NAME _____ CLASS _____ Adm

Candidate's signature _____

ALLIANCE HIGH SCHOOL

TRIAL EXAM

PHYSICS

PAPER 3

2.25 hours

INSTRUCTIONS TO CANDIDATES

(a) Write your name and index class in the spaces provided.

(b) Sign and write the date of examination in spaces provided above.

(c) This paper consists of two questions

For examiner's use only

Question	Maximum score	Candidate's score
1	20	
2	20	
	40	

Question 1

You are provided with the following

Two metre rules

One half metre rule

A pair of vernier calipers

A stop watch or clock

Two retort stands, two bosses and two clamps

Two pieces of thread

Some cello tape

Proceed as follows

a) Measure the thickness, W, of the half metre rule using the vernier calipers provided
W=.....cm .....m 1mk

b) Set up the apparatus as shown in the figure 1 below such that D= 2p = 20cm and q = 20cm

Ensure that D is kept constant throughout the experiment

(Use a piece of cellotape to fix the threads). Ensure also that the loops of thread on half metre rule are made such that the can slide along the rule. This will enable the adjustments of p later in the experiment.)

Note that distance p is measured from the centre of the half metre rule

c) Adjust the position of these loops on the half metre so that p = 21cm.(i.e 2p = 42). You may use a piece of cello tape to keep the loop in position

Measure and record in the table 1 the value of q

N.B q is the vertical distance between the half metre rule and the metre rule

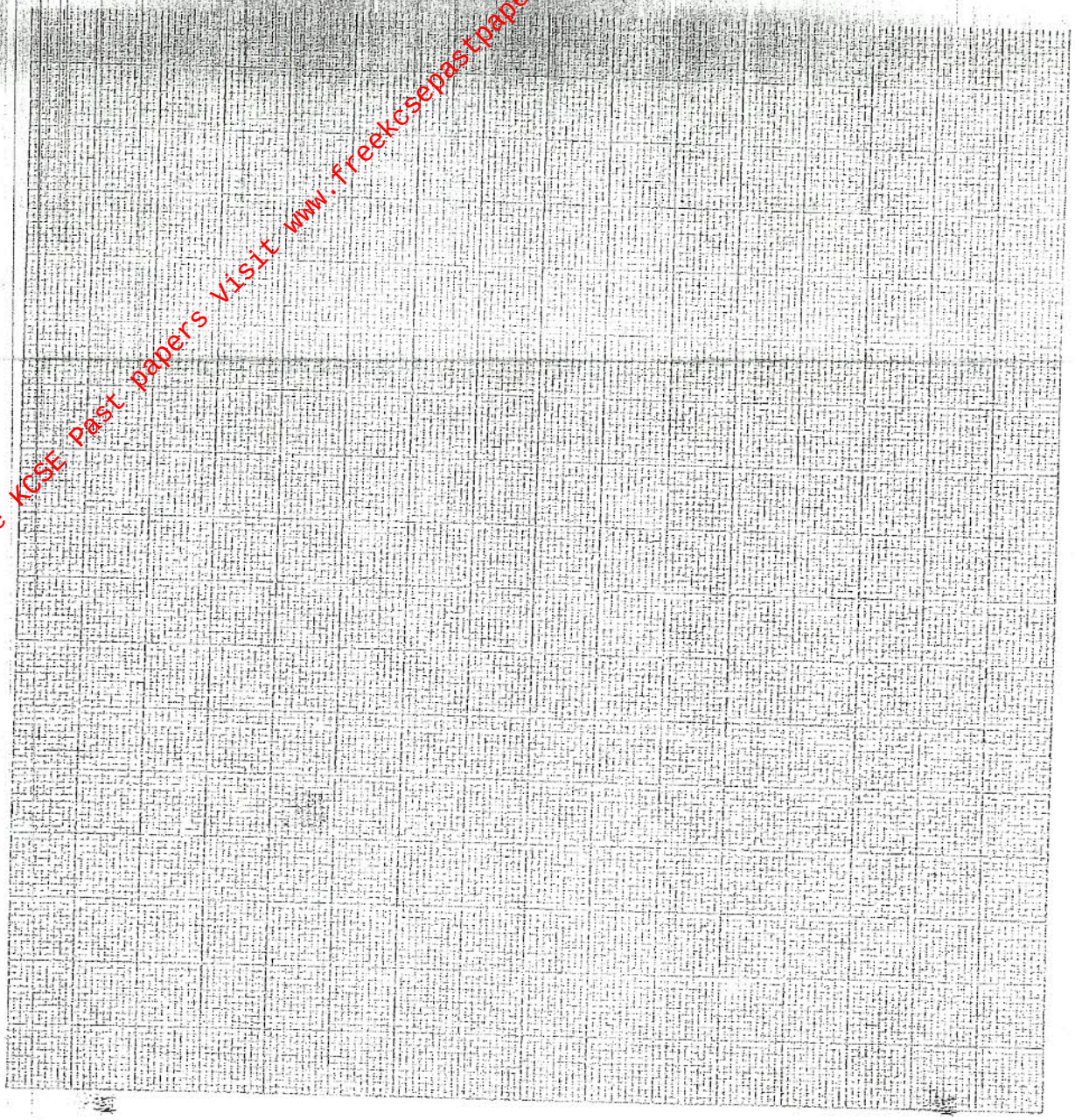
d) Slightly displace one end of the half metre rule towards you and the other away from you in a horizontal plane and release so that it oscillates in the horizontal plane. Measure and record in the table 1 the time t for 10 oscillations

