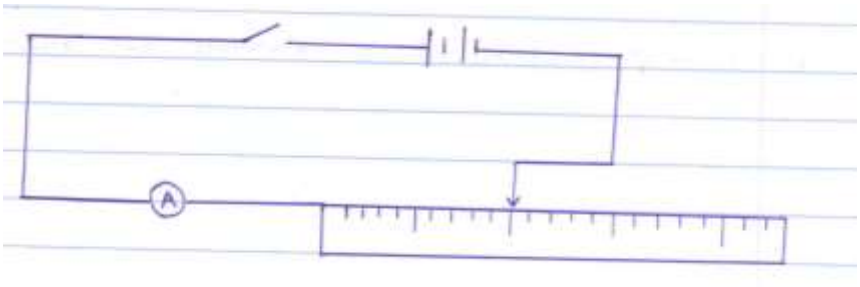
FOR EXAMINER'S USE ONLY

QUESTION	PART	MAXIMUM SCORE	CANDIDATE'S SCORE
1		20	
2	A	5	
	B	9	
	C	6	
TOTAL SCORE		40	

Question 1:
Each student will require the following

- 2 new dry cells (size D)
- A cell holder
- A switch
- An ammeter (0-2.5A)
- A voltmeter (0 – 5v)
- 6 connecting wires
- 2 crocodile clips
- A nichrome wire 1.0m long mounted on a scale (SWG 32) labeled X
- A micrometer screw gauge (can be shared)

Proceed as follows
a) Connect the circuit as shown in the figure below



b) Measure the voltage, E (across the cells) before closing the switch
E= …….. 1mk)

c) Adjust the length L of the wire 0.2, close the switch S and read the value of current and record the table below

Length L(m)	0.2	0.3	0.4	0.5	0.6	0.7
Current I (A)						
$\frac{1}{I}$ (A^{-1})						

d) Repeat the procedure in (c) above for the value of lengths given 6mks)

e) Calculate the values of $\frac{1}{I}$ and record in table above

f) On the grid provided, plot a graph of $\frac{1}{I}$ (y axis) against L 5mks)

g) Determine the gradient of the graph 3mks)

h) i) Measure the diameter of the wire in three points used
d_1 = d_2= d_3 =

Average d= 1mk)

ii) Determine the cross section area of the wire 2mks)

i) From the equation
$\frac{1}{I} = \frac{kL}{AE} + \frac{Q}{E}$ determine,

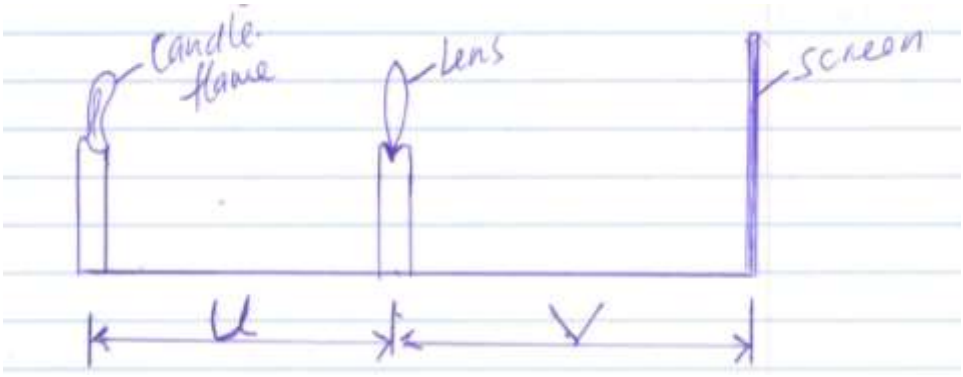
i) The value of k 2mks)

ii) The value of Q 1mk)

Question 2.
PART A
You are provided with the following

- A candle
- A lens and a lens holder
- A screen
- A metre rule

a) Set up the apparatus as shown in figure below (ensure that the candle flame and the lens are approximately the same height above the bench)



b) Set the position of the lens so that the 40cm from the candle (U=40). Adjust the position of the screen until a sharp image of the candle flame is obtained. Measure the distance, V between the lens and the screen. Record the value of V_1 V = …… cm) 1mk)

c) Repeat the procedures in b) above for other values of U in the table b below.
Table b)

U(cm)	45	50	55
V(cm)			
Magnification (m) $\frac{v}{u}$			

d) Given that f = $\frac{v}{m+1,}$ where f is the focal length of the lens, use the results in table above to determine the average values of f. 4mks)

PART B.

