**NAME………………………………………………….INDEX NO…………………………**

**CANDIDATES’ SIGNATURE………………………DATE……………………………….**

**SCHOOL……………………………………………………………………………………….**

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232/3

Physics

Paper 3

Practical

**INSTRUCTIONS TO CANDIDATES**

* Write your name and index 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 21/2 hours allowed for this paper reading the whole paper carefully before commencing your work.
* Marks are give 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.

**Question 1**

For examiners use only

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M | a | d | e | g | A (ix) | (iii) | (iv) | Total |
| Maximum score | 1 | 6 | 5 | 1 | 1 | 1 | 3 | 20 |
| Candidates score |  |  |  |  |  |  |  |  |

**Question 2**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | a | e | F(i) | (ii) | a | B(i) (ii) (iii) | | | Total |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

1. PART A

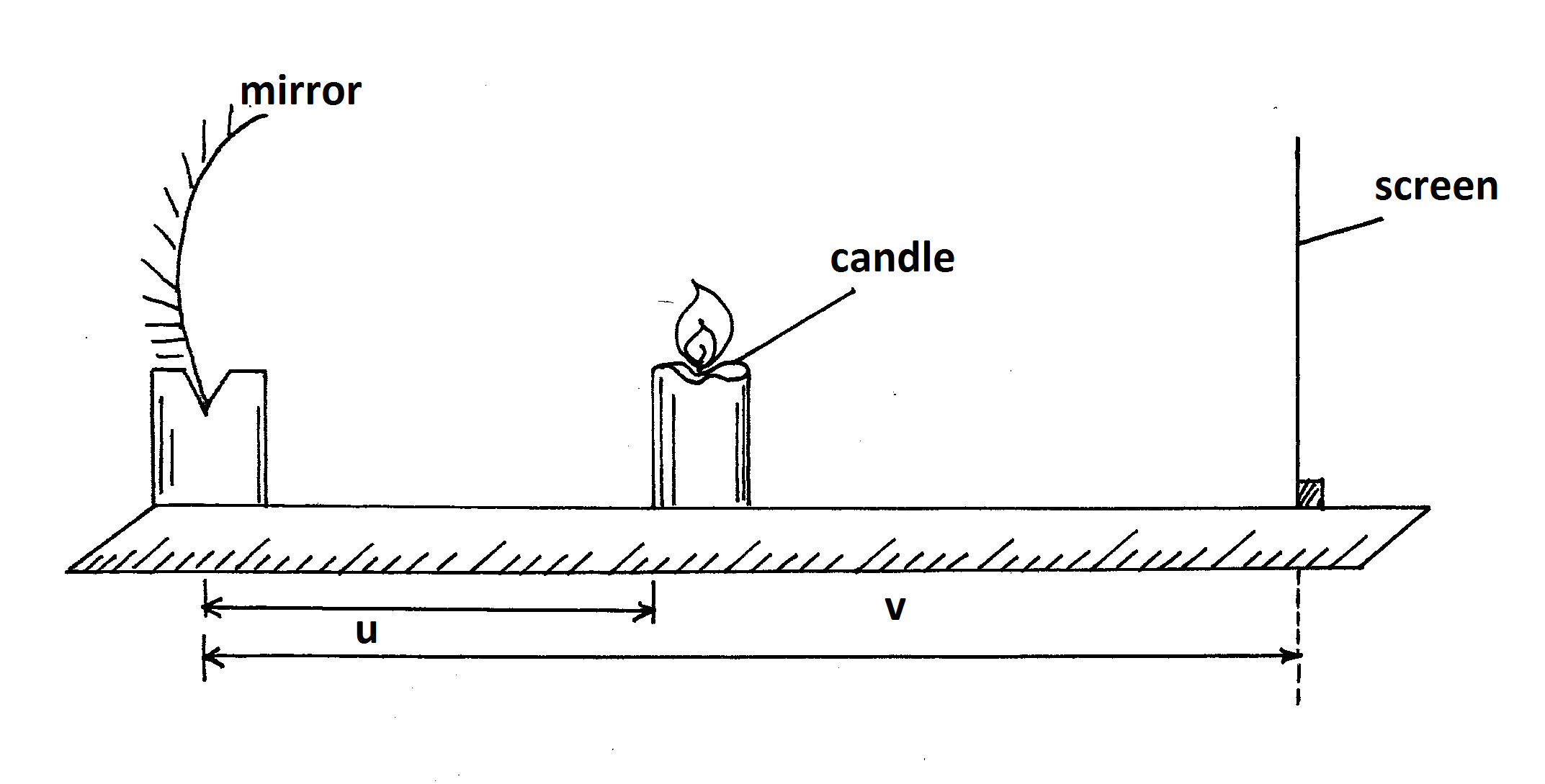
You are provided with the following apparatus