e) Repeat the procedure in (c) and (d) for other values of p shown in table 1

Complete the table 7mks

P (cm)	21.0	19.0	17.0	15.0	13.0	10.0	8.0	6.0	4.0
q (cm)									
Time for t oscillations									
Periodic time T for oscillations									
q/p									

i) Plot the graph of T against $\frac{q}{p}$ 5mks



ii) Determine the slope s of the graph when $^{q}/_{p}$ = 2.0 3mks

g) Determine the constant k for the half metre rule given that $k=\frac{s}{h}\sqrt{Dg}$ where g = 10m/s^2

(2mks)

h) Determine the constant k given $K=\sqrt{\frac{L^2+W^2}{12}}$ where L = 0.5 2mks

Question 2 a

You are provided with the following

A rectangular glass block

Four optical pins

A piece of soft board

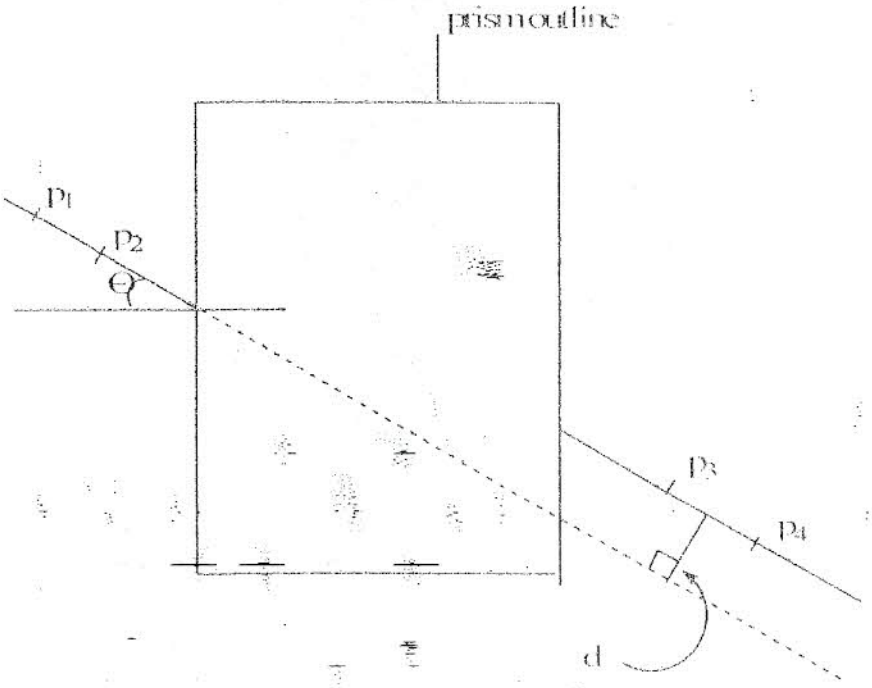
A plain sheet of paper

Cello tape

You are required to have your complete mathematical set

Proceed as follows

a) Place the plain sheet of paper on the soft board and fix it using the cello tape or thumb tucks provided. Place the glass block at the centre of the sheet, and draw its outline. Remove the glass block (see figure 2)