You are provided with the following:

- rubber bung.
- vernier calipers.
- beam balance.

Proceed as follows:

a) Using a vernier caliper, measure the lengths D, d, and h as shown in **figure 2.**

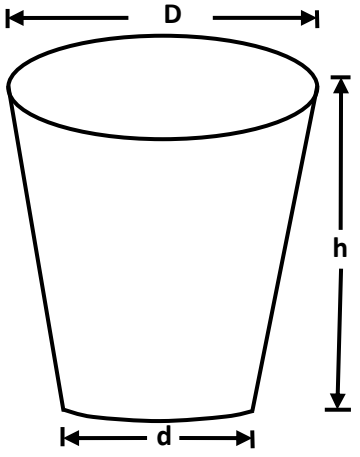


Figure 2

D = ... m (1 mark)

d = ... m (1 mark)

h = ... m (1 mark)

b) (i) Measure the mass, M of the rubber bung using the beam balance.

M = ... kg (1 mark)

(ii) Given that Q = $\left(\frac{d + D}{4}\right)$, determine the value of Q. (1 mark)

(iii) Determine the value of r given that $\pi r Q^2 = \frac{M}{h}$ (3mark)

(iv) What are the units of r (1 mrk)

(v) What is the significance of r (1 mrk)

PART: C

You are provided with the following

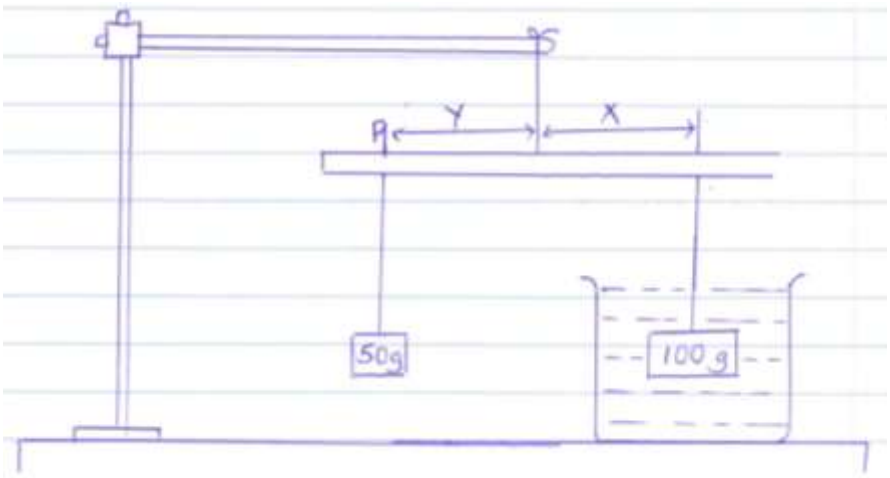
- a metre rule
- a retort stand, one boss, one clamp
- One 500ml beaker ¾ full of water
- One 100g mass
- One 50g mass
- 3 pieces of thread approximately 30cm long

Procedure

a) Balance the metre rule horizontally by suspending it from the stand and clamp with one of the threads. Record the balance point G

G = _____ cm 1mk)

b) suspend the 100g mass from the metre rule at a point such that x =5cm from point G, with the 100g mass completely immersed in water in the beaker hang the 50g mass from the metre rule.
Note the point of suspension (p) of the mass
P=_____1mk)



c) Calculate the apparent weight of the 100 g mass in water. 3mk)

d) Find the upthrust of 100g mass in water. 2mk)

