

NAME..... ADM NO.....
 SCHOOL..... CANDIDATES SIGN.....
 DATE

232/3
 PHYSICS
 PAPER 3
 FORM THREE
 TIME: 2 ½ HOURS

END OF TERM (III) EXAMINATION -2019

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

232/3
 PHYSICS
 PAPER 3
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INSTRUCTIONS TO THE CANDIDATES

- Write your name, Admission number, class and date of examination.
- Answer all the questions in the spaces provided.
- 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 made, their suitability and accuracy.
- Candidates are advised to record their observations as soon as they are made.
- Non-programmable silent electronic calculators may be used.

FOR EXAMINERS USE ONLY

	PART A						PART B							TOTAL
	a	b	c	d	e	f	a	b	c	d	v	vi	vii	
Question 1														
Maximum Score	2	1	1	2	2	2	3	1	2	2	1	2	1	
Candidate Score														

Question 2	1	i	ii	iii	iv	Total
Maximum Score	6	5	3	4	2	
Candidate Score						

GRAND TOTAL

QUESTION 1

PART A

Q1. You are provided with the following apparatus

Meter rule

A marble

Complete stand

20g mass

A piece of thread

Micrometer screw gauge

A piece of cello tape

Proceed as follows

a) Using the micrometer screw gauge, determine the diameter of the marble

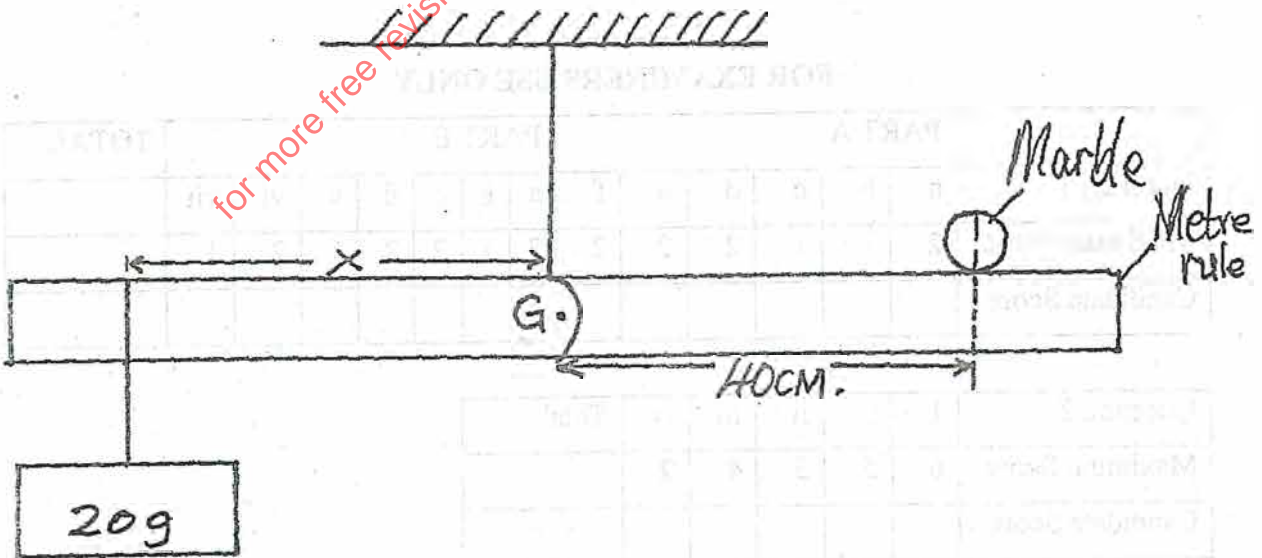
d _____ mm (1mk)

= _____ cm (1mk)

b) Using the piece of thread and the stand provided, balance the metre rule and determine its centre of gravity G

G = _____ cm mark (1mk)

c) Using the piece of cello tape, fix the marble on the metre rule 40cm from the support G obtained in (b) above. Balance the system by suspending the 20g mass using the piece of thread as shown in the figure



d) Determine the value of x

x = _____ cm (1mk)