b) Draw a normal at a point 2 cm from the end of one of the longer side of the block outlined. This normal line will be used for the rest of this experiment. Draw a line at an angle Θ=25 from the normal. stick two pins p_1 and p_2 vertically on this line

c) By viewing through the glass from the opposite side stick two other pins p_3 and p_4 vertically such that they are in line with images of the first two pins. Draw a line through the marks made by p_3 and p_4 to touch the outline. Extend the line P1 and P through the outline (dotted).

Measure and record the perpendicular distance between the extended line p3p4 As shown above

Record this value in table 2

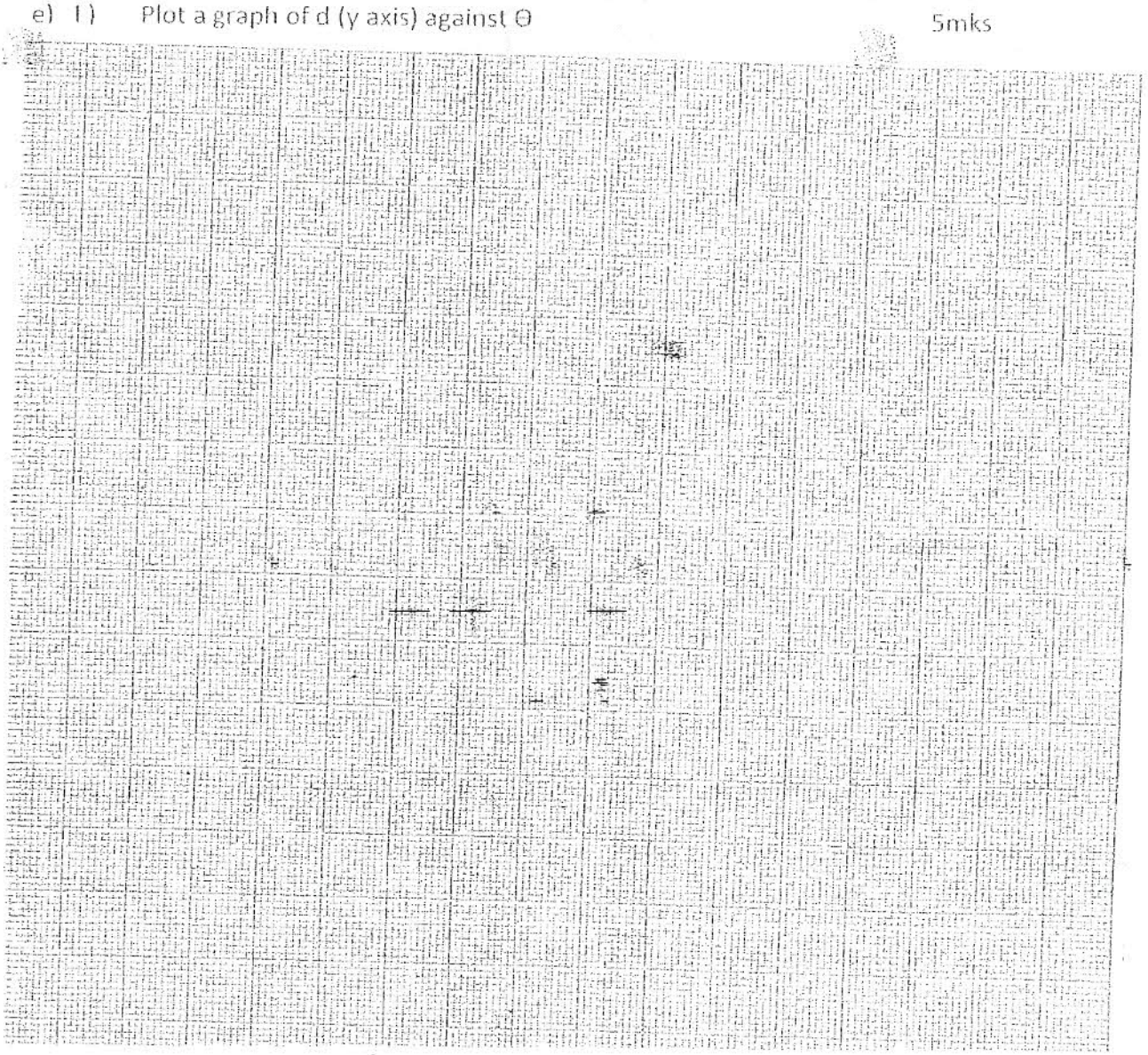
d) Repeat the procedure above and fill in the table below

