

**232/3  
PHYSICS  
PAPER 3  
PRACTICAL  
JULY / AUGUST 2010  
2 ½ HOURS**

**FORM FOUR MID YEAR CONTINUOUS ASSESSMENT TEST 2010  
Kenya Certificate of Secondary Education  
PHYSICS  
PAPER 3  
2 ½ HOURS**

**INSTRUCTIONS TO CANDIDATES**

- Write your name and index number in the space provided above.
- Answer all questions in the spaces provided 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 a clear record of observation 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.

**FOR EXAMINER'S USE ONLY**

Question 1									
Score									
Grand Total Score									

Question 2									
Score									
Grand Total Score									

GRAND TOTAL

*This paper consists of 8 printed pages*

**Turn Over**

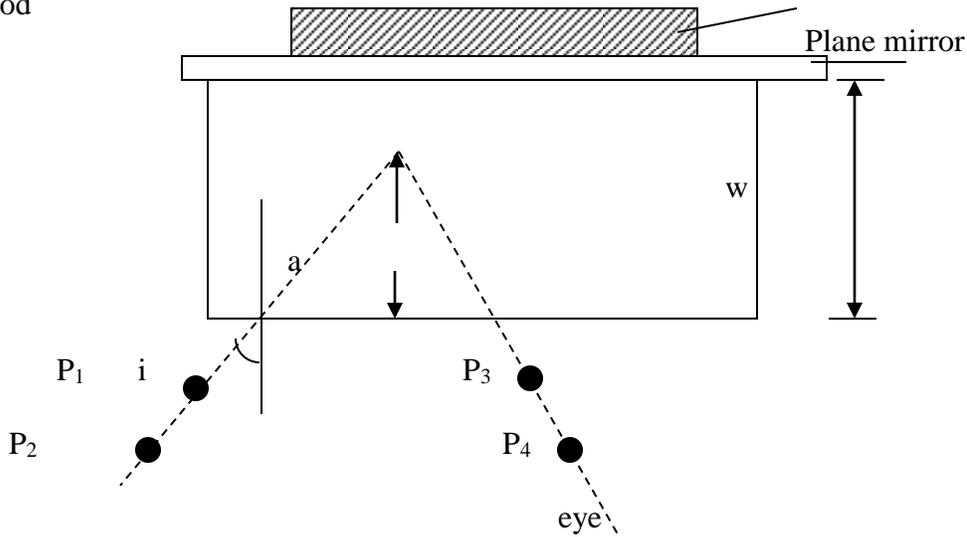
**QUESTION 1**

You are provided with the following

- A rectangular glass block
- A plane mirror mounted in a piece of wood to stand vertically
- Four optical pins
- Soft board
- Sheet of paper
- 4 thumb pins
- Vernier callipers

- (a) Place the plain sheet of paper on the soft board and fix it using the thumb pins. Place the glass block on the soft board and trace its outline.
- (b) Remove the glass block and draw a normal at about 2cm from the end of the longer side of the glass block outline.
- (c) Draw a line at an angle  $i = 10^\circ$  from the normal. Fix two pins P1 and P2 on the line
- (d) (i) Arrange the glass block and the plane mirror as shown below.

Piece of wood



- (d) (ii) Repeat the procedure for other values of  $i$  and complete the table below.

$i^\circ$						
Distance a (cm)						

( 6 marks )

- (e) Draw the graph of a ( Y axis ) against  $i$

( 5 marks )

2.

(f) Find the slope  $s$  of the graph.

( 3 marks )

(g) Use your graph to determine the maximum value of  $a$

( 1 mark )

(h) Given that  $a = mi + k$  where  $m$  and  $k$  are constants, find the values of  $m$  and  $k$ .

(i)  $m =$

( 1 mark )

(ii)  $k =$

( 1 mark )

(i) Measure the width  $w$  of the refracting glass using vernier calipers.

$W =$  \_\_\_\_\_

( 1 mark )

(j) For  $i = 30^\circ$  determine the value of  $X = \frac{W}{a}$  \_\_\_\_\_

( 1 mark )

4.

(k) What physical quantity does X represent?

( 1 mark )

NB: Hand in the sheet of paper with the traces representing the rays of light you used for determination of a and i.

## QUESTION 2

You are provided with the following

- An ammeter
- A voltmeter
- Two dry cells
- Resistance wire moulded on mm scale
- Torch bulb and a bulb holder
- A cell holder
- Switch
- Crocodile clip / Jockey

(a) Connect the apparatus provided as shown in the diagram below

(b) With the crocodile clip / jockey at C, 10cm from A, switch on the current and record the voltmeter reading in the table below.

(c ) Repeat the experiment in (b) above for other lengths shown in the table 2 below.

L(cm)								
V								

4 marks

(d) Plot a graph of p.d (V) against L(cm)

( 5 marks )

5.

(e) Determine the slope  $S$  of the graph.

( 3 marks )

(f) Replace the voltmeter with a bulb and an ammeter connected in series as shown in the circuit diagram below.

(g) Read and record the ammeter reading  $I_1, I_2, I_3$  for the corresponding values of lengths

$L_1 = 30\text{cm}$  ,                       $I_1 =$

$L_2 = 50\text{cm}$  ,                       $I_2 =$

$L_3 = 70\text{cm}$  ,                       $I_3 =$

( 2 marks )

(h) Given that  $V = LS$  where  $V$  is the p.d across the length  $AC$  of the wire,  $S$  is the slope of the graph in d above and  $L$ , the length of the resistance wire. Determine the p.d  $V_1, V_2$  and  $V_3$  across the length  $AC$  of the wire for lengths  $L_1, L_2$  and  $L_3$  in (g) above.

$V_1 =$  \_\_\_\_\_

$V_2 =$  \_\_\_\_\_

$V_3 =$  \_\_\_\_\_

( 2 marks )

7.

(i) Using the values of  $V_1$ ,  $V_2$  and  $V_3$  and the corresponding currents  $I_1$ ,  $I_2$  and  $I_3$  calculate the corresponding resistances  $R_1$ ,  $R_2$  and  $R_3$ . (Use the relation  $V = IR$ ) ( 3 marks )

(j) Compute the average value of the resistance  $R_{av}$  of the bulb. ( 1 mark )

$R_{av} =$

