NAME: …… **ADM NO:** ……

SCHOOL: …… **Signature:** ……..

Date: ……

232 / 3
PHYSICS
PAPER 3
PRACTICAL
2 ½ HOURS

ASUMBI GIRLS HIGH SCHOOL
TERM 2– DECEMBER 2021
FORM 4 – PHYSICS PAPER 3

INSTRUCTIONS TO CANDIDATES

- *Write your name and Admission number in the spaces provided above.*
- *Answer **ALL** the 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 the 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.*
- *Mathematical table and electronic calculators **may be** used.*

FOR EXAMINER'S USE ONLY

Question	Score
1	
2	
Total	

This paper consists of 6 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

Turn Over

1. You are provided with the following apparatus
   - A metre rule
   - Two stands
   - A pendulum bob
   - Some plasticine
   - Stop watch
   - Protractor
   - Two pieces of strings (long and short one)

   Proceed as follows:

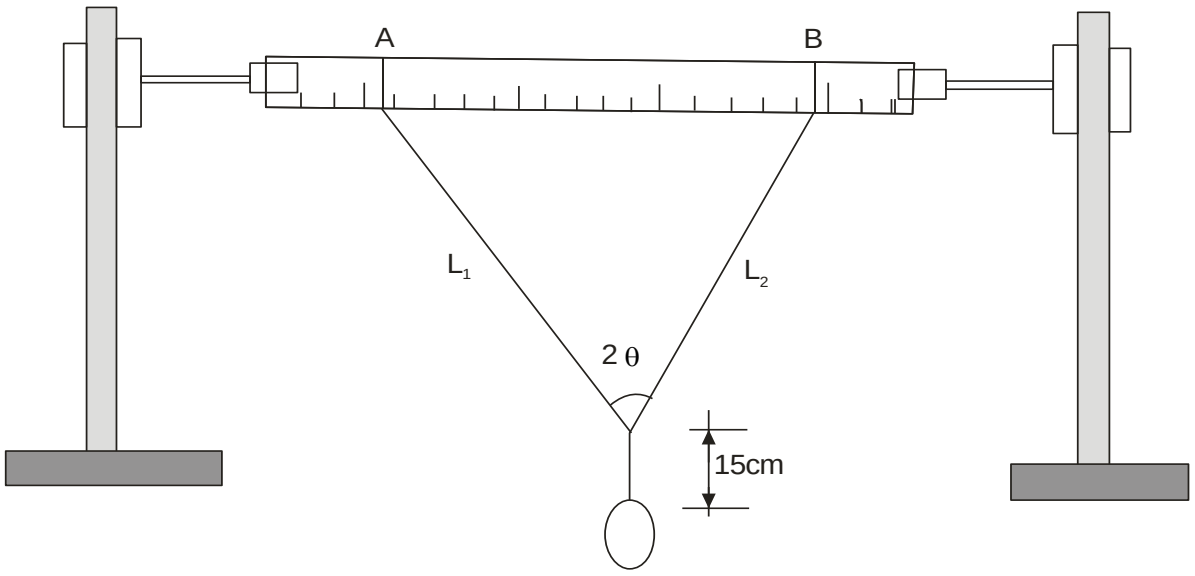
   a) Attach one end of the length of string to the metre rule at 10cm mark. Mark by use of a sliding loop of string round the meter rule.

   b) Fix the string at this point with the small bob of plasticine.

   c) Tie the string in a second loop at 90cm mark so that the string is stretched taught between the two marks.

   d) Fix this loop with a small plasticine. Attach the pendulum bob to the centre of the string so that the centre of gravity is 15cm below the point of suspension.

   e) If the attachments of the pendulum bob to the pieces does not produce a V-shape squeeze the string at the knot between the thumb and the fore finger.



