LAIKIPIA EAST TERM 2 2022 FORM 4 EVALUATION EXAM

Kenya Certificate of Secondary Education – K.C.S.E

232/3
PHYSICS
Paper 3
Time: 2 ½ HOURS
AUGUST 2022

NAME……CLASS……..ADM……

SCHOOL……..DATE……..SIGN……..

INSTRUCTIONS TO THE CANDIDATE

-Take the first 15 minutes to confirm that all the required apparatus is available and functioning.
- This paper has two compulsory questions.
-Answer all the questions in the spaces provided.
- All working should be clearly shown.
- Electronic unprogramable calculators can be used where necessary.

For examiner's use only

QUESTION ONE

Question	b(i)	c(i)	ii	iii	iv	d(i)	(ii)
Score	1	5	2	1	1	2	2
Candidates score							

subtotal _____

QUESTION TWO

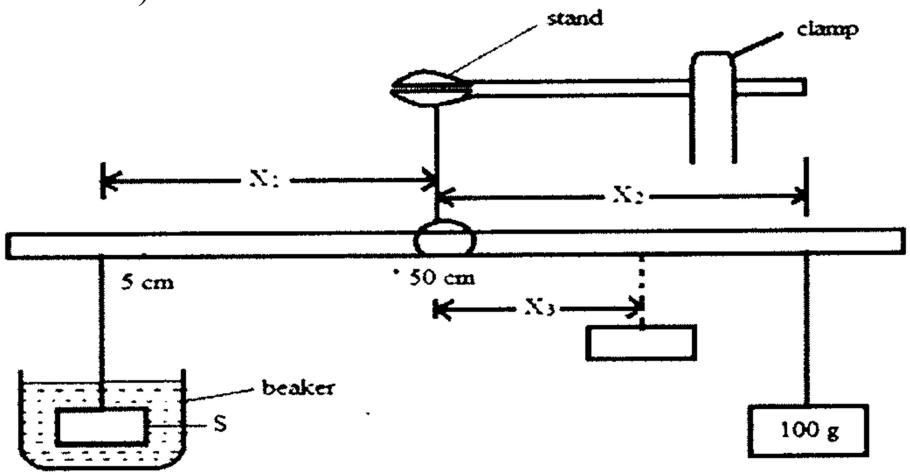
Question	e	f	g(i)	(ii)	(iii)	j(i)	ii
Score	1	6	5	2	2	2	2
Candidate's score							

GRAND TOTAL

QUESTION 0NE

1. You are provided with:
   - Mass S
   - One l00g mass
   - Metre rule
   - Cotton thread (3 – pieces each about 30cm long)
   - Retort stand and clamp
   - 250cm^3 glass beaker
   - 200cm^3 of water

a) i) Make loops of thread on mass S and the 100g mass
   ii) Suspend the metre rule on the clamp from the 50cm mark
   iii) Hang mass S from the mark. Balance the metre rule using the l00g mass (see fig. 1 below)



iv) Measure the distance X_1 and X_2 from the 50cm mark

v) Repeat the procedures for the values of X_1 indicated in the table below:

X_1(cm)	X_2(cm)	X_3(cm)	$X_2 - X_3$ (cm)
45			
40			
35			
30			
25			
20			

b) i) Repeat steps (a) (iii) to (a) (iv) above, but this time, keep mass S totally immersed in water.
Record distance X_3(new position of the 100g mass after emmersing in water) in the table above.
ii) Complete the table for the values of $(X_2 - X_3)$ (7 marks)

c) i) Plot a graph of X_2 (Vertical axis) against (X_2-X_3) on the grid provided. (5 marks)
ii) Determine the slope of your graph. (2 marks)

iii) What physical property does the slope, represent? (1 mark)

iv) Given that the density of water is 1000kg/m3, determine the density of mass, S. (1 mark)

d) i) Using the apparatus you were given, determine the mass of your metre rule. (2 marks)

ii) Draw a diagram of the set-up of the apparatus you have used to work out (d) (i) above. (2 marks)

