NAME…… **ADM NO ……**

SCHOOL……CLASS……SIGN.....……

DATE…….

231/3
PHYSICS
PAPER 3
(PRACTICAL)
TIME: 2½ hours

KCSE 2022 TOP PREDICTION MASTER CYCLE 7

Kenya Certificate of Secondary Education (K.C.S.E)
232/3
PHYSICS
PAPER 3
PRACTICAL
TIME: 2½ Hours

Instruction to The Candidates

(a) Write your name and index number in the space provided above.
(b) Answer all questions in the space provided in the question paper
(c) You are supposed to spend the first 15 minutes of the 2½ hours allowed for this paper reading the whole paper carefully before commencing your work.
(d) Marks are given for clear record of the observation made, their suitability accuracy are use.
(e) Candidates are advised to record their observation as soon as they are made.
(f) Non-programmable silent calculators and mathematical tables may be used.

For Examiners Use Only

QUESTION 1 A

Part	i	iii	iv	v	vi	vii	viii	Total
Students Score								

QUESTION 1B

Part	e	f	g	Total
Students score				

QUESTION 1 C

Part	b	c	d	e	Total
Students score					

QUESTION 2

Part	i	iii	iv	v	Total
Students score					

GRAND TOTAL

Question 1

A) You are provided with the following apparatus:

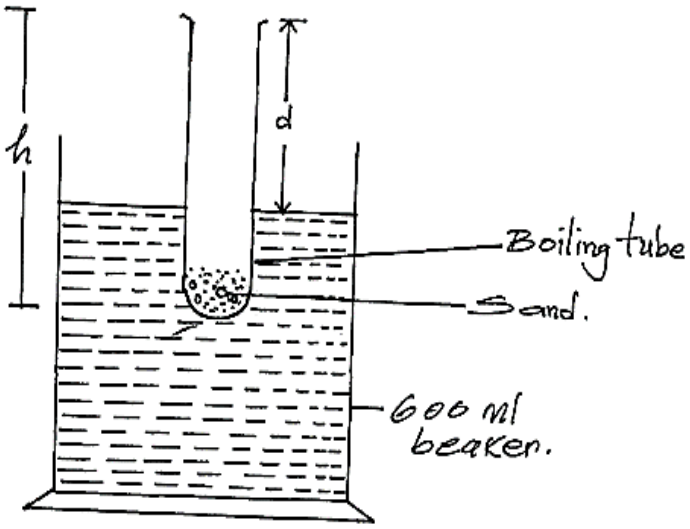
- A boiling tube,
- Some dry sand
- A liquid in a beaker labeled L
- Half meter rule
- Vernier caliper (To be shared)
- A weighing balance (To be shared)
- Tissue paper

Proceed as follows:

i) Measure the length of the boiling tube using the vernier calipers.

h=……cm (1mrk)

ii) Put a little amount of sand in the boiling tube and place it in the beaker which is almost filled with liquid L. Add sand little by little until the tube floats upright as shown in the figure bellow.



iii) Measure the length d, part of the boiling tube which is above the liquid.

d=……cm (1mrk)

iv) Determine the length t, of the boiling tube which is immersed in the liquid.

t=……cm (1mrk)

v) Remove the boiling tube from the beaker, wipe it dry on the outside and measure its mass, including the sand inside.

m=……g (1mrk)

vi) Measure the external diameter, D, of the boiling tube.

D=……..cm (1mrk)

vii) Determine the external reading, R (1mrk)

R =…… + ……..cm

viii) Using the formula $m = 12\rho\pi R^2$, determine ρ of the liquid (3mks)

ρ =

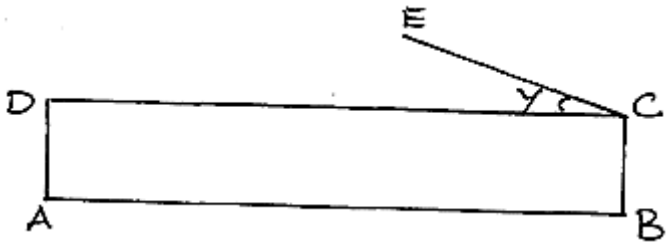
B) You are provided with the following apparatus:

- One plane mirror.
- One rectangular glass block.
- One white plane paper.
- Soft board.
- A protector (student geometrical set).
- A piece of plastic ine.
- Four optical pins.