POST MOCK 1

CONFIDENTIAL

The following apparatus should be provided for the Physics practical paper;

Question one

You are provided with the following:

- 2 new dry cells size D
- A cell holder
- A switch
- A millimeter of range 0 to 1 mA
- A capacitor labeled C (2200μF)
- 8 connecting wires; at least four with crocodile clips on one end
- A stopwatch
- A carbon resistor labeled **R (4.7KΩ)**

Question Two

You are provided with the following;

- a rectangular glass block of dimensions; 9.6cm X 6.0cm X 2.4cm (Tolerance + or – 0.2cm)
- 4 optical pins
- 2 thumb pins
- a soft board
- a plain paper

POST MOCK 1

Name: _____Index No. _____ /_____Adm No._____

Candidate's Signature _____

Date: _____

232/3

PHYSICS PAPER 3

(PRACTICAL)

TIME: 2 ½ hours

KCSE POST MOCK 1

Kenya Certificate of Secondary Education

PHYSICS (PRACTICAL) Paper 3

TIME: 2 ½ HOURS

Instructions

- *Write your name, index number and admission number in the spaces provided above.*
- *Sign and write the date of examination in the spaces provided above.*
- *Answer ALL questions in the spaces provided in the question paper.*
- *You are supposed to spend the first 15 minutes of the 2 ½ hrs allowed for this paper reading the whole paper carefully before commencing your work.*
- *Marks are given for a clear record of the observations actually made, their suitability, accuracy and the use made of them.*
- *Candidates are advised to record their observations as soon as they are made.*
- *Non-programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.*
- *This paper consists of 8 printed pages.*
- *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*

For Examiner's Use Only

Question 1	c	d	g	h	i	(j)	(k)		**TOTAL**	
Maximum Score	1	1	8	5	2	2	1		**20**	
Candidate's Score										
Question 2		c	e	f	g	h	i	j	k	**TOTAL**

Maximum Score		1	6			5	3	3	2	**20**
Candidate's Score										**40**

GRAND TOTAL

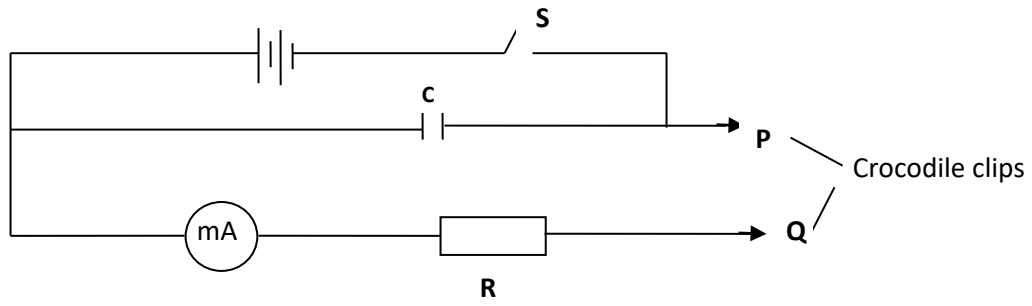
Question one

You are provided with the following:

- 2 new dry cells size D
- A cell holder
- A switch
- A milliammeter of range 0 to 1 mA
- A capacitor labeled C
- 8 connecting wires; at least four with crocodile clips on one end
- A stopwatch
- A carbon resistor labeled **R**

Proceed as follows

a. Connect the circuit as shown in the **figure 1**below, where **P** and **Q** are crocodile clips.



b. Close the switch **S**

c. Name the process which takes place when the switch **S** is closed

……. (1 mark)

d. Connect the crocodile clips P and Q. Observe and record the highest reading of the milliammeter $\mathbf{I_o}$ **(** This is the current at $t_0 = 0$)

