NAME: .....ADM NO: .....CLASS: .....

CANDIDATE SIGNATURE: .....DATE: .....

232/1
PHYSICS
FORM 4 PAPER 3
MARCH 2019
2 ½ HOURS
END TERM 1

KENYA CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

INSTRUCTIONS TO CANDIDATES

a) Write your name, admission number and class in the spaces provided above.
b) Sign and write the date of examination in the spaces provided above.
c) This paper consists of two sections A and B.
d) Answer all questions in section A and B in the spaces provided.
e) All working must be clearly shown in the spaces provided.
f) Non-programmable silent electronic calculators may be used.

FOR EXAMINERS USE ONLY

	Question	Maximum Score	Candidate Score
	1	20	
	2	20	
TOTAL		40	

This paper consists of 6 printed pages, candidate should check the question paper to ascertain that all pages are printed as indicated and no questions are missing.

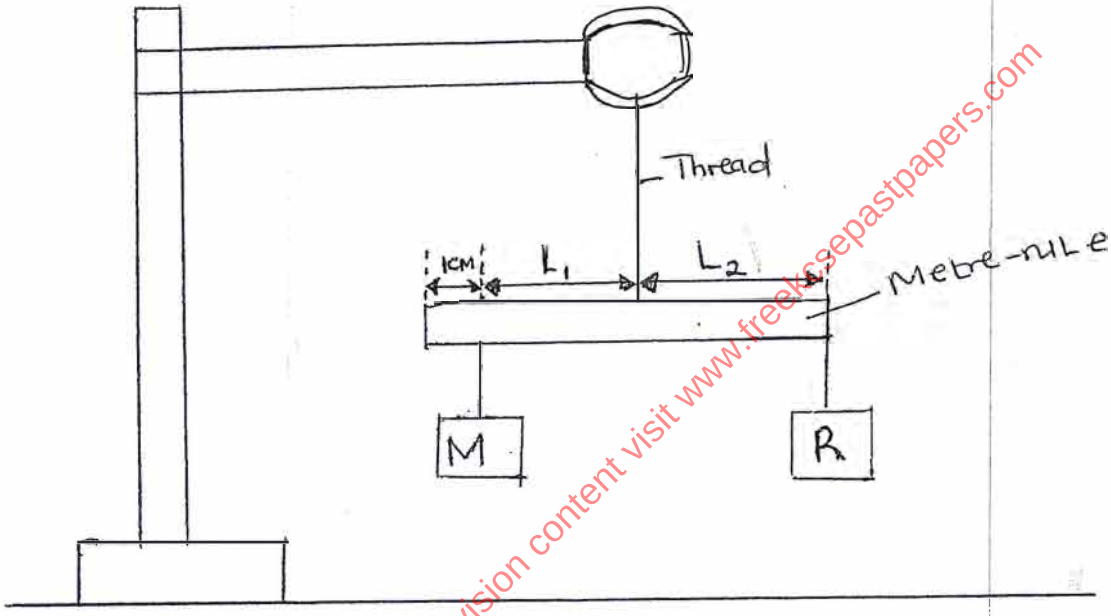
Question one: Part A

You are provided with the following

- A metre rue
- Three 20cm long thread
- A cello tape
- Complete report stand with cramp and boss
- Weighing balance
- Six 10g masses

-Mass R

a) Arrange the apparatus as shown below



Adjust the metre rule until it balances horizontally when there is no mass hanged on it. Record the position of the centre of gravity C.o.g_____ cm (1mk)

(b) Measure the mass of the metre rule

Mass of metre rule (p) _____ kg (1mk)

(c) Fix mass R at the end of the metre rule using a cell tape. This mass should remain fixed throughout the experiment.

(d) Hang 10g mass on the metre rule by use of thread at 1cm mark. Adjust thread T until the metre rule balances again at a new mark. Record the length L_1 and corresponding length L_2 in the table below.

(e) Repeat the procedure in (d) for after masses as in the table below (6mks)

Mass m(g)	10	20	30	40	50	60
L_1 cm						
L_2 cm						
$Y=(C-L_1)P$ (kgcm)						
$X = (L_2 - L_1)$ cm						

(f) Plot a graph of Y against X (5mks)

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(g) Calculate the slope S of the graph (3mks)

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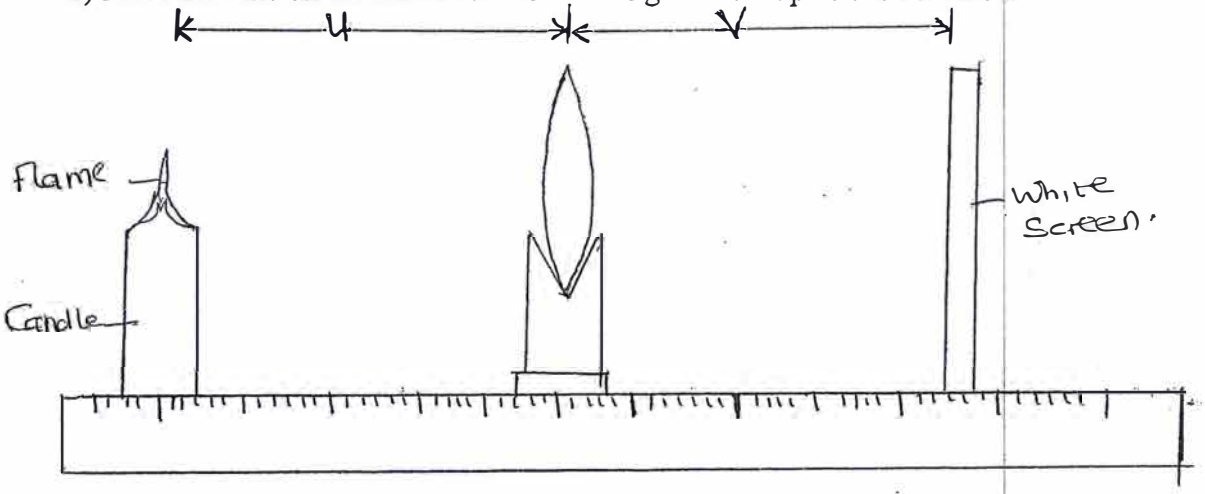
PART B

