Name:…………………………………………..……………………………Index No………………………

232/3
PHYSICS PRACTICAL
PAPER 3
JULY/AUGUST 2014
TIME:2 ½ HOURS

Candidate's Signature:…………………….……………

Date:……………………………….………

NYAMIRA SUB-COUNTY JOINT EVALUATION EXAM

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

232/3
Physics
Paper 3
2 ½ hours

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 spaces provided above.
(c) Answer ALL the questions in the spaces provided in the question paper.
(d) 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.
(e) Marks are given for a 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) Non-programmable silent electronic calculators may be used.
(h) This paper consists of 8 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

	c	d(i)	(ii)	(iii)	(iv)	f	g	
Maximum Score	7	4	2	2	2	1	2	20
Candidate's Score								

Total

Question 2

	b	e	f	g	h	i	k	k	m	
Maximum Score	1	6	4	2	2	2	1	3	2	20
Candidate's Score										

Total

GRAND TOTAL

This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as ir hat are missing.

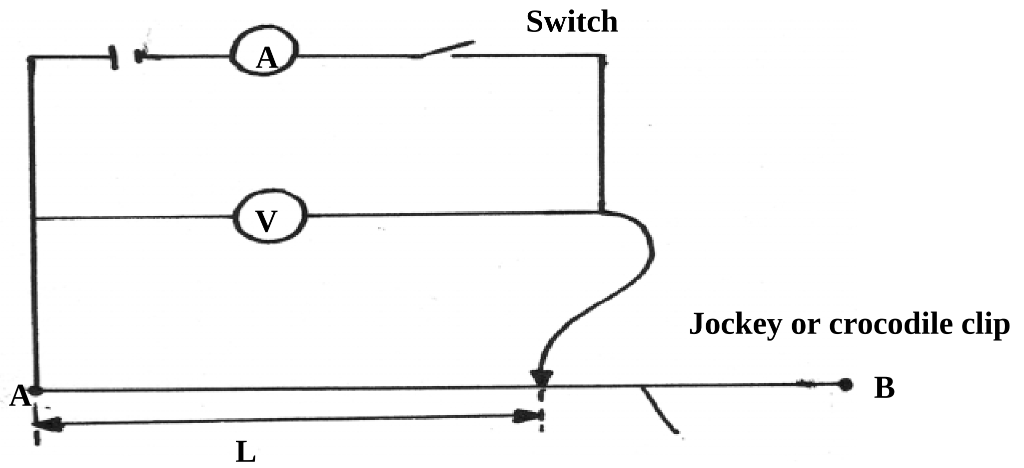
QUESTION 1 PART A

1. You are provided with the following
   - A micrometer screw gauge (to be shared)
   - A voltmeter (0-3v or 0-5v)
   - Ammeter (0-1A)
   - A switch
   - A jockey/long wire with crocodile clip attached
   - One new dry cell
   - 8 connecting wires with crocodile clips attached to one end

   Proceed as follows

(a) Set up the circuit below, Fig 1 ensure that when the switch is open, both meters read zero, keep the switch open when readings are not being taken

Fig 1



(i) Measure and record the diameter d of the nichrome wire AB using the micrometer screw gauge
d= m (½ mk)

(ii) Disconnect the jockey from wire AB and close the switch. Record the value E of the voltmeter reading.
E=____________________________________V (½ mks)

(b) Now, connect the jockey on AB at a distance L=2.5cm. Close the switch and record the voltmeter and ammeter readings, V and I respectively in table 1 below.

Table 1

L(cm)	2.5	7.5	10.0	20.0	30.0	40.0
D.d(v)						
Current I(A)						
IV(watts)						

(i)Complete the table (5mks)
(ii) Plot a graph of IV (vertical axis) against L (5mks)

(iii) Using your graph, find the value lo where your graph (the horizontal axis)

Lo=________________________cm (1mk)

(c)(i) Now, place the jockey on AB such that long the L is equal to the value of l=63cm. close the switch and record both the voltmeter reading, V and the ammeter reading, I

V=__________________________V (½ mk)

I=__________________________A (½ mk)

(ii) Work out the values v where (1mk)

$$r = \frac{E - V}{I}$$

(d) Work out the value of e where (1 ½ mks)