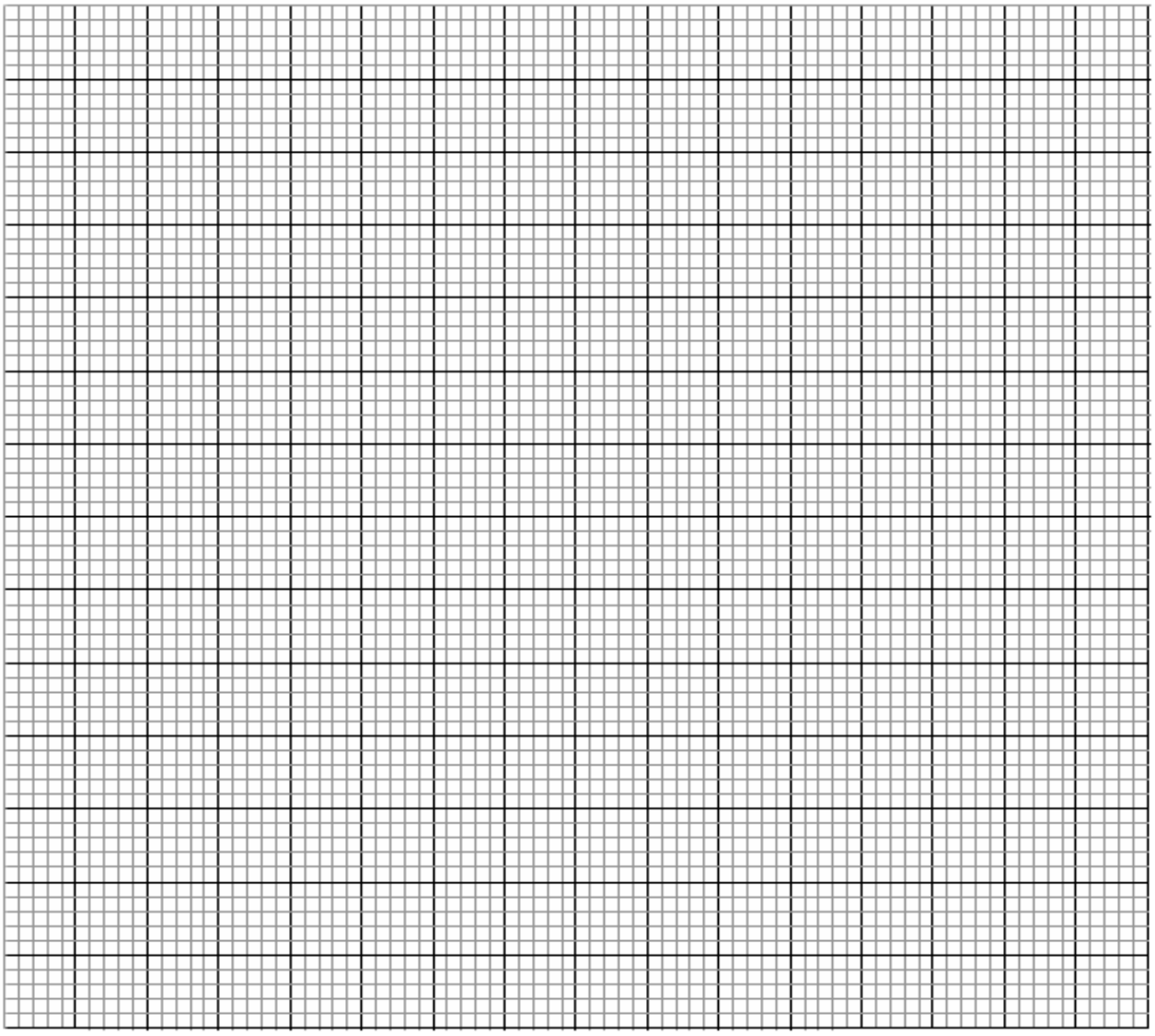
$\mathbf{I_o}$ = ……. mA (1 mark)

e. While the milliammeter show the maximum value of current I_o, open the switch S and start the stop watch simultaneously. Stop the stop watch when the current has dropped from I_o to 0.5 mA. Read and record in the table below the time taken

f. Reset the stop watch and close the switch. Repeat the procedure in (e) to measure and record the time taken for the current to drop from $\mathbf{I_o}$ to each of the other values shown in the table below. (5 marks)

