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

Class: …………………………

Signature:……………………

232/3
PHYSICS
PRACTICAL
July 2021
TIME: 2 ½ HRS

MOKASA EXAMINATION

Kenya Certificate to Secondary Education
PHYSICS PAPER 3
PRACTICAL

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 marks**	
2	**20 marks**	
TOTAL	**40 marks**	

This paper consists of **7** printed pages. Candidates are advised to check and to make sure all pages are printed.

1. You are provided with the following apparatus.

    - Voltmeter

    - A resistance wire, W mounted on a mm scale

    - Two dry cells and cell holders

    - 6 connecting wires

    - A switch

    - A jockey

    - Micrometer screw gauge (to be shared)

    Proceed as follows:

    (a) Connect your apparatus as shown in the figure below
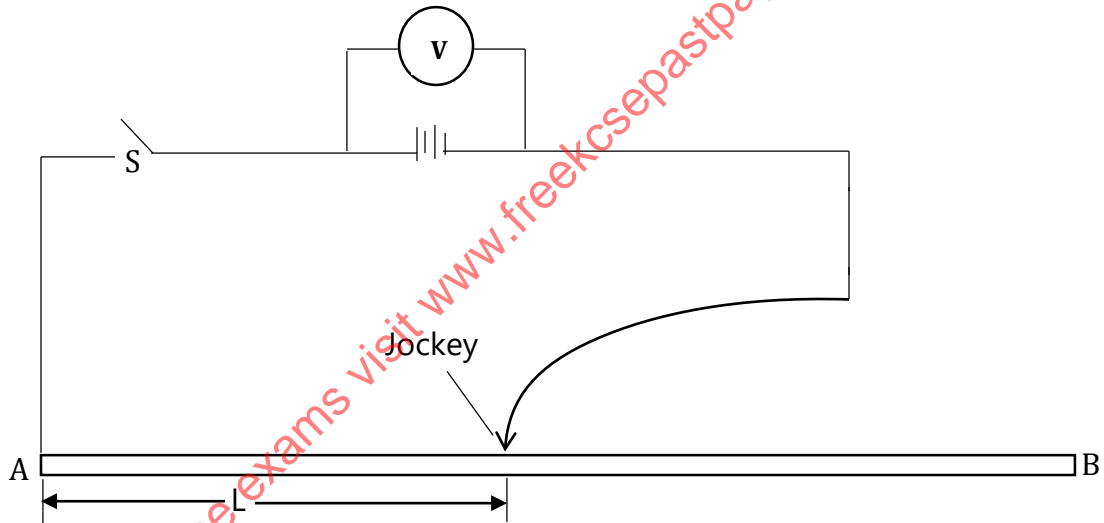
    (b) Measure the diameter, d of the resistance wire using a micrometer screw gauge.

    d ....mm   (1/2 mark)