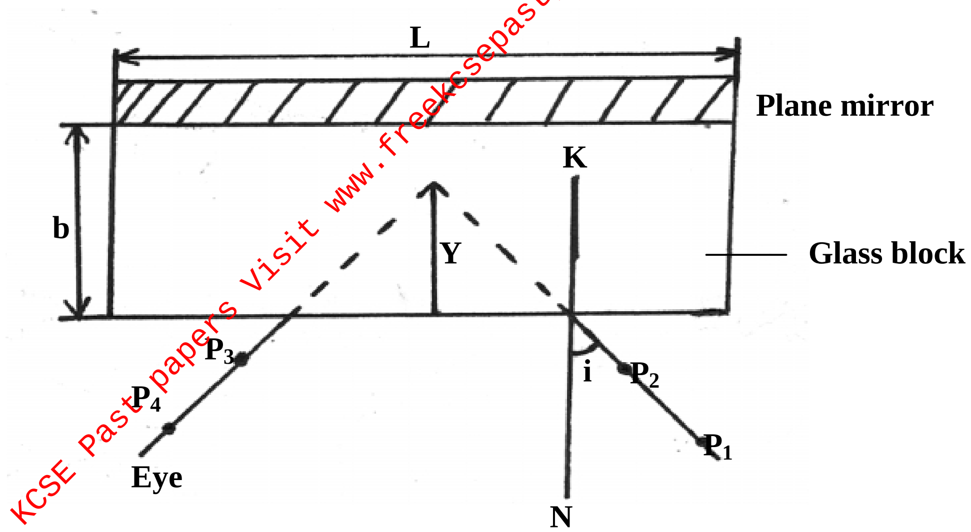
$$e = \frac{\Pi r d^2}{2.52}$$

Question 1 part B

You are provide with

- Rectangular glass block
- Four optical pins
- Ruler
- Soft board
- Plain paper
- Cellotape
- Vernier calipers (to be shared)

(e) Set up the apparatus as shown in figure below



Proceed as follows

(f)(i) Using the vernier calipers provided, measure and record the breadth b of the glass block
b=__________________________cm (½ mk)

(ii) Using cellotape , fix the mirror on one side (length) of the glass block and trace its outline on the plain paper
(iii) Draw the normal NK to the side AB and measure angle i=10° from the normal
(iv) Draw the line representing the incident ray and fix pins P1 and P2 as shown in the figure
(v) By observing the images of the pins P1 and P2, locate the position P3 and P4 such that they appear in a line (no parallax) using other pins
(vi) Join the points P3 and P4 and extend them to intersect line P1P2 produced. Measure the perpendicular distance Y
(vii) Repeat steps(iii-vi) for different values of I given and record your values in the table 2 below
Table 2

i^o	10	20	30	40
Y(cm0				

(g)(i) Determine the average of the values of Y (1mk)

(ii) Determine the values of constant k given that $k = \frac{b}{Y}$ (1mk)

2. **PART A**

You are provided with the following

- Metre rule
- Knife edge
- 10 microscope slides
- A 50g mass
- A piece of cellotape
- A pair of vernier calipers

Proceed as follows

(a) Using the vernier calipers provided measure the length l and the width of the microscope slide
L=______________________________

W=______________________________ (1mk)

(b) Stack ten(10) slides together using a cellotape as shown below fig 3

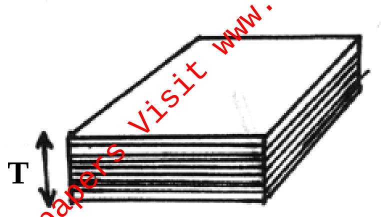
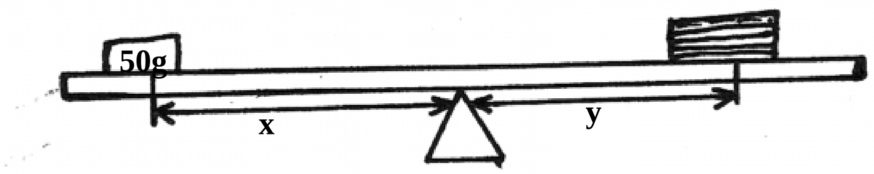


Figure 3

(i) Measure the thickness T of the space of microscope slab (1mk)
T=______________________

(ii) Determine the volume v of the stack (1mk)
V=(WT)
=____________________

(c) Balance the metre rule at its centre of gravity and maintain the position of the fulcrum on the centre of gravity throughout the experiment
Place the 50g mass and the stack of slides as shown in figure 4 below



Adjust the position of both the spaces and the mass until the rule is again balanced make the distances x and y as large as possible

(i) x=_______________ (1mk)
y=_______________

(ii) Calculate the mass M in grams of the stick of slides given that (1mk)

$$m = 50\frac{x}{y}$$

(iii) Determine the density of glass given that $density = \frac{m}{v}$ (1mk)

