

NAME: INDEX NO:

ADM. NO. SIGNATURE: DATE:

232 / 3
PHYSICS
PAPER 3
(PRACTICAL)
MARCH / APRIL 2013
TIME: 2 ½ hours

MOKASA JOINT EXAMINATION 2013

Kenya Certificate of Secondary Education (KCSE)

PHYSICS

PAPER 3

TIME: 2 ½ HOURS

INSTRUCTIONS TO CANDIDATES

- (a) Write your Name, Index Number and Admission number in the spaces provided above.
- (b) Sign and write the date of Examination in the spaces provided above.
- (c) Answer all questions in the spaces provided.
- (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 will be given for clear records of 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) All working must be clearly shown where necessary.
- (h) Mathematical tables and silent electronic calculators may be used.
- (i) This paper consists of 11 printed pages. Candidates are advised to check that all pages are printed as indicated and no questions are missing.

FOR EXAMINER'S USE ONLY

Question 1	(e)	(f)	(g)	(h)	TOTAL
Max. Score	9	5	3	3	20
Candidate's Score					
Question 2	(f)	(g)	h(i)	h(ii)	TOTAL
Max. Score	9	5	3	3	20
Candidate's Score					

GRAND TOTAL

Question one (20 Marks)

You are provided with the following:

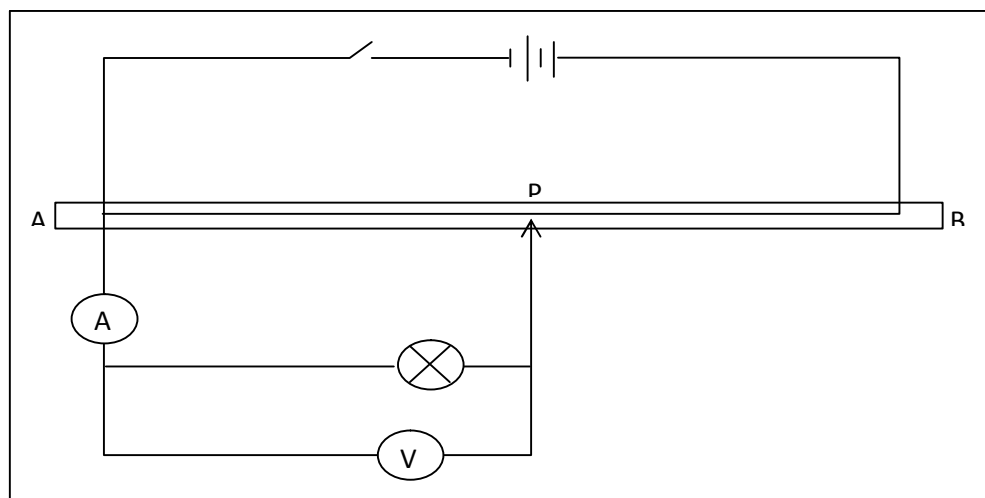
- A 100cm nichrome wire mounted on a millimeter scale **AB**.
- An ammeter.
- A voltmeter.
- 2 dry cells (1.5V each).
- A cell holder.
- A torch bulb and a bulb holder.
- Eight connecting wires at least 4 with crocodile clips.
- A switch.
- A Micrometer Screw gauge (to be shared)

(a) Measure the diameter d of the mounted wire at two different points.

d_1 d_2 (1 mark)

Average d = mm (1 mark)

(b) Connect the apparatus as shown **below**.



- (c) Place the sliding contact at $P = 20\text{cm}$ from A and then close the switch. Record the readings of both the current and voltage in the **table below**.
- (d) Repeat the above experiment by placing P at 40cm, 60cm, 70cm, 80cm and 100cm from A. Record your readings in the **table below**. (5marks)

Length L (cm)	Ammeter reading I (A)	Voltmeter reading p.d (V)
20		
40		
60		
70		
80		
100		

- (e) What happens to the bulb as L increases? (1 mark)

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- (e) (i) Plot a graph of I (A) against p.d. (V) on the grid provided. (5 marks)

(ii) Determine the slope of the graph at $V = 0.6V$, stating its SI units. (3 marks)

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(iii) Determine the cross-sectional area (A) of the wire in m^2 . (2 marks)

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(iv) Given that $V = \frac{\ell IL}{A}$, Find ℓ at $L = 0.70m$. (2 marks)

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Question 2 (20 marks)

You are provided with the following;

- Metre rule;
- Retort stand, a boss and clamp;
- Three pieces of thread;
- 200ml of water in a 250ml beaker labelled W;
- 200ml of a liquid in a 250ml beaker labelled L;
- Two masses labelled m_1 and m_2 .
- Piece of tissue paper

Proceed as follows:

- (a) Suspend the metre rule so that it balances at its centre of gravity **G**.

$G = \dots\dots\dots\text{cm}$ (1 mk)

Hang the masses as in shown **figure 2(a)**.