- e) Use the principle of moments to calculate M , the mass of the marble in grammes (assume that the mass of cello tape is negligible) (2mks)
- f) Determine the constant n given that $n = \frac{6m}{\pi d^3}$ (2mks)

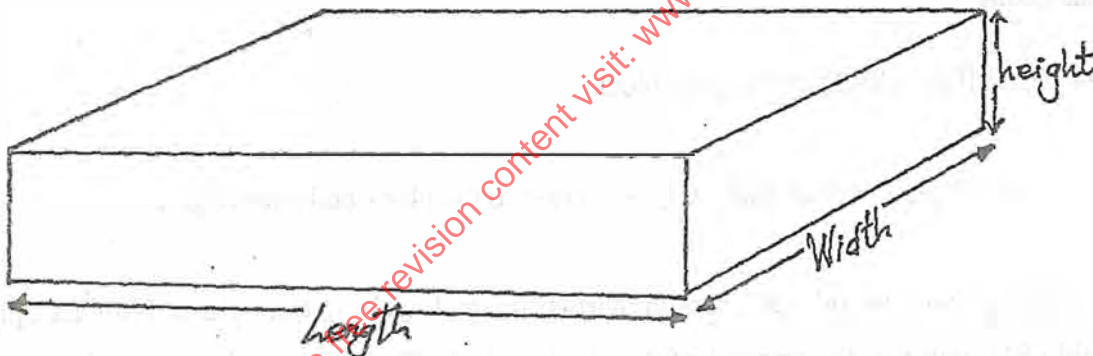
PART B

Q1. You are provided with the following

- A soft board
- A rectangular glass block
- A white sheet of paper
- A 30cm ruler
- A beam balance (to be shared)
- Two optical pins

Proceed as follows

- a) Use the ruler to measure the length, width and height of the glass block



- Length $L =$ _____ cm (1mk)
- Width $W =$ _____ cm (1mk)
- Height $H =$ _____ cm (1mk)

- b) Using the beam balance, determine the mass M of the glass block

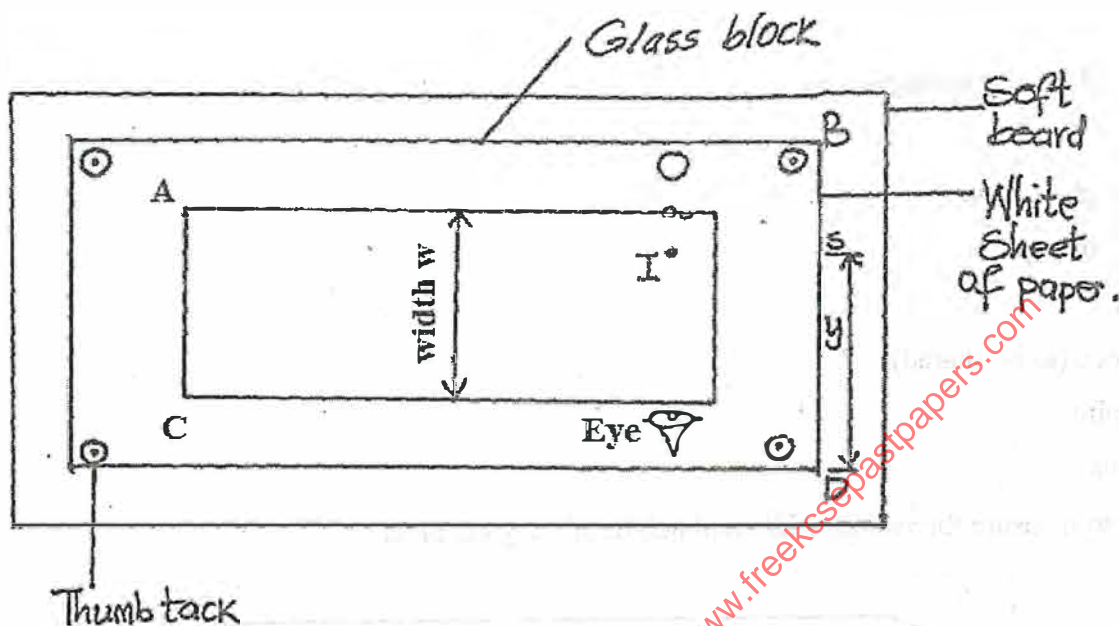
$M =$ _____ g (1mk)

