Name:.....Class:.....

Index number:...../.....Adm No:.....

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

232/3
PHYSICS PRACTICAL
PAPER 3
JULY 2013
2 ½ HOURS

ALLIANCE HIGH SCHOOL TRIAL EXAMINATIONS
Kenya Certificate of Secondary Education

Write your name, index number and sign in the spaces provided above.

Write the date of examination in the spaces provided above.

Answer ALL the questions in the spaces provided above in the question paper

You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the whole paper carefully before commencing your work.

Marks are given, for 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 10 printed pages

Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.

PART A

You are provided with the following;

- Glass marble
- Watch –glass
- Plasticine
- Stop watch
- Micrometer screw gauge

Proceed as follows:

a) Using a micrometer screw gauge measure the diameter, d of the marble
Diameter, d= ----------mm (1/2 mark)

b) Arrange the apparatus provided as shown in figure 1

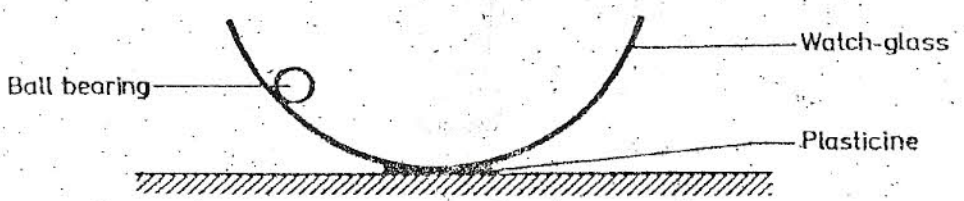


Figure 1

c) Release the marble from one end of the watch glass, measure and record the time the marble takes to complete 10 oscillations
t= _____ s (1/2 mark)

d) Determine the period T of the oscillation

T = _____ s (1/2 mark)

Given that $T = \frac{2\pi}{g}\sqrt{7(2b - d)}$

(Take gravitational field intensity, g to be 10N/kg)

e) Find the value of **b** the constant of the glass marble (1 mark)

PART B

You are provided with the following apparatus;

-A bi-convex lens labeled **A**
-A plane mirror
-One stand, one boss and one clamp
-A supply of water
-A 50mm x10mm manila card with a millimetre scale
-Two wooden blocks

Proceed as follows:

a) Clamp the wooden blocks so that they hold the object card horizontal, with the calibrated side upwards.
b) Place the plane mirror on a horizontal surface directly below the object card and place the lens at the centre of the mirror as in figure 2.

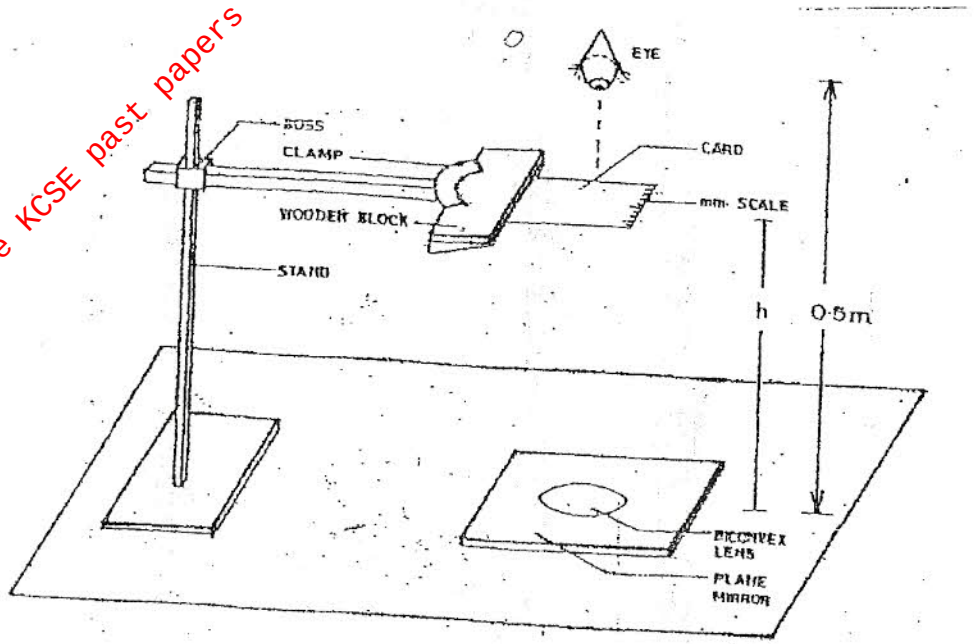


Figure 2

c) Measure a height **h**, where **h**=20 cm measured from the surface of the mirror.

d) Keeping your eye about 0.5 m from the mirror adjust the position of the mirror and lens so that you can see an image of the card in the central region of the lens.

e) By means of a millimeter scale on the top side of the object card determine the width, **b**, of the image.

b _____ **mm**

f) Repeat the experiment to obtain a series of corresponding values of **h** and **b** and record the results in table 1.