Proceed as follows

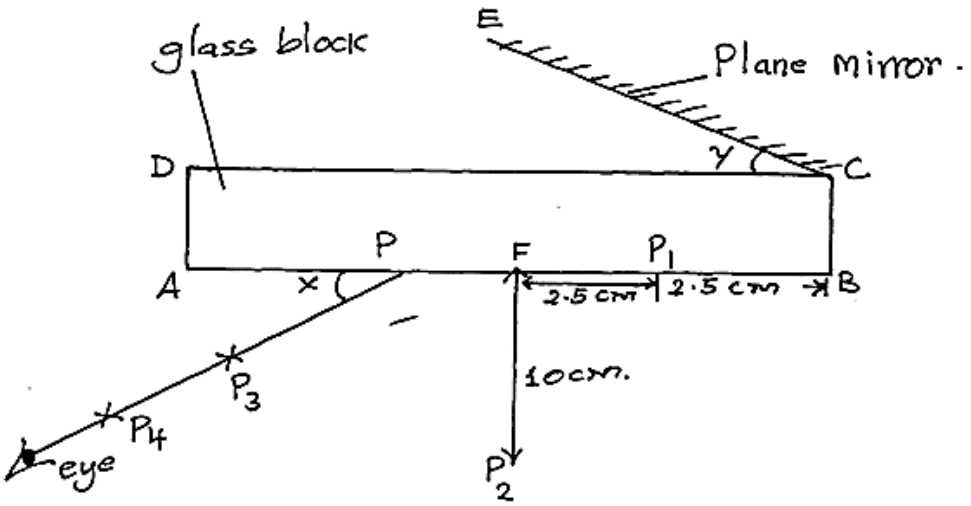
a) Place the glass block vertically on the white paper with its largest surface facing you. Draw the outline of the block and label it ABCD. Remove the block.

b) From point c measure angle y=30^o and draw line CE as shown in the diagram.



c) From point B, fix a pin P1 at 2.5cm from B along BA and another pin P2 2.5cm from P1 and 10cm from point F on line AB. As shown in the diagram.

d) Replace the glass block and put the plane mirror vertically on line CE behind the glass block (fix it with plastacine). Arrange pins P3 and P4 to be in a straight with the image of P1 and P2 as seen through the glass block after reflection from the plane mirror. Draw a line P3P4 to meet the block at P as in the figure below.



e) Measure angle X and state its units (1mk)

X =……..

f) Given the equation $Y = Y_0 - 0.515X$ determine the value of y_0. (2mks)

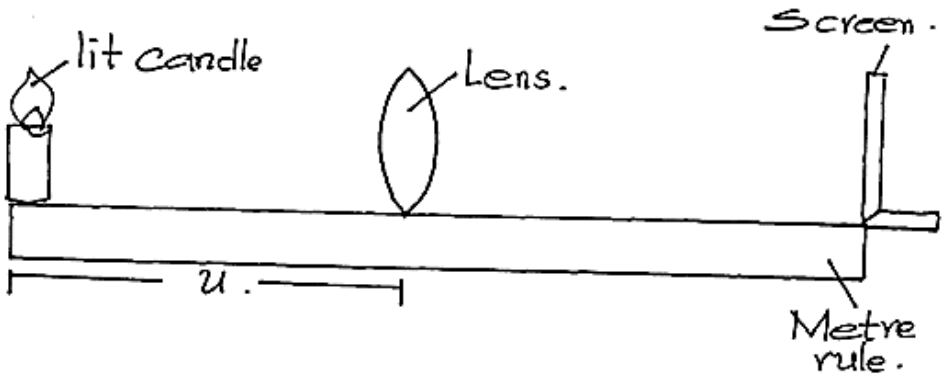
g) Find n from the formula $n = \frac{1}{\sin(90 - Y_o)}$ (2mks)

C) You are provided with;

- A candle,
- A biconvex lens,
- A lens holder,
- A meter rule,
- A white screen.