* Concave mirror and a holder
* Meter rule
* Candle ( about 7cm)
* White screen

1. Determine the focal length of the mirror by focusing a distant object

f = ……………………………………………………………………………………(1mk)

1. Arrange the apparatus as shown in figure 1 below

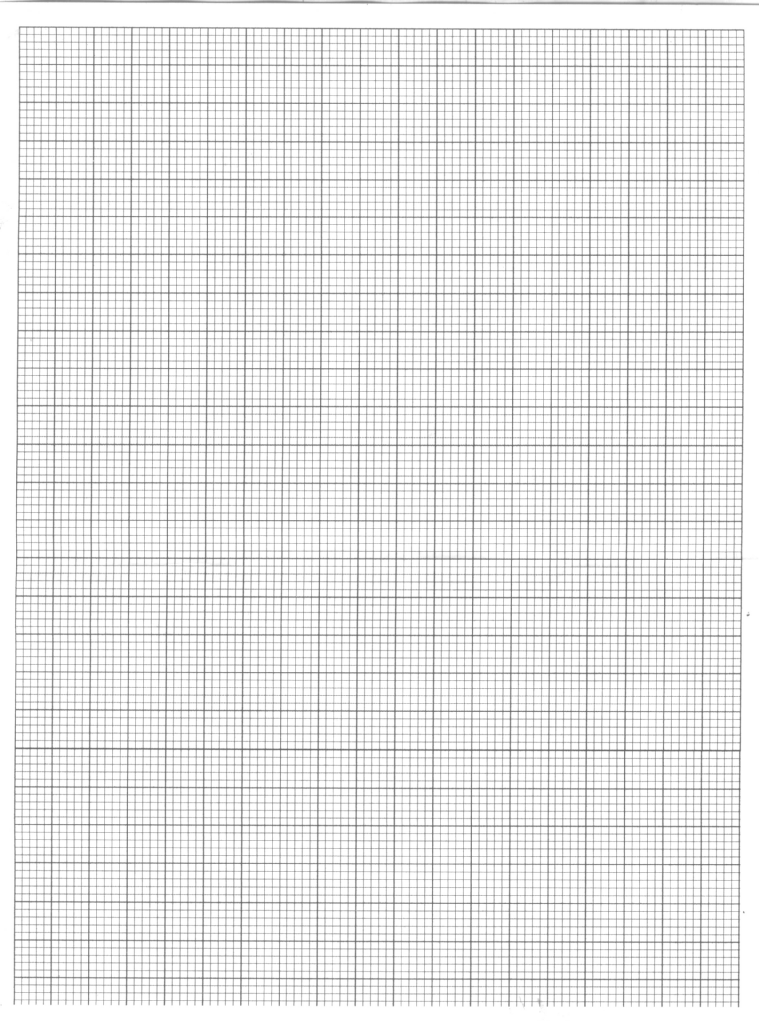


1. Place the candle at a distance u =22cm from the mirror. Move the screen along the meter rule until a sharp image is formed on the screen. Measure and record the image distance V.
2. Repeat the experiments for other values of u and record your result in table 1 below..

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Object distance u(cm) | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| Image distance V ( cm) |  |  |  |  |  |  |  |
| Magnification (v/u) |  |  |  |  |  |  |  |

( 6mks)

1. Plot a graph of magnification , m(y-axis)against image distance v ( 5mks)
2. Given that m = **v/f**-1. Determine the focal length, f.

 (3mks)

**Part B**

You are provided with the following apparatus

* A voltmeter 0-3 or 0-5v
* An ammeter ( 0-1A)
* 10Ω resister ( fixed)
* A switch
* One dry cell and a cell holder
* Six connecting wires

1. (i) Connect the above apparatus as shown in the circuit diagram below with the switch s open.

**S**

**10Ω**

Figure 2

ii) With the switch S open, record E the voltmeter reading (1 mk)

E = ……………………………………………………………………………………….

iii) Close the switch and record V, the voltmeter reading and I the ammeter reading

v = (1mk) ………………………………………………………………………………………..