    d ....m   (1/2 mark)
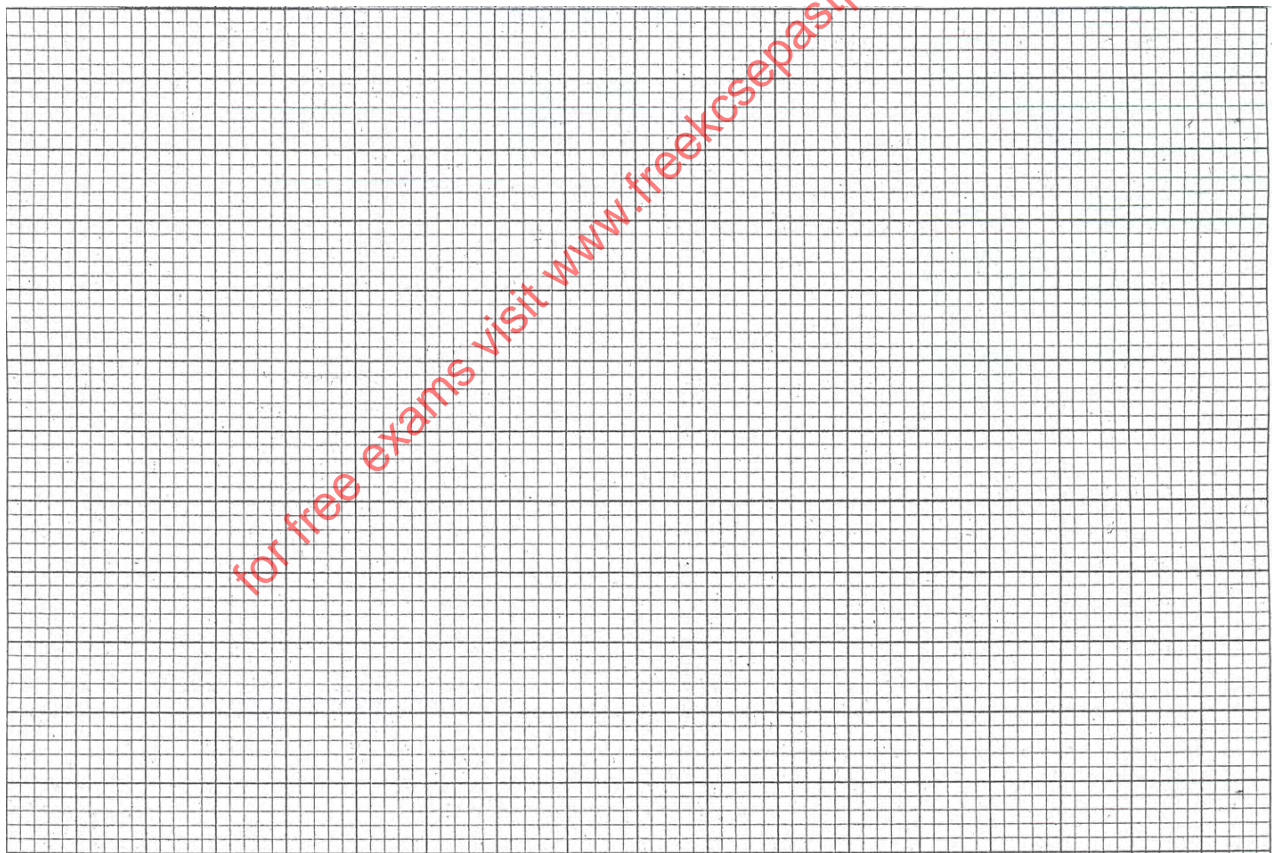
    (c) Place the jockey at L = 10cm, close the switch S. Read and record in the table the voltmeter reading.

(d)   Repeat the procedure in (c) for other values of **L** and complete the table

(7 marks)

Length, L. (cm)	10.0	20.0	30.0	40.0	50.0	60.0
Voltmeter, V(V)						
$\frac{1}{L}$ (m^{-1})						
$\frac{1}{V}$ (V^{-1})						

(e)   Plot a graph of $\frac{1}{V}$ (y-axis) against $\frac{1}{L}$.   (5 marks)

(f)   Determine the slope, **S** of the graph   (3 marks)

(g)   Given that the y-intercept **C** = $\dfrac{1}{E}$, find the value of **E**.   (2 marks)

(h)   Given that slope **S** is given by S = $\dfrac{\pi d^2}{\beta E}$ find the value of **β**   (2 marks)
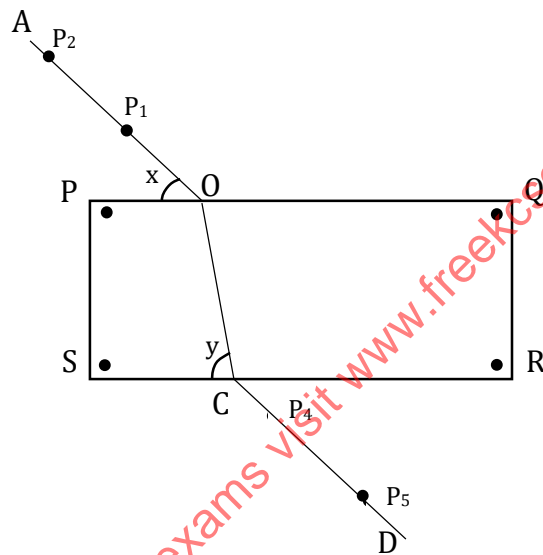
2. You are provided with the following apparatus:

   - 1 rectangular glass block
   - 4 optical pins
   - 4 thumb tucks
   - 1 soft board
   - 1 plain paper

Proceed as follows:

(a) Fix the plane sheet of paper on a soft board using thumb tucks as shown in the figure below

(b) Place the glass block on the sheet of paper so that it rests on its broader face and trace the outline PQRS.

(c) Remove the glass block.