Proceed as follows;

a) Arrange the lit candle and the white screen on the bench at a distance of 100cm from each other. Mount the meter rule on the bench as shown so that it's zero mark coincides with point of the lit candle and 100cm mark coincide with the position of the screen.



b) Place the lens between the screen at a point near the candle. Move the lens systems together with its holder towards the screen until you observe a sharp magnified inverted image of the flame on the screen.

Record the distance U_1 between the lens and the lit candle.

U_1……cm (1mrk)

c) Move the lens system further towards the screen until you obtain another position where a sharp diminished inverted image of the flame is formed on the screen.

Record the new distance U_2 between the lens and the candle.

U_2=……..cm (1mrk)

d) Determine the displacement d of the lens (1mrk)

$d = U_2 - U_1$

d) Determine Constant Ø given that Ø$= \frac{1+m}{mU_1}$ when $m = \frac{100 - U_1}{U_1}$ (3mks)

Question 2

You are provided with the following apparatus;

- Ammeter (0-1 A)
- Voltmeter (0-5V)
- Two dry cells
- One resistance wire fixed on a meter rule/mm scale.
- A switch
- Six connecting wires with crocodile clip.

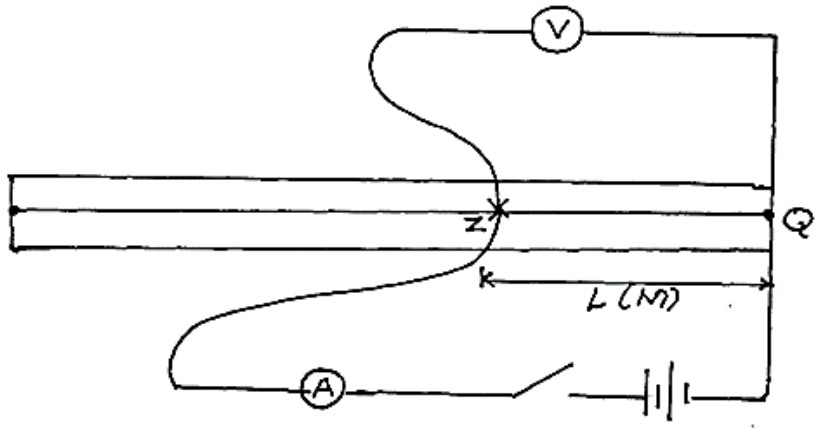
A cell holder

Proceed ad follows

i) Set up a circuit and measure the potential difference M across the cells before connecting the circuit.

M =……. (1mk)

ii) Arrange the circuit as shown below.



iii) Keeping both crocodile clips attached on the resistance wire QZ for a length L=0.1m from Q, record corresponding values of current I (A) and voltage (V) in the table below.