QUESTION TWO

2. Part A

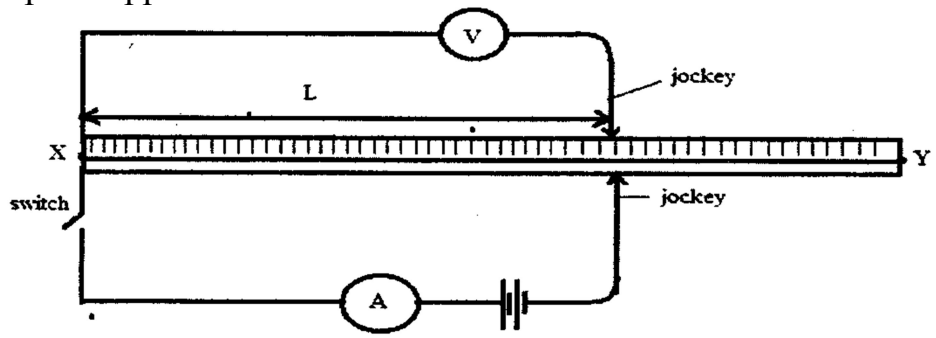
You are provided with the following: -

- Ammeter
- A voltmeter
- A straight wire XY mounted on a millimeter scale
- Two jockeys
- 7 connecting wires
- A micrometer screw gauge (to be shared)
- A cell holder for two dry cells
- Two dry cells
- A switch

Proceed as follows:

e) Using the micrometer screw gauge, determine the diameter 'd' of the wire XY
d = _____ mm (1 mark)

Set-up the apparatus as shown below:-



f) With both jockeys set at L = 10cm from X, measure current I through the wire and voltage V across it. Repeat this procedure for the other values of L and record in the table below: (6 marks)

Length (cm)	10	30	40	50	70
Length (m)					
Current I (A)					
Voltage V(V)					
$R = \frac{V}{I}\Omega$					

g) i) Using the values in the table above, plot a graph of I1(A) against R(Ω) on the grid provided. (5 marks)

ii) Determine the gradient of the graph at R = 10Ω (2 marks)

iii) Given that $-I = \frac{\pi d^2 R}{4KL}$ where L = 60 cm, find the value of K (2 marks)

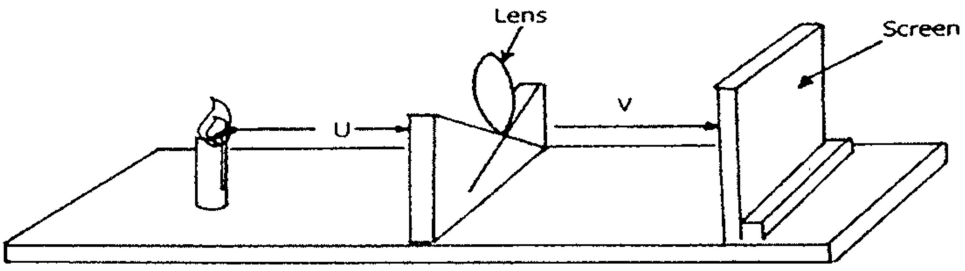
Part B

You are provided with the following apparatus

- A lens
- A lens holder
- A candle
- A white screen
- A metre rule

Procedure

h) Set up the apparatus a shown in the figure 3 below:



i) Starting with u = 30cm adjust the position of the screen to obtain a sharp image of the candle.

Record value of V in the table shown below:

j) i) Repeat the procedure above for u = 20cm and complete table below:

Table 3

u cm	v cm	$M = \frac{v}{u}$
20		
30		

(2 marks)

ii) Given that the focal length of the lens satisfies the equation,

$f = \frac{v}{1 + m}$ determine the average value of the focal length. (2marks)