i) Measure the angle 2θ

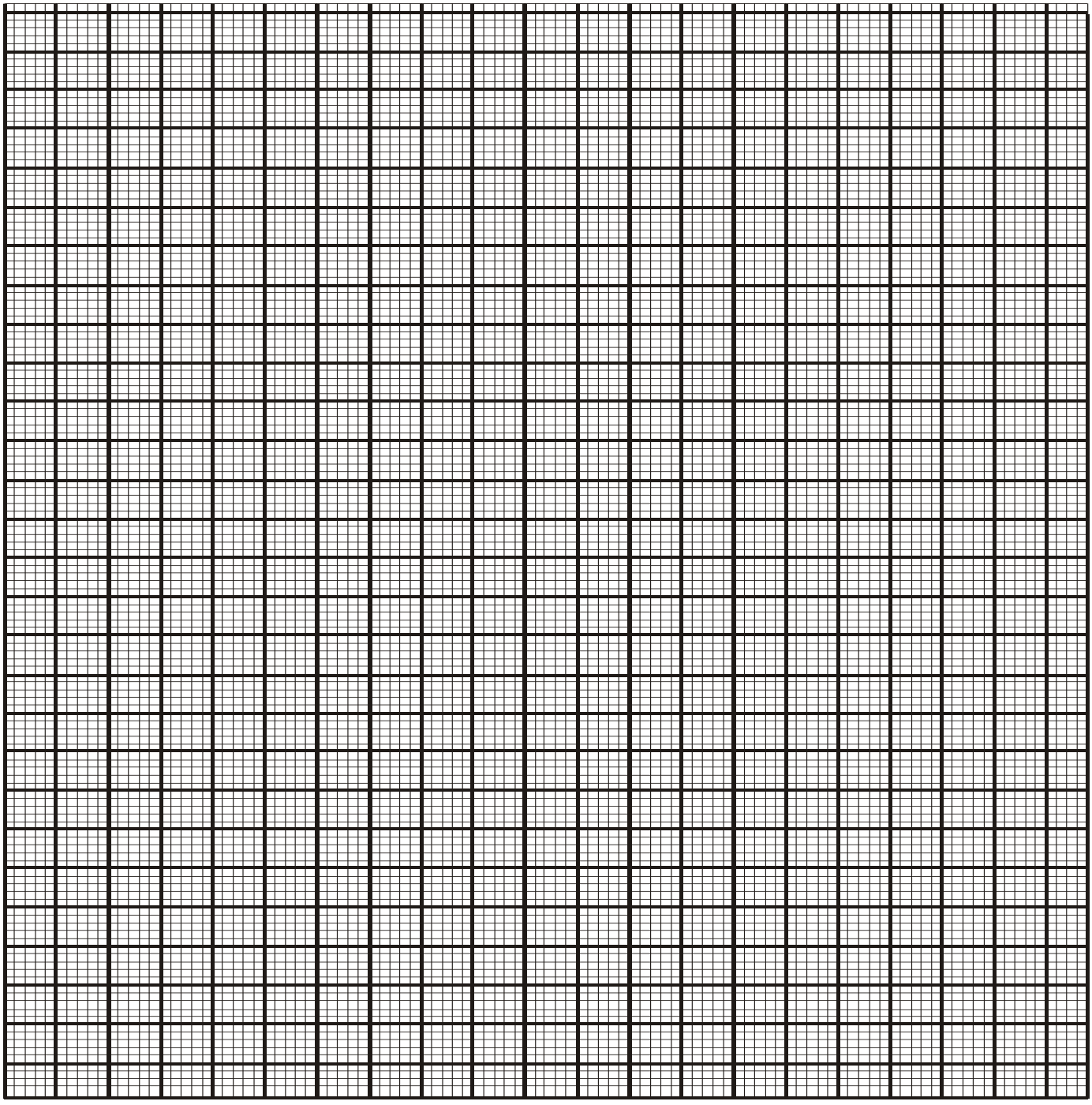
ii) Pull the pendulum bob towards you through a small distance, release it; measure the time (t) of the motion by timing 10 oscillations.

iii) Remove the plasticine at B and slide the loop towards A by 4cm and repeat (ii) above for other distances AB as shown in the table below.