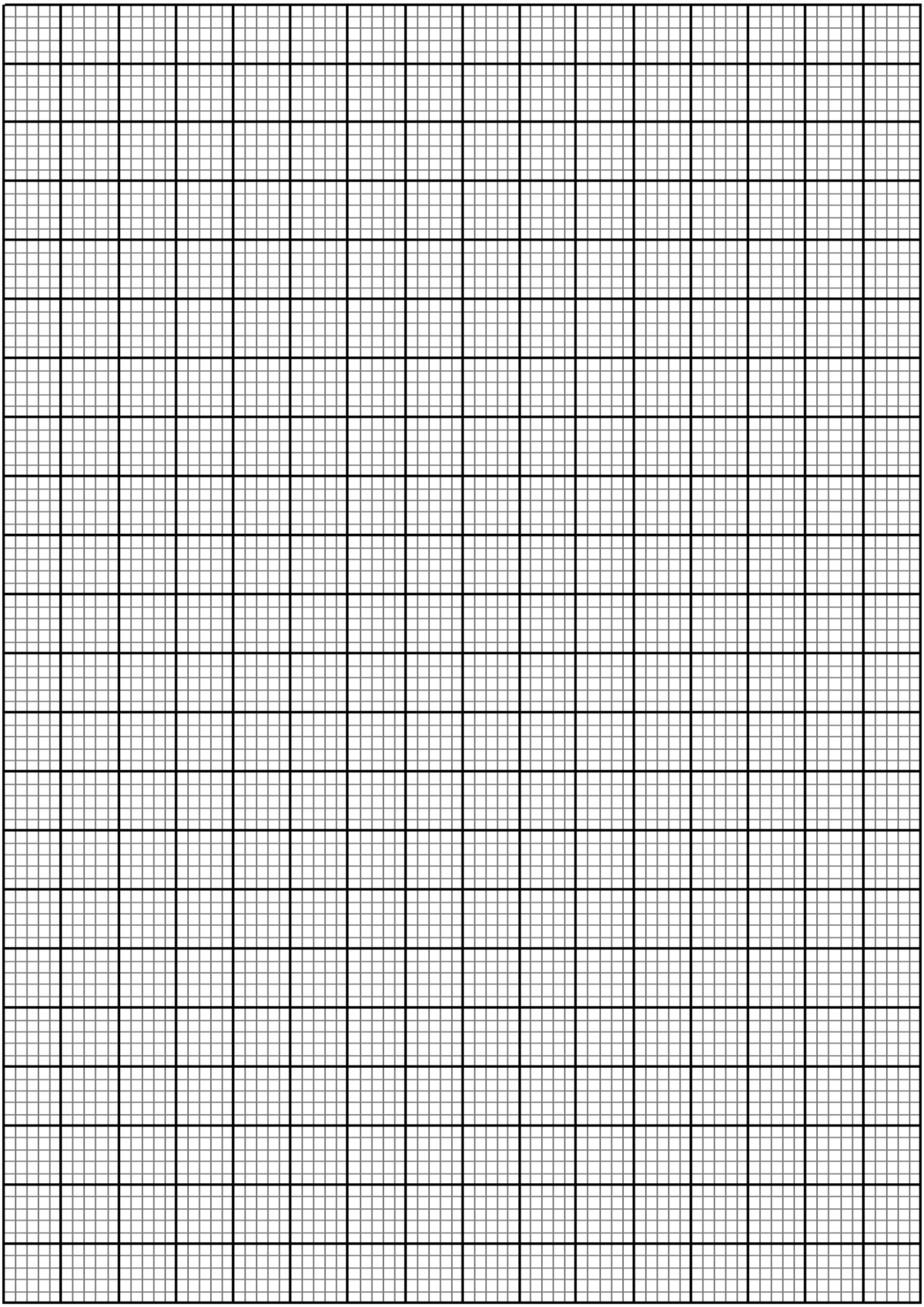
Repeat the procedure from the other length L of L 0.2m, 0.3m, 0.4m, 0.5m, 0.6m, 0.7m and 0.8m.

Length L(m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Current **I**(A)								
Voltage V (V)								
$P = \frac{V}{I}(\Omega)$								

$\frac{1}{\mathbf{I}}(A^{-})$								

NB (give your answer in 3 significance figures.)

iv) Draw a graph of $\frac{1}{\mathbf{I}}$ against P (5mks)



v) Given that the Quantities are connected by the equation $\frac{1}{\mathbf{I}} = \frac{P}{m} + \frac{x}{m}$

Determine the value of

a) m (4mks)

b) x (2mks)

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