Name: ……...…… Index No: …….

Candidate's signature……

Date……

KAKAMEGA NORTH SUBCOUNTY JOINT EXAMINATIONS
KCSE Trial Exam

232/3
PHYSICS (PRACTICAL)
PAPER 3
JULY 2018
2½ Hours

INSTRUCTIONS:
Write your name and index 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 ***2½ 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 their suitability accuracy and the use made of them.
Candidates are advised to record their observations as soon as they are made.
KNEC mathematical tables and non programmable silent calculators may be used.

Q1

	a	b (ii)	c(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	***Total***
Maximum score	½	5	5	3	½	1	2	½	½	2	20
Candidates Score											

Q2

	d (i)	(ii)	(iii)	(iv)	***Total***
Maximum Score	9	5	4	2	20
Candidates score					

Grand Total	

This paper consists of 6 printed Pages

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing

Q1. You are provided with the following apparatus (20 marks)

Requirements.

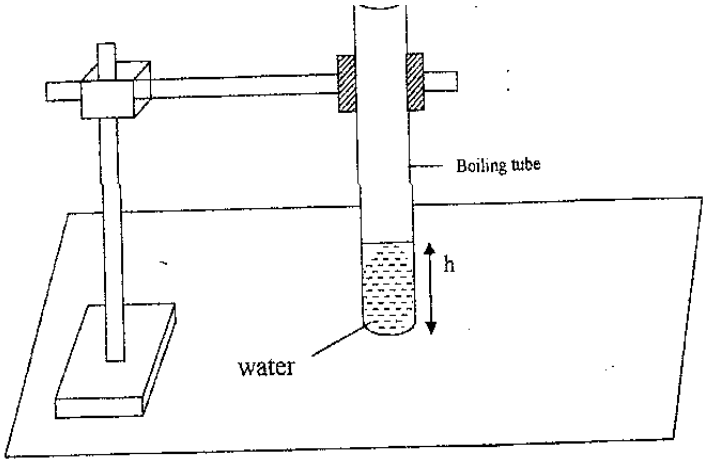
- One boiling tube.
- One 100ml measuring cylinder.
- A piece of string 100cm long.
- A half metre rule.
- One retort stand.
- One boss and a clamp.
- A marble.
- Water source.

Procedure.

a) Read and record the mass m_o of the marble.

M =……g ($^1/_2$mk)

b) i) Clamp the boiling tube vertically with its base resting on the bench. Pour 5cm^3 of water from the measuring cylinder into the boiling tube.