RESULTS (9 marks)

Length from A to B(cm)	80	76	72	68	64	60
Time for 10 oscillations(s)						
Periodic time T(s)						
$T^2(s^2)$						
2θ						
θ						
$\cos\theta$						

f) Plot a graph of T^2 against Cos θ (5 marks)



g) Find the slope S of the graph. (3 marks)

h) Given that $S = \frac{1.6\pi^2}{k}$, find k (3 marks)

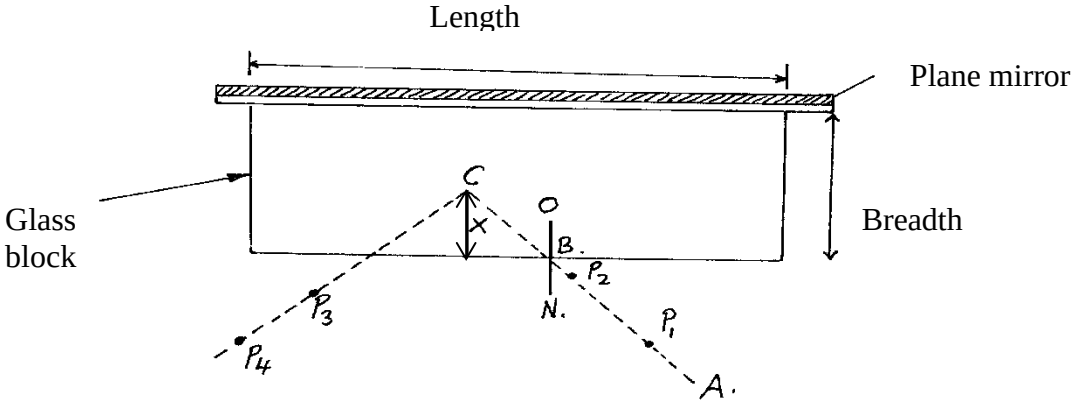
2. PART A

a) You are provided with the following apparatus

- a glass block
- a plane mirror
- 4 optical pins
- a soft board
- A cellotape (about 15cm long)
- 2 white – plain sheets of paper
- a ruler or half metre rule
- a protractor
- 4 office pins

Proceed as follows:-

(i) Using the cello tape provided fix the plane mirror to the glass block alongside as shown in the figure below. The reflecting surface to face the glass block.



(ii) With the use of the office pins, secure firmly a white plain paper on the board and place the block together with attached mirror.

(iii) Draw the outline of the glass block together with the mirror

(iv) Remove the block and the mirror and draw a normal at B somewhere a quarter- way the length of the outline you drew in (iii) above.

(v) Draw four(4) different rays AB incident at B and extended to C. The incident rays should make angles 10°, 20°, 30°,and 40°.

(vi) Replace the glass block together with the attached mirror so as exactly fit the outline in(iii)

(vii) Place two object pins P_1 and P_2 along the 10° line. Locate the images of pinsP_1 and P_2 as they appear by non-parallax (the images of the pins appear to be in a straight line when viewed through the glass block).

Place pins P_3 and P_4 so that the images of pins P_1 and P_2 are not seen.

(viii) Remove the glass block together with the attached mirror from the outline and produce the lines joining P_1 to P_2 and P_3 to P_4 so that the they intersect at C. Measure and record the distance x in the table 2 below. (4 marks)

NB. It may be necessary for you to draw another outline so as to avoid congestion of (construction) lines.

Angle i °	10	20	30	40
Distance x(cm)				

Table 2

(ix) Now measure the breadth b of the glass block.

b=_____(1mark)

(x) Calculate the average A_x of the values of x in table 3 above

A_x _____ (1mark)

(xi) Determine the refractive index of the glass block using the formula.

Refractive index n of glass $n = \frac{b}{A_x}$ (2 marks)

PART B

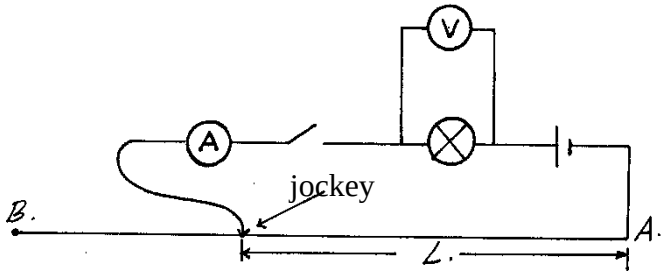
You are provided with the following

- A nichrome wire 1m long mounted on a scale
- A dry cell
- 1 ammeter (0 – 1A)
- A switch
- A bulb
- A voltmeter (0-5v or 0 – 3v)
- A one cell holder
- At least 6 connecting wires, one with a jockey