NOTE- (**invert the card for the images larger than the object so that the calibrated side faces the mirror.**)

Determine the image width by relating to the object width.

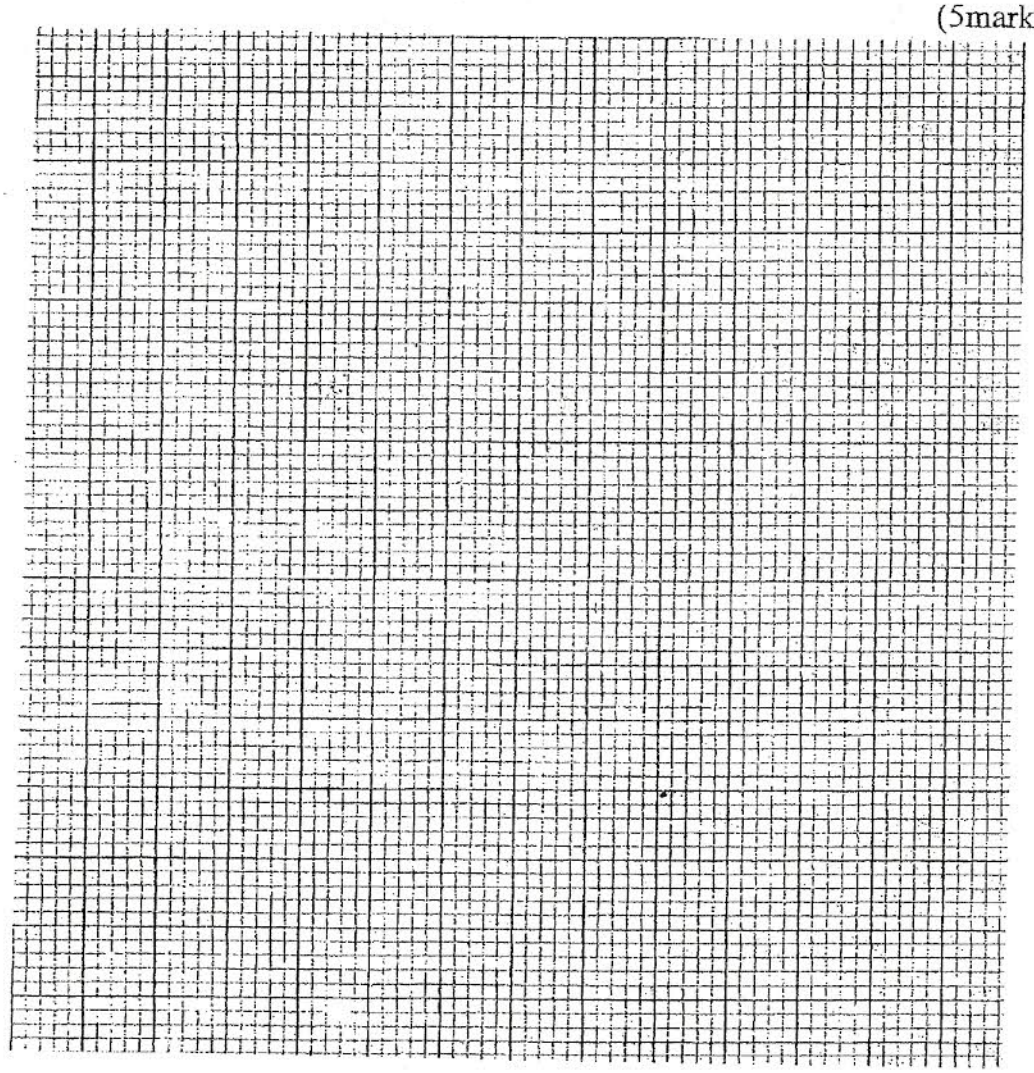
Table 1

h/cm	15	18	20	23	25	28
b/mm						

(2marks)

g) On the grid provided plot a graph of width **b** (y-axis) against height **h**.

(5marks)



h) Remove the lens and put a few drops of water in the centre of the mirror. Replace the lens on top of the water so that the water fills central region of the lens.

i) Repeat step (e) to obtain a series of corresponding values of **h** and new image width **w**.

Record the results in table 2

Table 2

h/cm	21	22	23	24	25	30	33	36
w/mm								

(2 marks)

j) Using the same axes as in (g) plot a graph of width **w** (y-axis) against height **h**. (3 marks)

From the graphs determine:

(i) $\mathbf{h_b}$ the value of h when b= 10mm

$\mathbf{h_b}$=_____ (1/2mark)

ii) h_w the value of h when w=10mm

h_w= _____ (1/2mark)

k) Determine the constant k for the water from the expression

$k=2\frac{h_b}{h_w}$

(1mark)

_____

_____

Question 2

You are provided with the following apparatus:

- an electric component x
- a thermometer
- Retort stand, boss and clamp
- two dry cells in
- a cell holder
- A milliameter
- a switch
- a beaker that is ¾ full of water
- seven connecting wires
- Bunsen burner
- tripod stand and wire gauze

a) i) Name the colour code of the carbon resistor labeled A.

