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

Class ……………………..Candidate's Signature:………………………Date………..….

232/3
PHYSICS - PRACTICAL
TIME: 2 ½ HRS

KAMDARA JOINT - 2016

Instructions

- *Write your name, admission number, class and signature in the spaces provided at the top of the page.*
- *Answer **all** the questions in the spaces provided in this 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 your start.*
- *Marks will be given for clear record of observations actually made, for their suitability and accuracy, and the use made of them.*
- *Candidates are advised to record their observations as soon as they are made.*
- *Electronic calculators and mathematical tables may be used.*

FOR EXAMINER'S USE ONLY

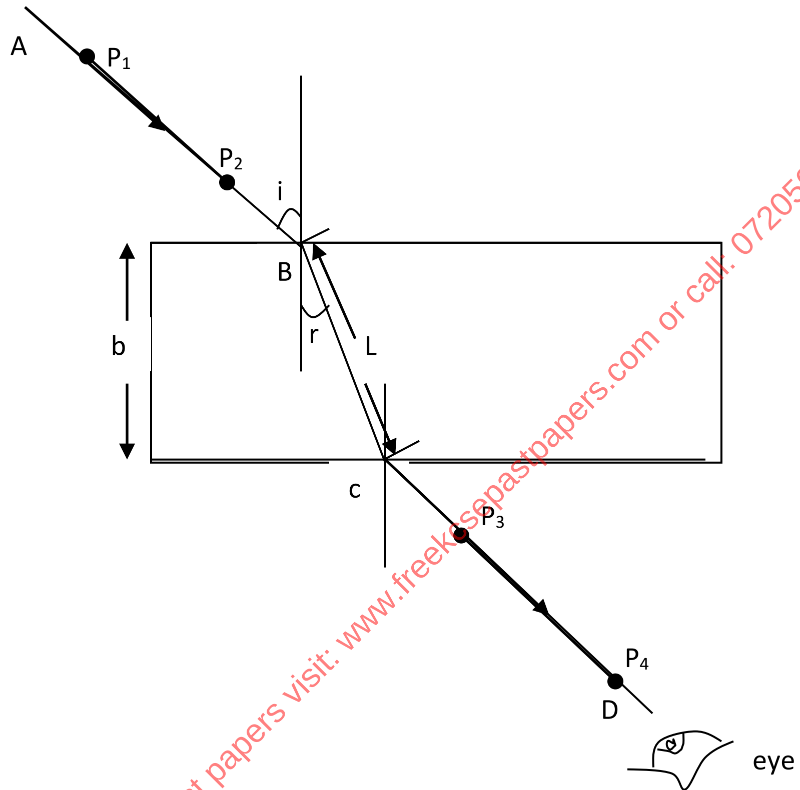
Question(s)	Maximum Score	Candidate's Score
1	20	
2	a) 16	
	b) 4	
TOTAL	**40**	

*This paper consists of **10** printed pages. Candidates are advised to check and to make sure all pages are printed.*

- a rectangular glass block
- 4 optical pins
- a soft board
- a plain paper

Proceed as follows:

(a) Place the glass block on the plain paper with one of the largest face upper most. Trace round the glass block using a pencil as shown below.



(b) Remove the glass block and construct a normal at B. Construct an incident ray AB of angle of incidence, $i = 20^0$.

(c) Replace the glass block and trace the ray ABCD using the optical pins.

(d) Remove the glass block and draw the path of the ray ABCD using a pencil. Measure length L and record it in the table below.

Angle i^0	L (cm)	L^2 (cm^2)	$\frac{1}{L^2}(cm^{-2})$	$Sin^2 i$
20				0.1170
30				0.2500
40				0.4132
50				0.5868
60				0.7500
70				0.8830

(6 marks)

(e) Repeat the procedure above for the angles of incidence given.

(f) Calculate the value of L^2 and $\frac{1}{L^2}$; Record in the table.

(g) Plot a graph of $\frac{1}{L^2}$ (y-axis) against $\text{Sin}^2 i$.**(5 marks)**

(h) Calculate the gradient, S. **(3 marks)**

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Given that the equation of that graph is: $\frac{1}{L^2} = -\frac{1}{n^2b^2} \cdot \left(Sin^2 i + \frac{1}{b^2}\right)$

(i) Determine the $\frac{1}{L^2}$ – intercept C and the Sin$^2 i$ – intercept B.