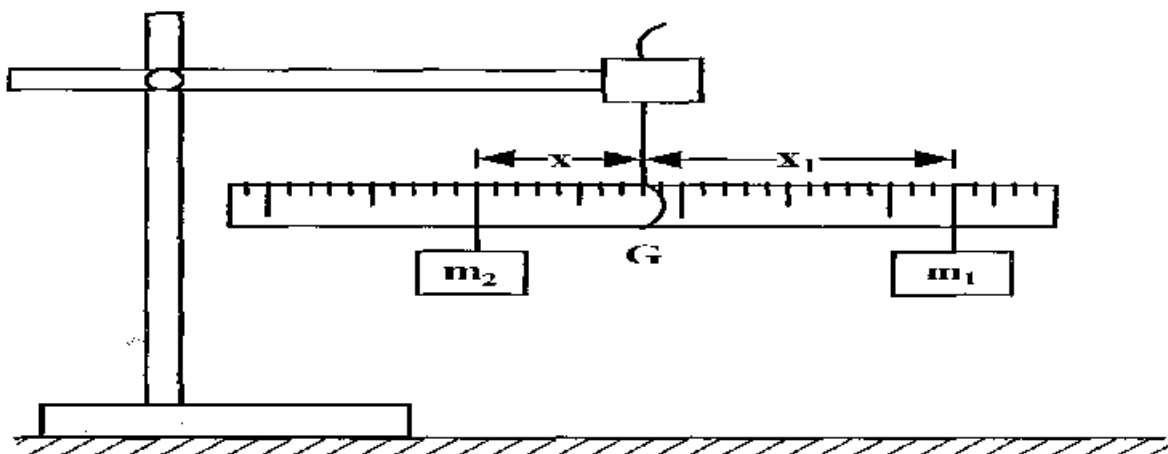


Figure 2(a)

(b) Position mass m_2 at a distance $x = 5 \text{ cm}$ from the centre of gravity G and adjust the position of m_1 so that the metre rule balances at G . Record x_1 , the distance of m_1 from the point G in **table 2**.

(c) While maintaining the distance $x = 5 \text{ cm}$, immerse m_2 completely in water. Adjust the position of m_1 until the metre rule balances again (**see figure 2(b)**). Record the new distance x_2 .

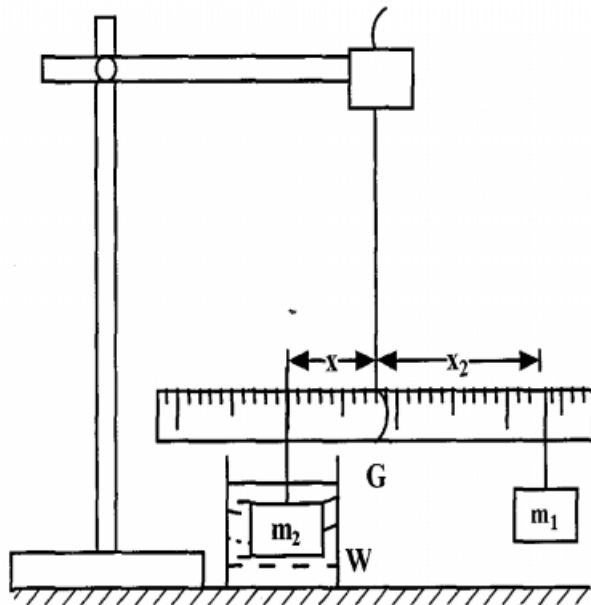


Figure 2(b)

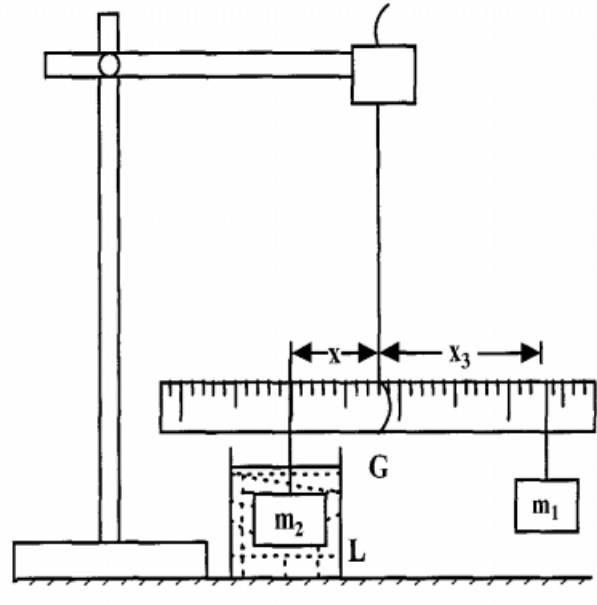


Figure 2(c)

(d) Still maintaining the same distance $x = 5 \text{ cm}$, remove the beaker, W with water and replace it with the beaker L with the liquid. Immerse m_2 completely in the liquid. Adjust the position of m_1 until the metre rule balances again (**see figure 2(c)**). Record the new distance x_3 .

(e) Remove mass m_2 from the liquid and dry it with a tissue paper.

(f) With the metre rule still suspended from its centre of gravity G , repeat the procedure in

(b), (c), (d) and (e) for other values of x given in **table 2**. Complete the table.

(8 marks)

Distance x (cm)	Distance x_1 (cm)	Distance x_2 (cm)	Distance x_3 (cm)	$L_0 = (x_1 - x_2)$ (cm)	$L_1 = (x_1 - x_3)$ (cm)
5					
10					
15					
17					
20					

(g) Plot a graph of L_0 (y-axis) against L_1

(5mks)

h) Find the slope S of the graph. (2mks)

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(i) Find the value of K given that $L_1 = \frac{25}{K} L_0$ (2mks)

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