- c) Calculate the volume V of the glass block (2mks)

d) Determine the density of the glass block

(2mks)

e) (i) Set the apparatus as shown in fig



(ii) Draw the outline ABCD of the glass block

(iii) Fix an optical pin O on the line, AB, very close to the block and near edge B

(iv) By viewing from the side DC, spot the virtual image I of the optical pin O. Now fix optical pin S on the side BC such that the image I of the pin O and pin S are on a straight line when viewed from the side DC as shown in the figure above

Remove the glass block and,

(v) Measure the length y from D to S

Y = _____ cm

(1mk)

(vi) Given that $K = \frac{W}{y}$, determine the value of K

(2mks)

(vii) Name the quantity represented by the value K

(1mk)

QUESTION 2

Q2. You are provided with the following apparatus

- A wire W mounted on a mm scale

Two dry cells

A cell holder

A voltmeter

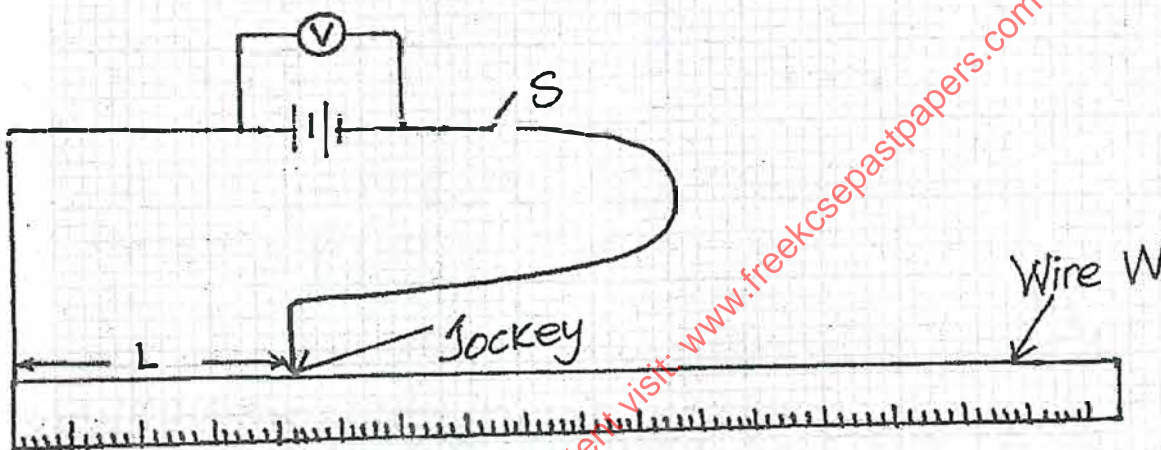
Five connecting wires

A switch

A jockey

Proceed as follows;

- a) Set the apparatus as shown in the figure below. Use the jockey to fix the length L of wire W at 15cm