2. You are provided with the following

- A candle
- Metre rule
- White screen
- Lens holder
- Convex lens
- Meter box (to be shared)

a) Place the lens on the metre rule and arrange the set up as shown below.



(b) Adjust the position of the lens so that if it is a distance u=30cm from the candle. Adjust the position of the screen until a well focused image of the flame is formed on the screen. Measure and record in the table below the image distance V between the screen and lens.

(c) Repeat part (b) for other values of (u) shown in the table and complete the table (3mks)

U(cm)	30	35	40
V(CM)			
$X=\frac{v}{u}$			
$Y=\frac{v}{x+1}$			

(d) Determine the mean value of Y (1mk)

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QUESTION TWO

PART A

You are provided with the following apparatus

- A voltmeter (0.2.5 v or 0-5v)
- A resistance wire labeled P Q mounted on a mm scale
- One dry cell (size D)
- An ammeter (0-1A)
- 8 connecting wires at least 4 with crocodile clips
- A switch
- A jokey
- Micrometer screw gauge

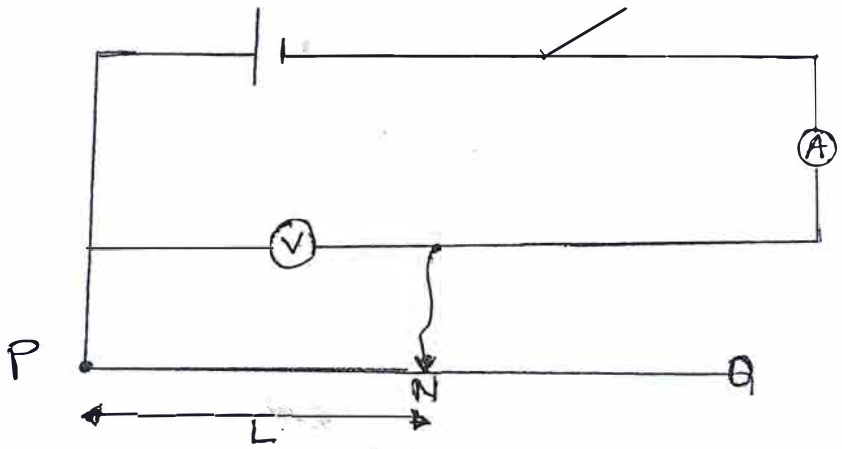
Proceed as follows

(a) Using micrometer screw gange, measure the diameter D of the wire PQ

D ---------- mm (1/2mk)

D ---------- M (1/2 mk)

(b) Set up the apparatus as shown below



(i) With L set at 10cm, record the value of V and I

V= ..... (1mk)

I..... (1mk)

(ii) Determine resistance R for that section of the wire (PN) (2mks)

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(ii) Determine A given that $A = \frac{\pi D^2}{4}$ (2mks

(iv) Given that $R = \frac{\rho L}{4}$ determine the value of ρ the resistivity of the wire (3mks)

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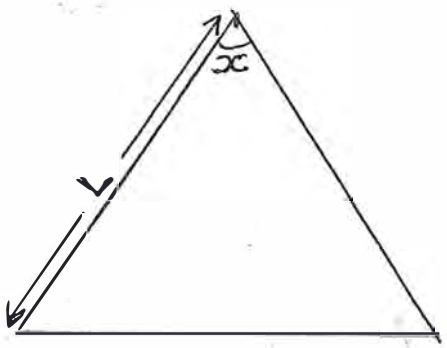
QUESTION TWO
PART B

You are provided with the following

A triangular glass
A white sheet of paper
Four optical pins
Soft board
Four thump pins

Proceed as follows

(a) Fix the plain sheet of paper on the soft board using thumb pins. Place the triangle prism on the paper. Remove the prism and use a ruler to extend the three sides of the outline



Measure angle X and the length L

X 1mk

L ..... CM 1mk

b) At a point about a third way along one side of the outline from angle X, draw a normal (2mks)

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c) Draw a line at angle I = 40^0 to normal. Stick two pins P_1 and P_2 vertically on it is line as shown in the figure below.

d) remove the prism and the pins. Draw a line joining the marks made by P_3 and P_4. Extend the Lines P_1 P_2 and P_3 P_4 to interest. Hence measure the angle of deviation D

D ..... (1mk)

e) For two more values of angle I shown in the table locate and measure the corresponding angles of deviation. Complete the table below

I	40^0	50^0	60^0
D			

(f) (i) Determine the average value DM of D. (1mk)

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(ii) Determine the constant K using equation (2mks)

$$K = \frac{\sin \frac{(X + Dm)}{2}}{\sin \frac{X}{2}}$$

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