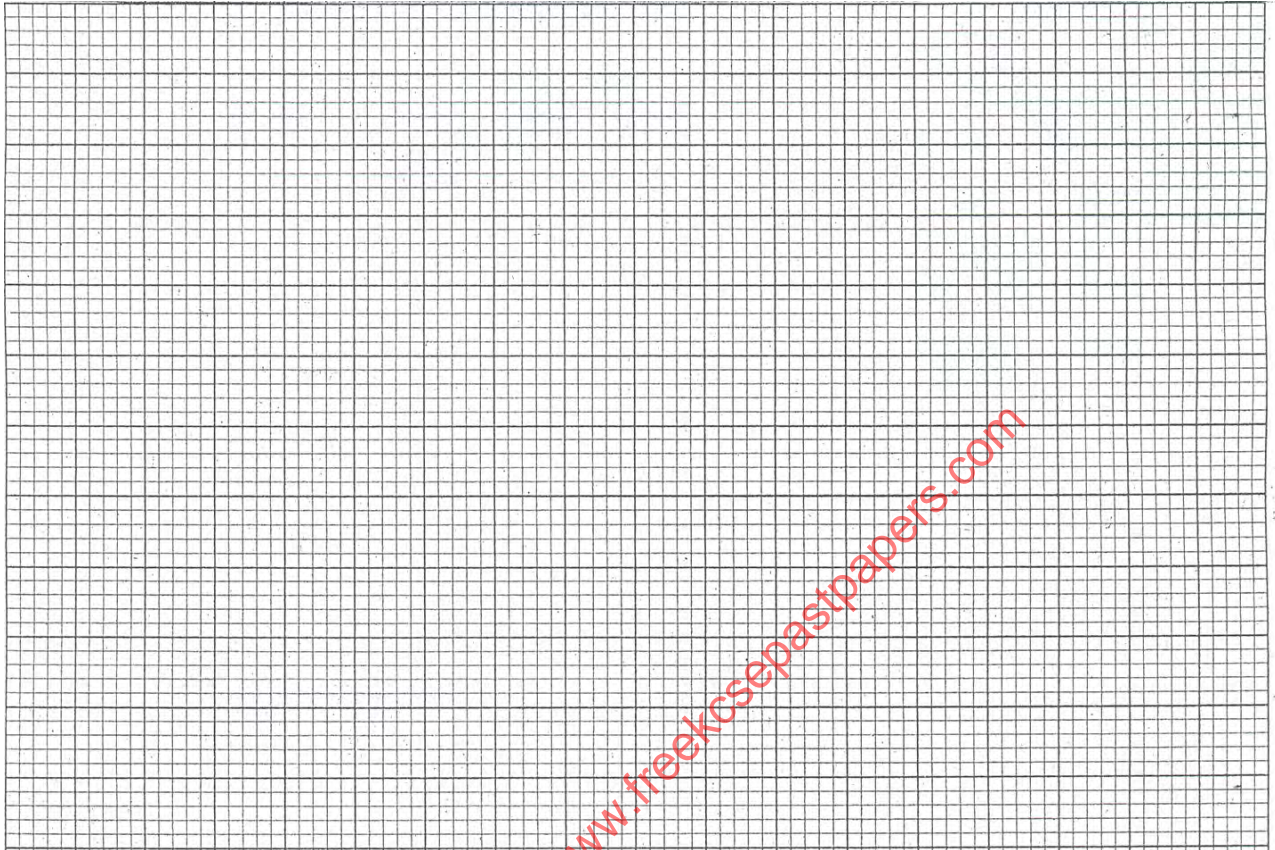(d) Draw a perpendicular to PQ at 0 such that PO is about ¼PQ.

(e) Draw a line AO such that angle $x = 15^0$

(f) Replace the glass block.

(g)   Stick two optical pins P_1 and P_2 on the line AO.

(h)   While looking through the glass block from side, SR, stick pins P_3 and P_4 such that they appear to be in a straight line with the images of pins P_1 and P_2.

(i)   Remove the glass block and pins.

(j)   Draw a line through the holes made by pins P_3 and P_4 to meet SR at C.

(k)   Join C to O.

(l)   Measure and record angle, y.

(m)   Repeat procedure (e) to (l) for x = 25^0, 30^0, 40^0, 50^0 and 60^0 and tabulate the data

(n)   Complete the table for values of sin (90^0 – x) and cos y.   (8 marks)

$X(^0)$	15^0	25^0	30^0	40^0	50^0	60^0
$Y(^0)$						
Sin(90 – x)						
Cos y						

(o)   Plot a graph of cos y (y-axis) against sin (90^0 – x).   (5 marks)

(p)   Find the slope, **S**, of the graph.   (3 marks)

(q)   Given that, t cos y = sin(90^0 – x), where t is a constant, use your graph to find the value of t.   (2 marks)

(r)   Identify the significance of constant, t   (1 mark)

NB: Hand in the trace-out together with your question paper