Table 2

Θ deg	25	35	40	45	55	60	65
D cm							

7mks

e) I) Plot a graph of d (y axis) against Θ 5mks



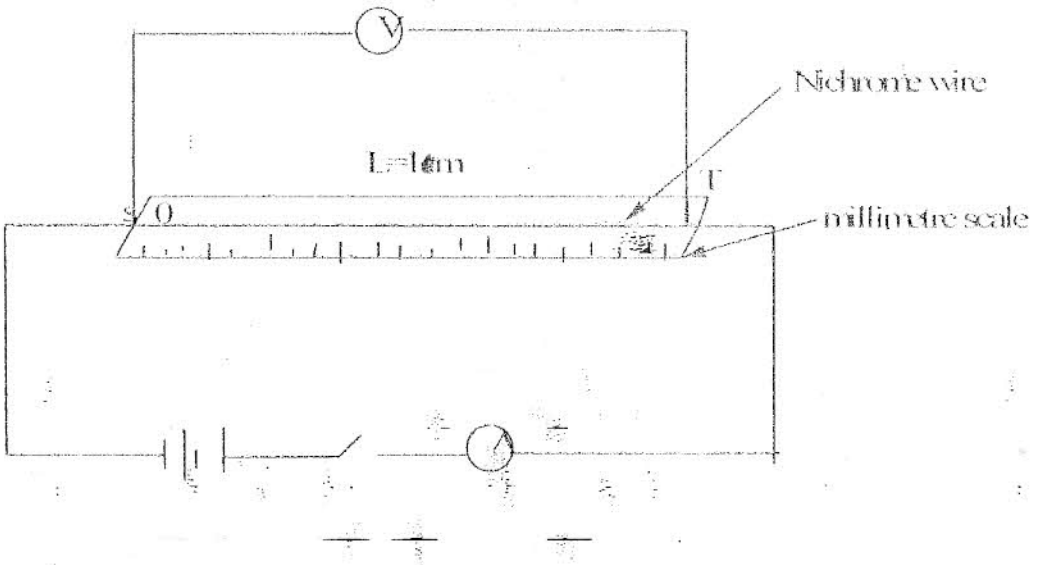
ii) Using the graph, estimate the value of d when $\theta=0^{0}$ 2mks

2 b) You are provided with the following set of apparatus

- A Nichrome wire mounted on a millimeter scale
- 6 connecting wires, 2 with crocodile clips
- An ammeter
- A voltmeter
- A cell holder
- Two dry cells
- A micro meter screw gauge

Proceed as follows:

a) (i) Connect the circuit as shown. The length of the wire ST used to complete the circuit should be exactly 1 metre



(ii) Close the switch and record the current I and the potential difference V across the wire ST. open the switch

I = ... (1mk)

V = ... (1 mk)

(iii) Determine the resistance R_1, given that $R_1 = V/I$ (1 mk)

(iv) Measure the diameter, d, of the ST using a micrometer screw gauge

d = ... mm (1 mk)

(v) Determine the quantity e, of the material of the wire from the relationship $R_1 = \frac{pl1}{A}$

Where A is the cross – sectional area of the wire (2mks)