C = ____ **(1 mark)**

B = ____ **(1 mark)**

(j) Calculate the value of Q given by; **(2 marks)**

$$Q = -\left(\frac{C}{S}\right) \div B$$

(k) Hand in your constructions on the plain paper together with the answer script. **(2marks)**

QUESTION 2

PART A

You are provided with the following:

- Two dry cells and a cell holder
- One voltmeter (0 – 5V)
- One ammeter (0 – 1A) or (0 – 2.5A)
- Six resistors labeled AB
- One resistor labeled R
- A switch
- 7 connecting wires

(a) Set up the circuit as shown in figure 2

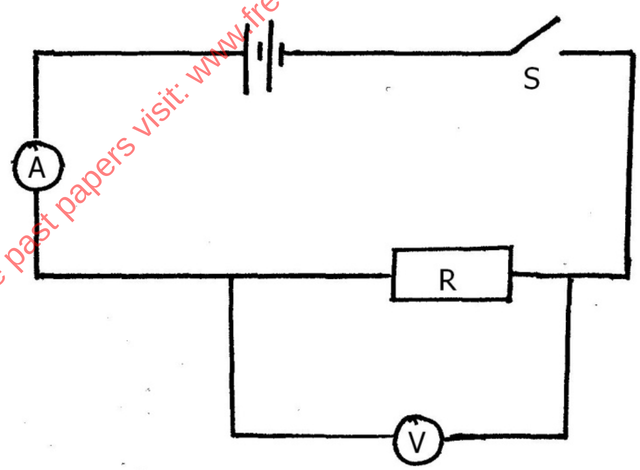

FIG 2

(i) Close the switch, s. Read and record the voltmeter and ammeter readings (1mks)

V = _______________________ volts

I = _________________________ Amperes

(ii) Determine the value of R given that $R = \frac{V}{I}$ (1mk)

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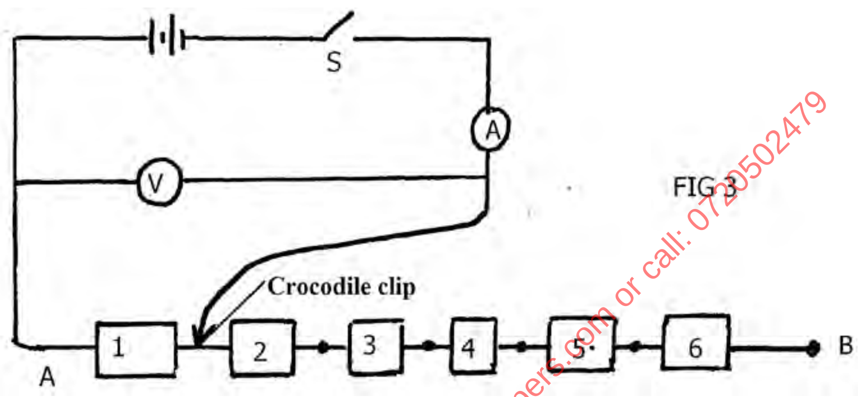
(b) Set the circuit as shown in figure 3



(i) With the crocodile clip across resistor 1 as shown in figure 3 above, close the switch, read and record the ammeter and voltmeter readings in table.

(ii) Repeat the procedure b (i) with crocodile clips across resistors 2, 3, 4, 5 and 6 respectively, each time recording the corresponding values for V and I in table 2

Number of resistors	1	2	3	4	5	6
p.d. (volts)						
Current I (Amperes)						

Table 2

(4mks)

(c) On the grid provided plot the graph of p.d (V) (y axis) against I (A) (5mks)

(d) Determine the slope of the graph at:

(i) p.d = 2.5V (2mks)

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……
……

(ii) p.d = 2.8V (2mks)

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(iii) What physical quantity is represented by the slope of your graph at any one point? (1mk)

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PART B

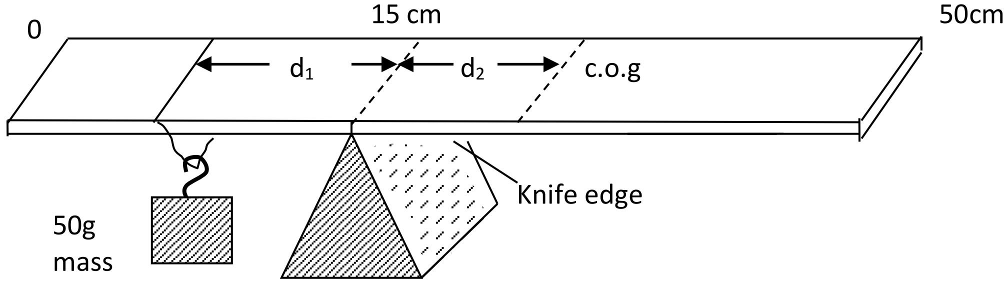
You are provided with the following;

- Half-metre rule
- Knife edge (raised)
- A thread (approx. 20cm in form of a loop)
- 50g mass

(a) Determine the c.o.g of the half-metre rule.

c.o.g. = ______________________ cm mark. **(1 mark)**

(b)



(i) Pivot the rule at 15cm mark and balance it with the mass as shown. When it is well balanced, note and record the position of the 50g mass; **(1 mark)**

Position of 50g mass = ________________ cm mark

(ii) Use your results to determine the weight of the rule. **(2 marks)**