Proceed as follows

a) (i) Set up the circuit as shown in fig. 2

Fig 2



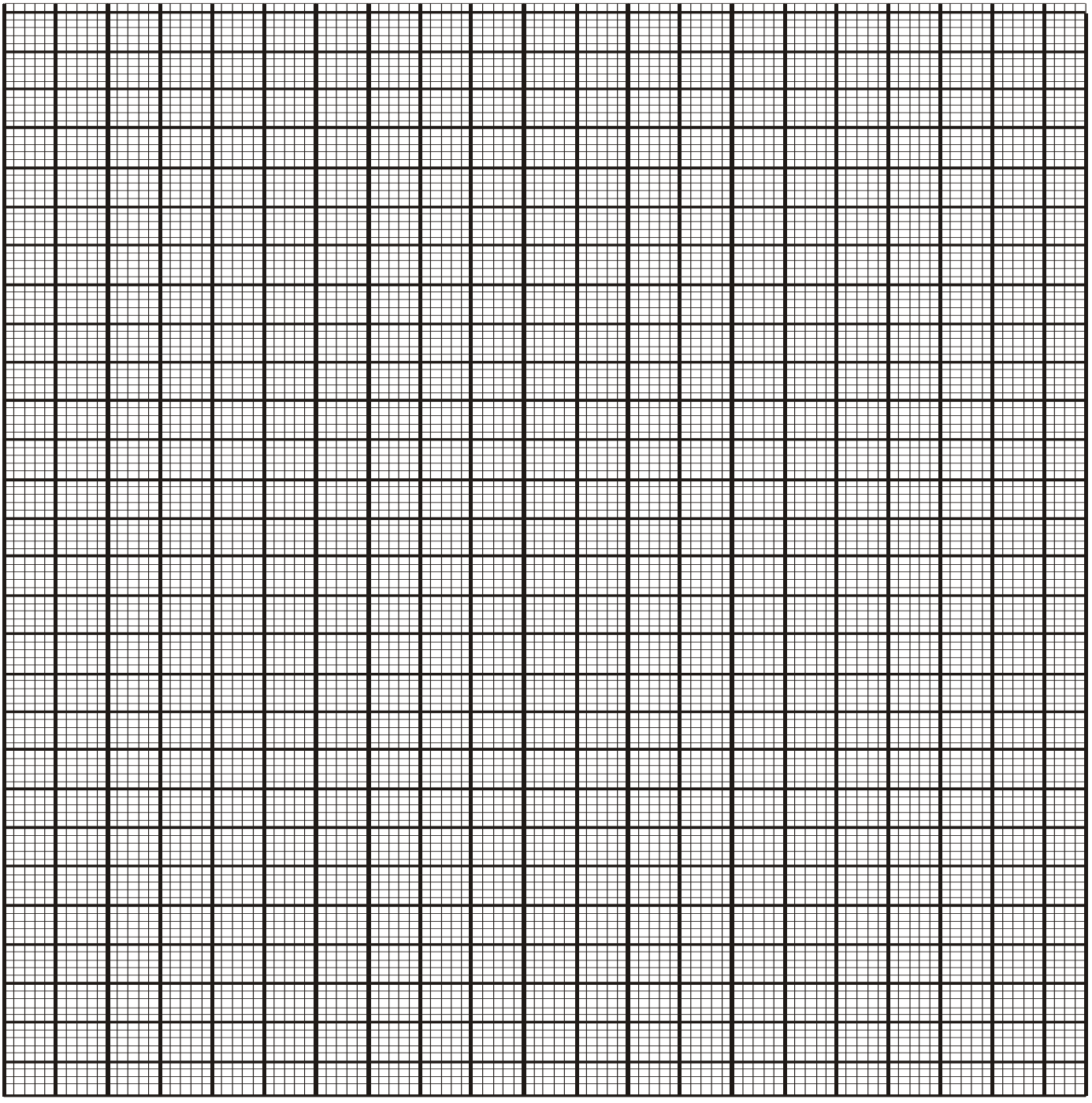
(ii) With the jockey / crocodile clip at B (L=100cm) note the voltmeter reading V and ammeter reading, I and record on the table III below.

(iii) Repeat the procedure in (ii) above for L=80cm, 60cm, 40cm, 20cm and 0cm and record. 5 marks

Table III

L(cm)	100	80	60	40	20	0
V(volts)						
I (A)						

iv) Plot the graph of V(y-axis) against I on the grid provided. 5marks



v) Calculate the slope of your graph when current is 0.15A. 2 marks