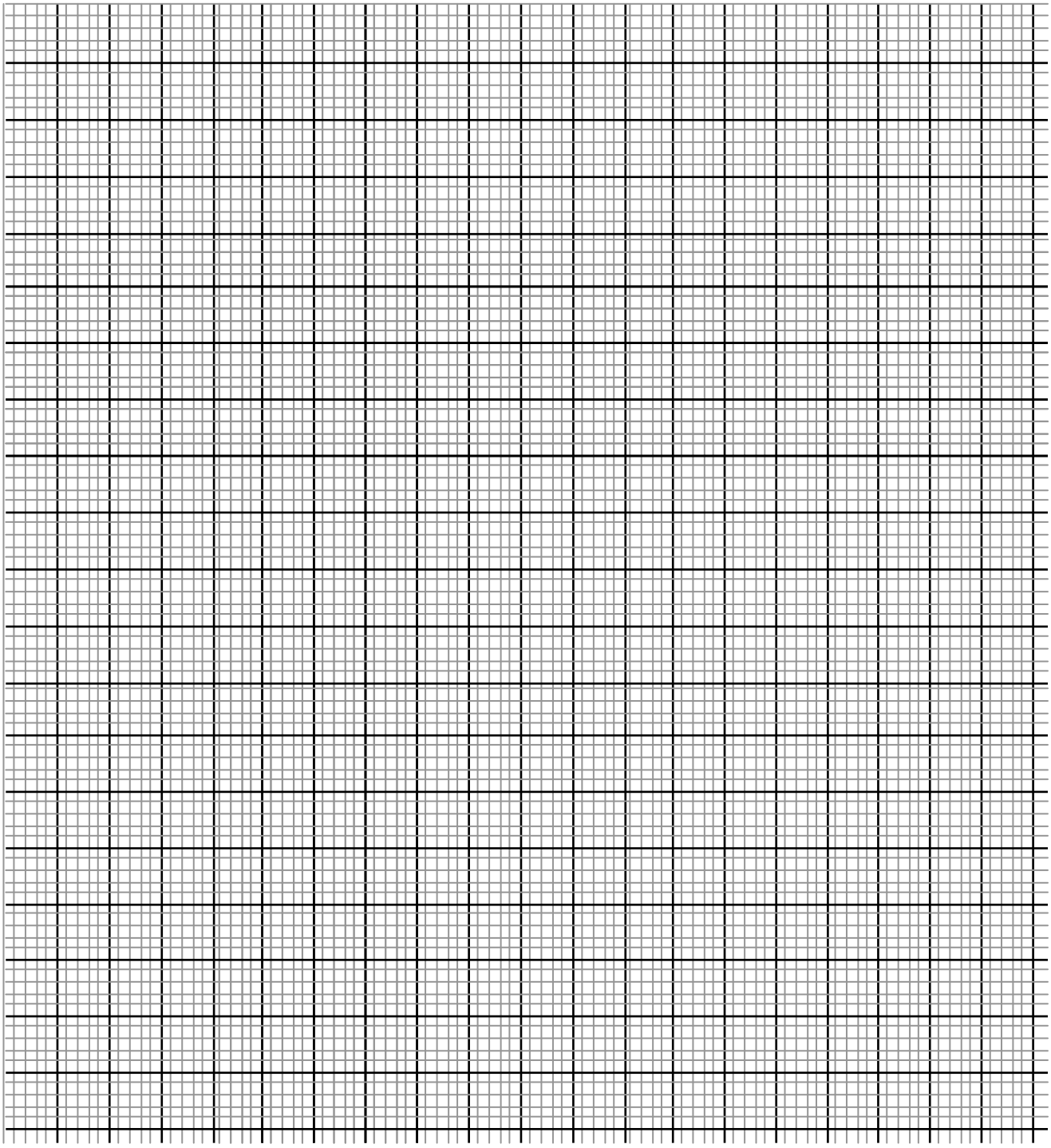


ii) Record the volume V and the length, h, of the water column in the boiling tube in the table below. Repeat the experiment with values of V = 10, 15, 20, 25, 30, 35, 40, 45 and 50cm^3 and complete the table below.

Volume v(cm^3)	Height h (cm)
5	
10	
15	
20	
25	
30	
35	
40	
45	
50	

(5mks)

c i) Plot a graph of volume ***v*** against height ***h*** of water column (5mks)



ii) Determine the slope of the graph and state its units. (3mks)

iii) Measure the length of the boiling tube

H = ……cm ($^1/_2$mk)

iv) Wrap the cotton thread round the boiling tube ten times, measure the length of the thread. (*Ensure that the windings are very close together and do not overlap*)

L = ……..…….m (1mk)

v) Calculate the volume V_b of the glass material of the boiling tube using the formula

$$V_b = H\left(2L^2 - \frac{5}{2500}\right)$$ (2mks)

vi) Empty the boiling tube and pour 50cm^3 of water from the measuring cylinder. Measure and record the height h_1.

h_1 = ……..cm ($^1/_2$mk)

vii) Carefully slide the marble into the boiling tube and record the new height h_2.

h_2 = ……..cm ($^1/_2$mk)

viii) From the graph determine the vol. V_1 and V_2 corresponding to h_1 and h_2 hence determine the density d of the material of the marble given that

$$d = \frac{m}{V_1 - V_2}.$$ (2mks)

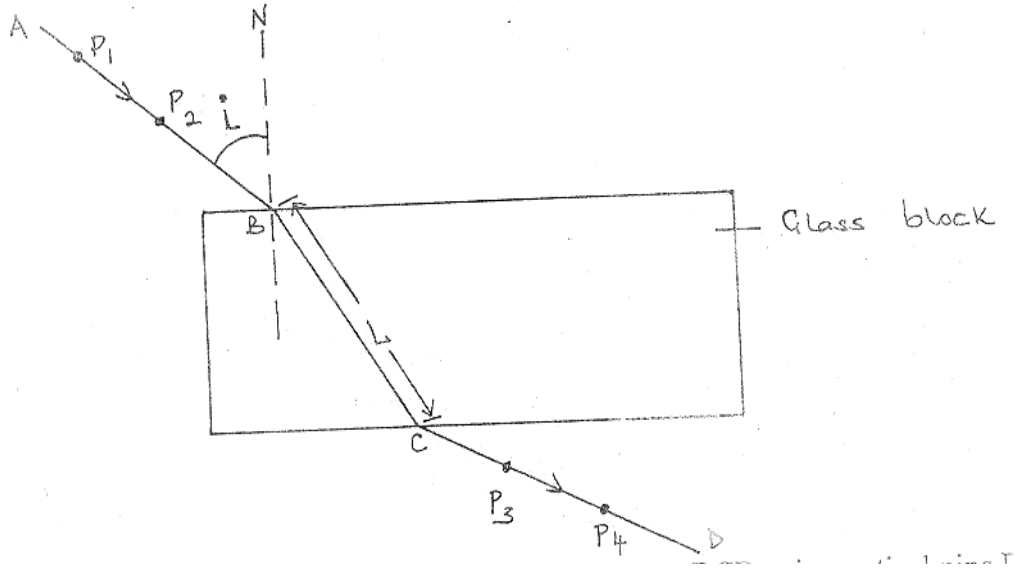
Q2. You are provided with the following:

- A rectangular glass block.
- 4 optical pins.
- A soft board.
- A plain paper.
- 4 thumb tacks.

(a) Fix the plain paper on the soft board. Place the glass block on the plain paper with one of the largest faces uppermost. Trace the glass block using a pencil.