Current **I** (mA)	**0.5**	**0.4**	**0.3**	**0.2**	**0.1**
Time **t** (s)					

g. Plot a graph of Current **I** (y – axis)(mA) against time **t** (s) (5 marks)



h. From your graph, find **W** the value of **I** when **t = 10s**. (3 marks)

i. Given that **A = 10W**, determine the value of **A.** (3 marks)

j. Determine the voltage across **R** at **t = 10s** given that R = 4.7k**Ω** (2 marks)

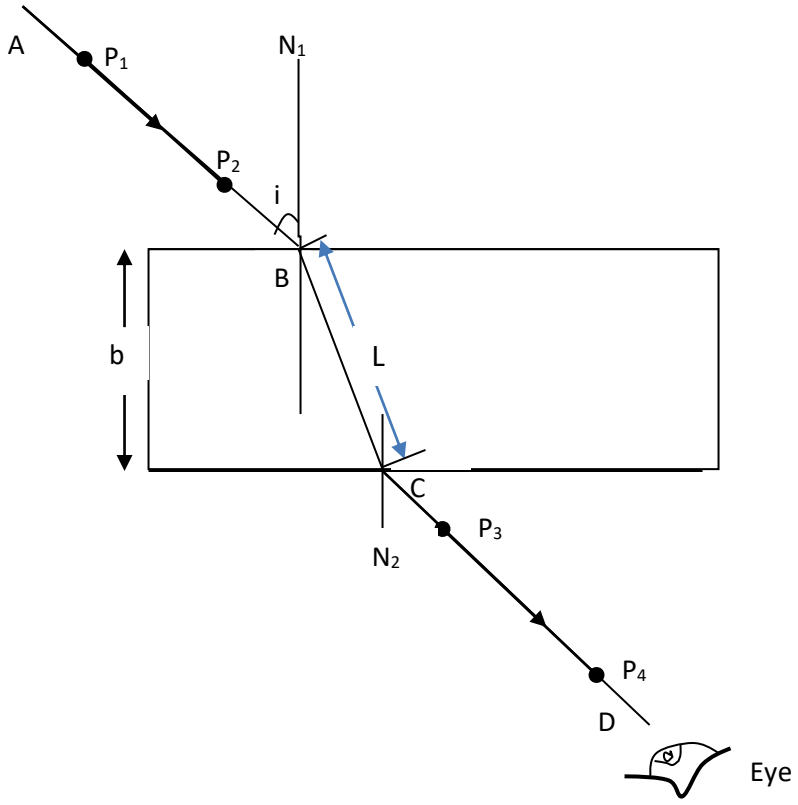
Question Two

You are provided with the following;

- a rectangular glass block
- 4 optical pins
- 2 thumb 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 below.



(b) Remove the glass block and construct a normal at B. Construct an incident ray AB of angle of incidence, i = 20^0.

(c) Measure the breadth **b** of the glass block

breadth **b** =…… (1 mark)

(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.