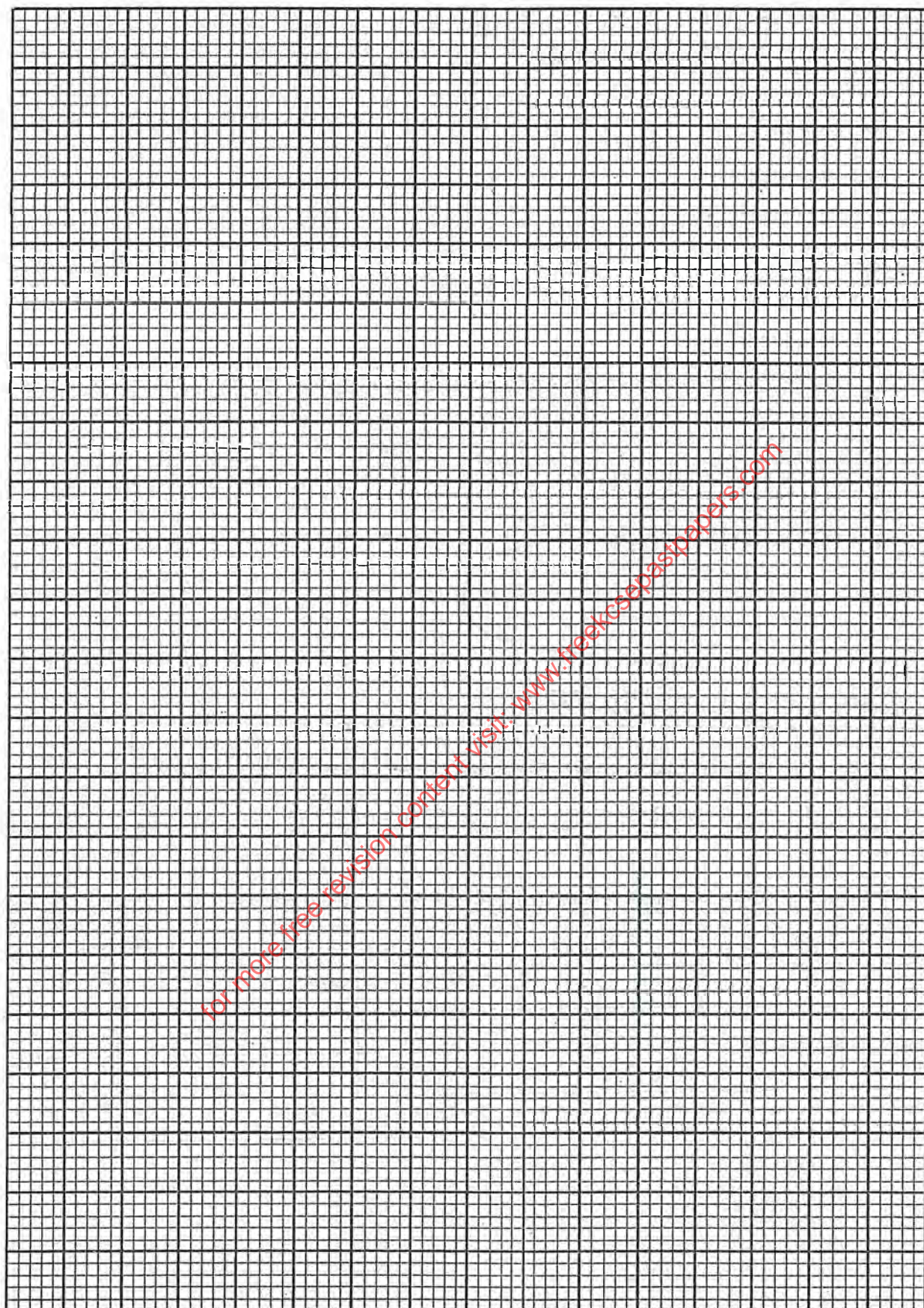


- b) Close the switch and record the voltmeter reading V in the table.
- c) Adjust the length L to 20cm and repeat step b above. Report for other values of L in the table and complete the table. (6mks)

L (cm)	15	20	25	30	40		
V (v)							
$1/L$ (cm ⁻¹)							
I/V (V ⁻¹)							

d) Plot a graph of $1/v$ against $1/L$

(5mks)



e) Determine the slope of the graph

(3mks)

f) Given that the equation of the graph is $\frac{1}{v} = \frac{K_1}{L} + K_2$ determine the value of

(i) K_1

(2mks)

(ii) K_2

(2mks)

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g) Determine the value of electromotive force (E) of the cells given that

(2mks)

$$K_2 = \frac{1}{E}$$

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