(b) Remove the glass block and construct a normal line at B. Measure an angle of 15^0 from the normal and draw the line AB making this angle. Then fix pins P_1 and P_2 on line AB.

(c) Replace the glass block and fix pins P_3 and P_4 sure that looking through the glass block, all the four pins appear to be in a straight line. Remove the glass block and draw the path of the ray ABCD using a pencil.

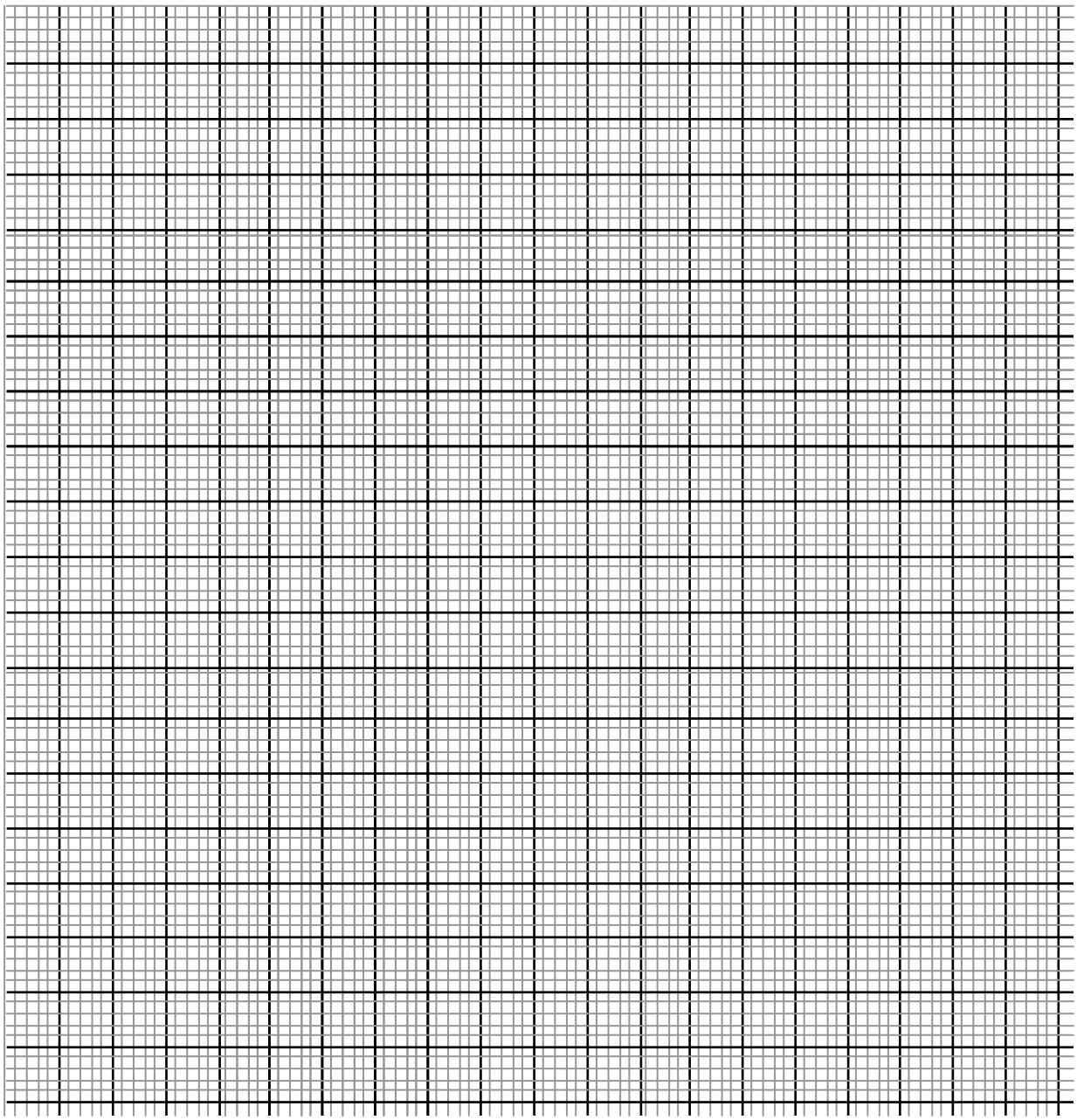


(d) Measure the length L from B to C. Repeat as above for the angles of incidences as shown on the table below. Complete the table.

i°	L(cm)	$L^2(cm^2)$	$^1/_{L^2}$ (cm^{-2})	Sin i	Sin^2 i
15°					
25°					
35°					
45°					
55°					

(9mks)

(ii) Plot a graph of $^{1}/_{L^2}$ (y-axis) against $Sin^2 i$. (5mks)



(iii) Determine the slope and the intercept on the $^{1}/_{L^2}$ axis.

Slope S = (3mks)

Intercept Y = (1mk)

(iv) Given that $S = \frac{Y}{n^2}$ determine the constant n. (2mks)

***NB**: (Fix your rays tracing to your answer booklet).*