PART B

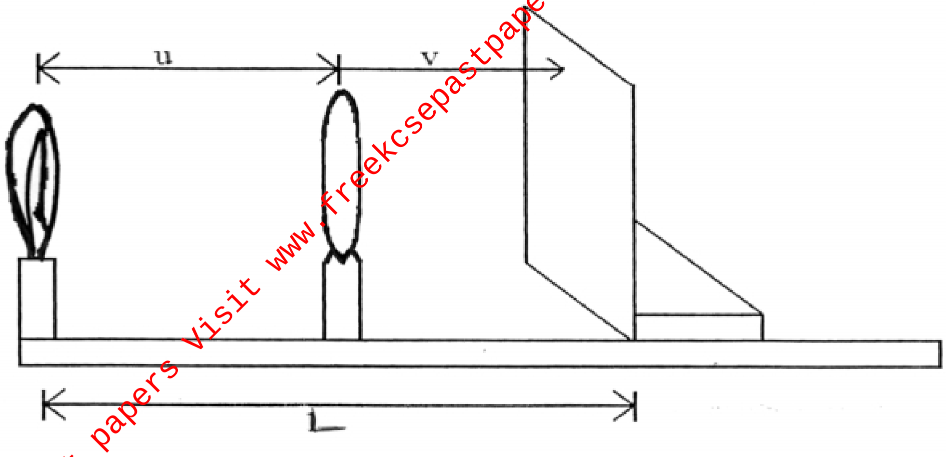
(d) You are provided with a metre rule, a lens holder, convex lens, a candle amounted white screen

proceed as follows

(e) Set up the apparatus as shown in figure 5 below

(f) Ensuring that L=100cm adjust the lens until you get a sharp diminished image on the screen.

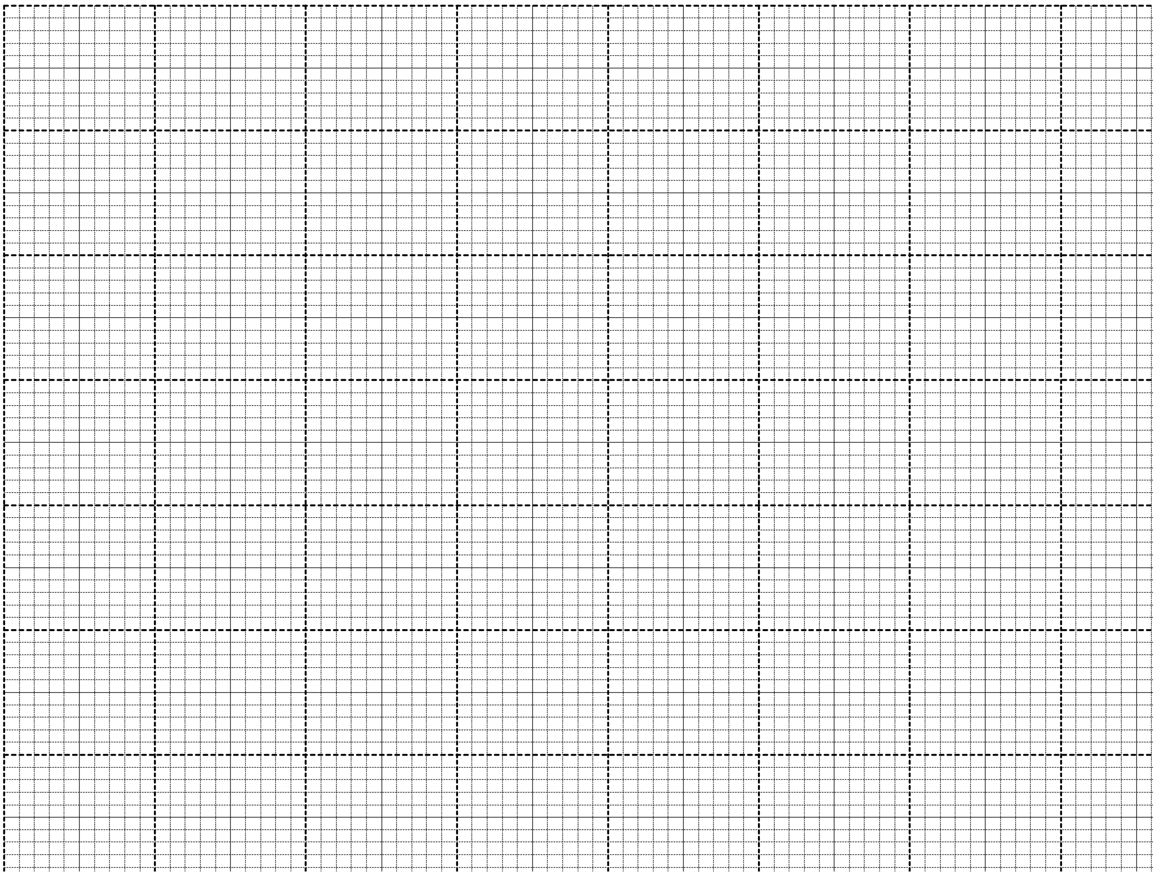
Measure the object distance u, and image distance v



(g)(i) Repeat the procedure with L=95cm, 90cm, 85cm,80cm and 75cm each time recording the value of u and v and tabulating the results in the table II below (5mks)

L(cm)	100	95	90	85	80	75
U(cm)						
V(cm)						
$m = \frac{v}{u}$						

(ii) Plot a graph of m against v (5mks)



(iii) Determine the slope of the graph (2mks)

(iv) Given that $\frac{v}{f} = m + 1$, determine the focal length of the lens from the graph above (2mks)