_____ (1/2 mark)

ii) Hence state the numerical value of resistor A.

_____ (1/2 mark)

b) Connect two dry cells in series in a cell holder and measure the **emf** of the battery.

_____ (1/2 mark)

c) Connect the circuit in the figure 4 and record the current and potential drop across the resistor A and device x when the switch is closed. Record the observation in table 3.

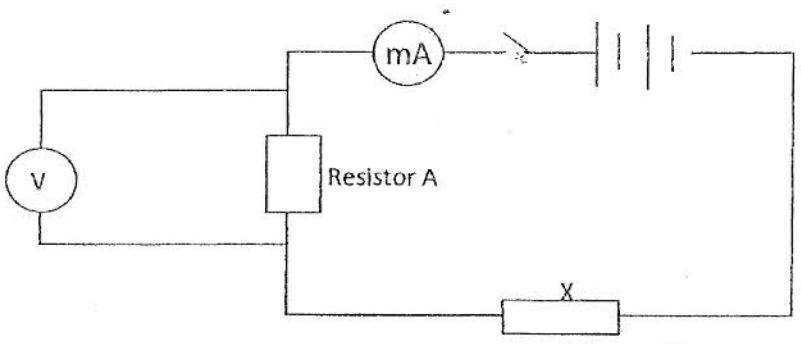


Figure 3

Table 3

Element	Current I (mA)	p.d V(V)	V/I
Resistor A			
Component X			

(3 marks)

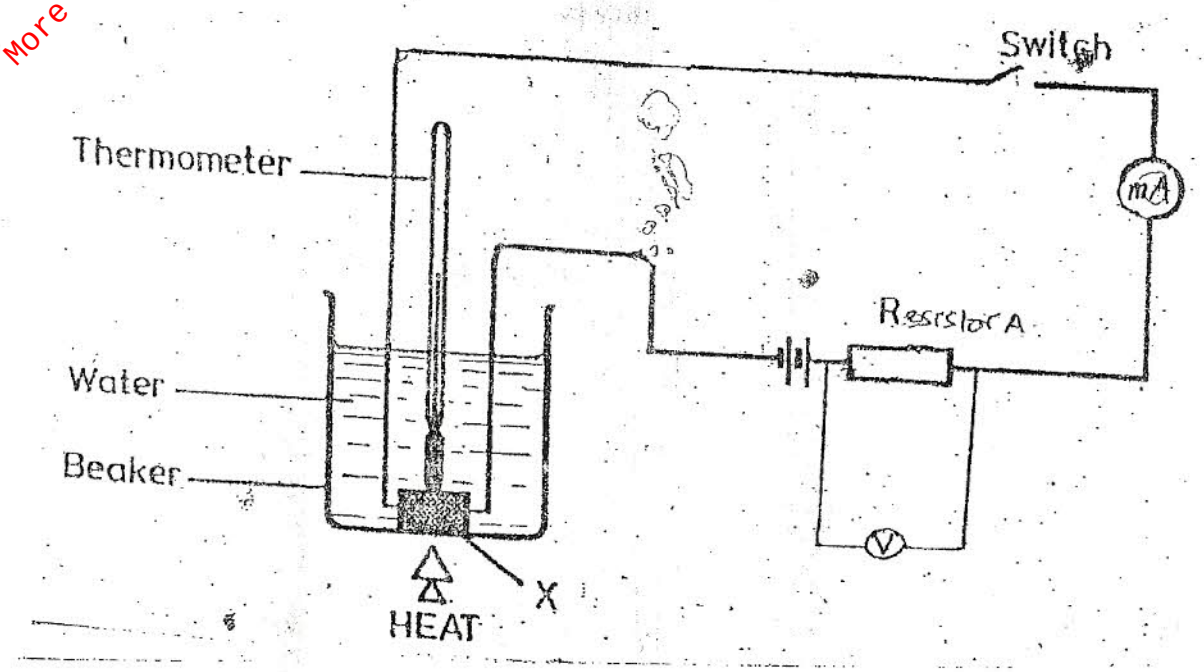


Figure 4

Using the circuit in figure 4 immerse the component X in water as in figure 4.

Heat the water bath to increase the temperature and record the corresponding current and voltage across component X in table 4, hence complete the table. (8marks)

Temperature, θ(°C)	25	35	50	60	65	75	80
Temperature, T(K)							
Current(mA)							
Current (A)							
Rd, V(V)							
R_x=V/I							
Log R_x							
Log T							

d) Plot a graph of Log R against Log T (5marks)