(e) Measure the length L and record it in the table below

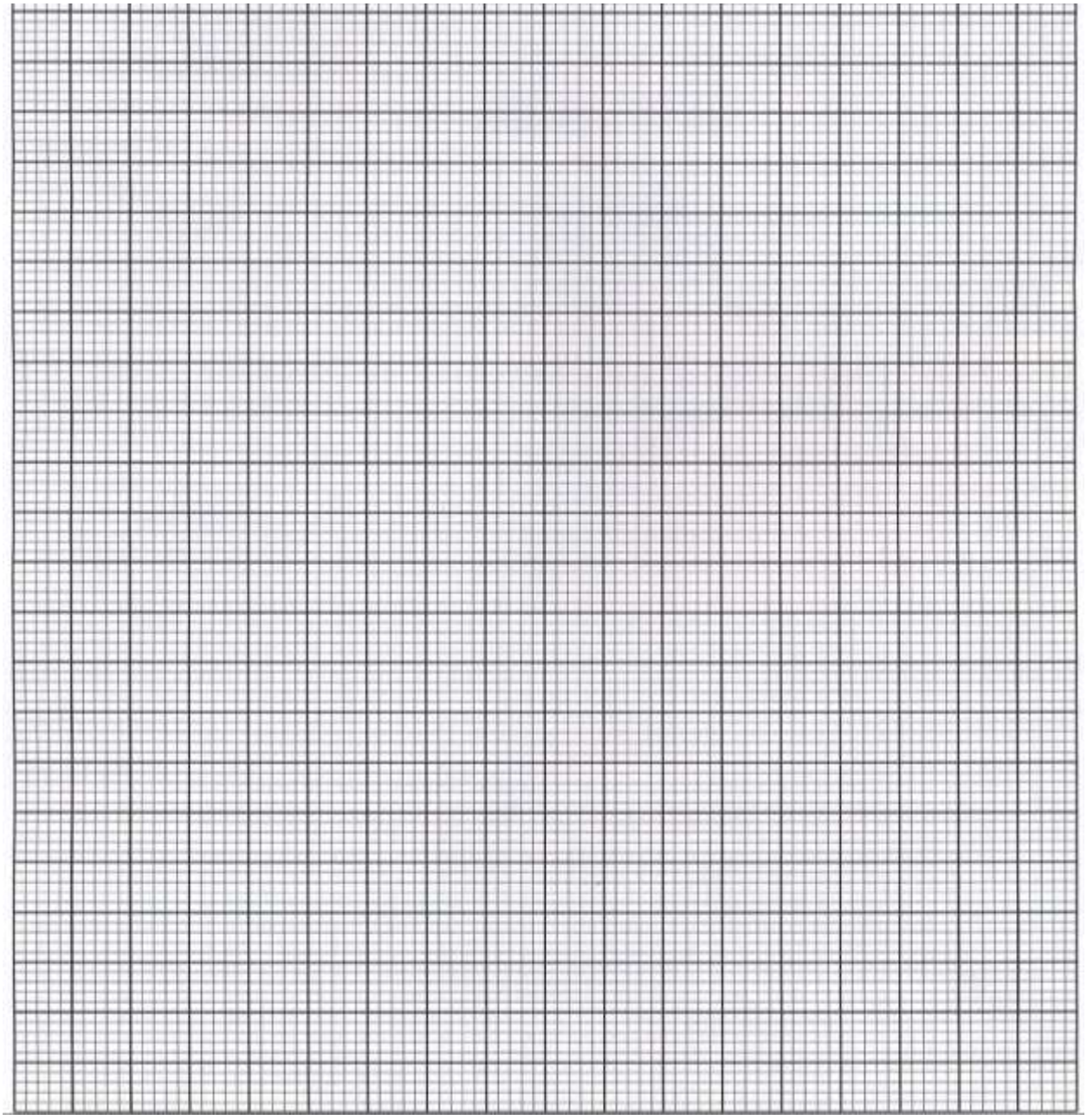
Angle i^0	L (cm)	L^2 (cm) ^{2}	$\frac{1}{L^2}$ (cm-^{2})	$Sin^2 i$
20				0.1170
30				0.25
40				0.4312
50				0.5868
60				0.75
70				0.8830

(6 marks)

(f) Repeat the procedure above for the angles of incidence given.

(g) Calculate the values of $\frac{1}{L^2}$ and record in the table above.

(h) Plot a graph of $\frac{1}{L^2}$ (y-axis) against Sin^2i. **(5 marks)**



(i) Calculate the gradient **S** of the graph **(3 marks)**

Given that the equation of that graph is; $\frac{1}{L^2} = -\left(\frac{1}{n^2 b^2}\right) \text{Sin}^2 i + \frac{1}{b^2}$

(j) Determine the value of ***n*** (3 marks)

(k) Present your work sheet; attached to the exam paper (2 mark)