I =…………………………………………………………………………………………

iv) Given that E –V = Ir, Find r the fro the dry cell. ( 2mks)

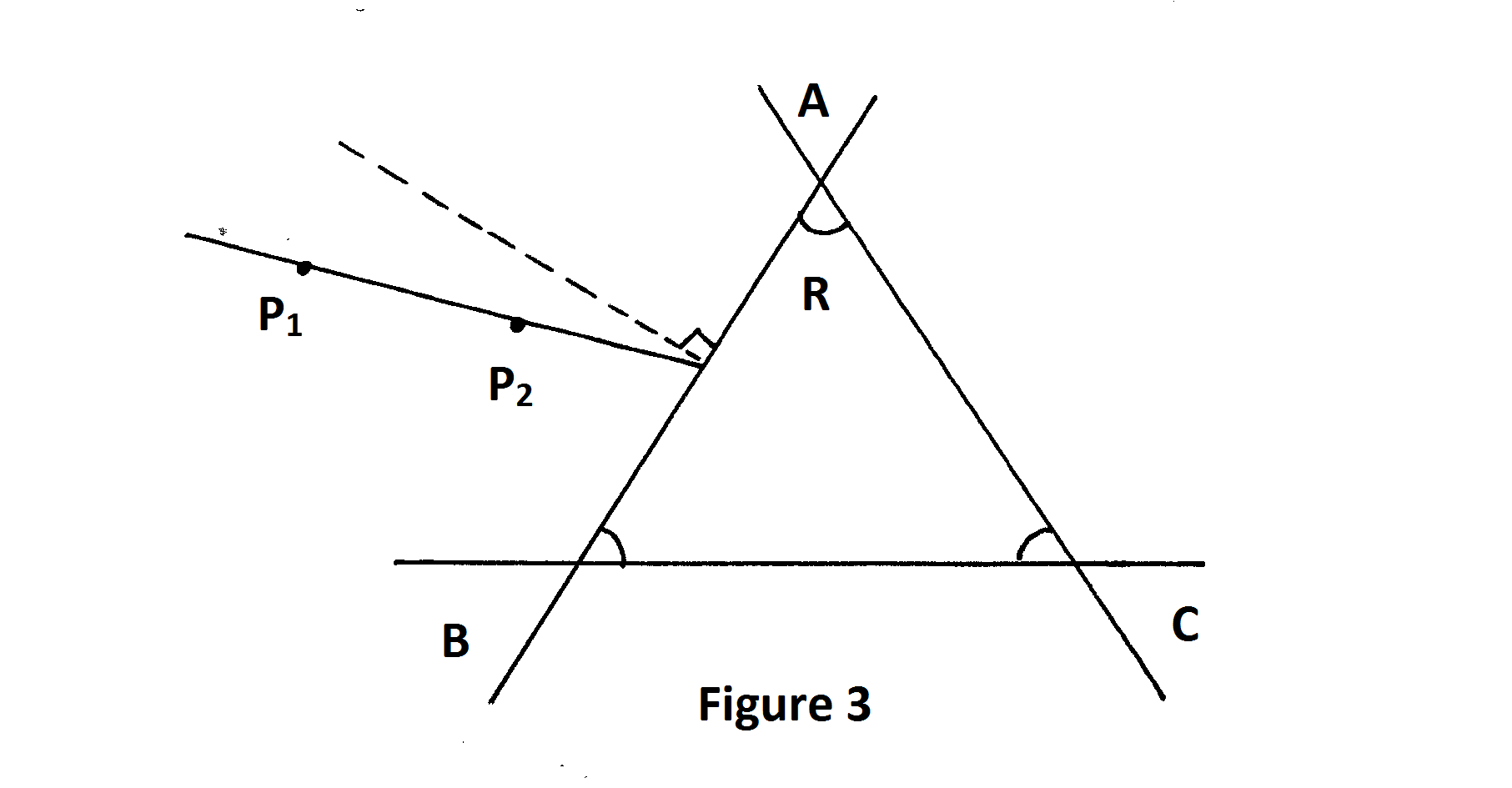
**Question 2**

Part A

You are provided with the folowng

* A triangular prism
* A piece of soft board
* Four ( 4) optical pins
* A sheet of plain paper
* Thumb pins

Proceed as follows:

1. Place the plain sheet of paper on the soft board . Trace the triangular outline of the prism on the sheet of paper. Remove the prism and use a ruler to extend the three sides of the outline

Use a protractor to measure the refracting angle R of the prism.

R =…………………………………………………………………………………………( 1mk)

1. On the side AB of the triangular prism outline,. Draw a normal at a point half-way between A and B. ( This normal will be used for the rest of the experiment).
2. Draw a line at an angle i-300 to the normal. Stick two pins P1 and P2 vertically on this line. See figure 3 above.
3. Place the prism accurately on the outline. By viewing through the prism from side AC. Stick two other pins P3 and P4 vertically such that they are in line with the images of pins P1 and P2

Remove the prism and the pins. Draw a line joining marks made by P3 and P4 . Extending this line to meet AC. See figure 4 below.

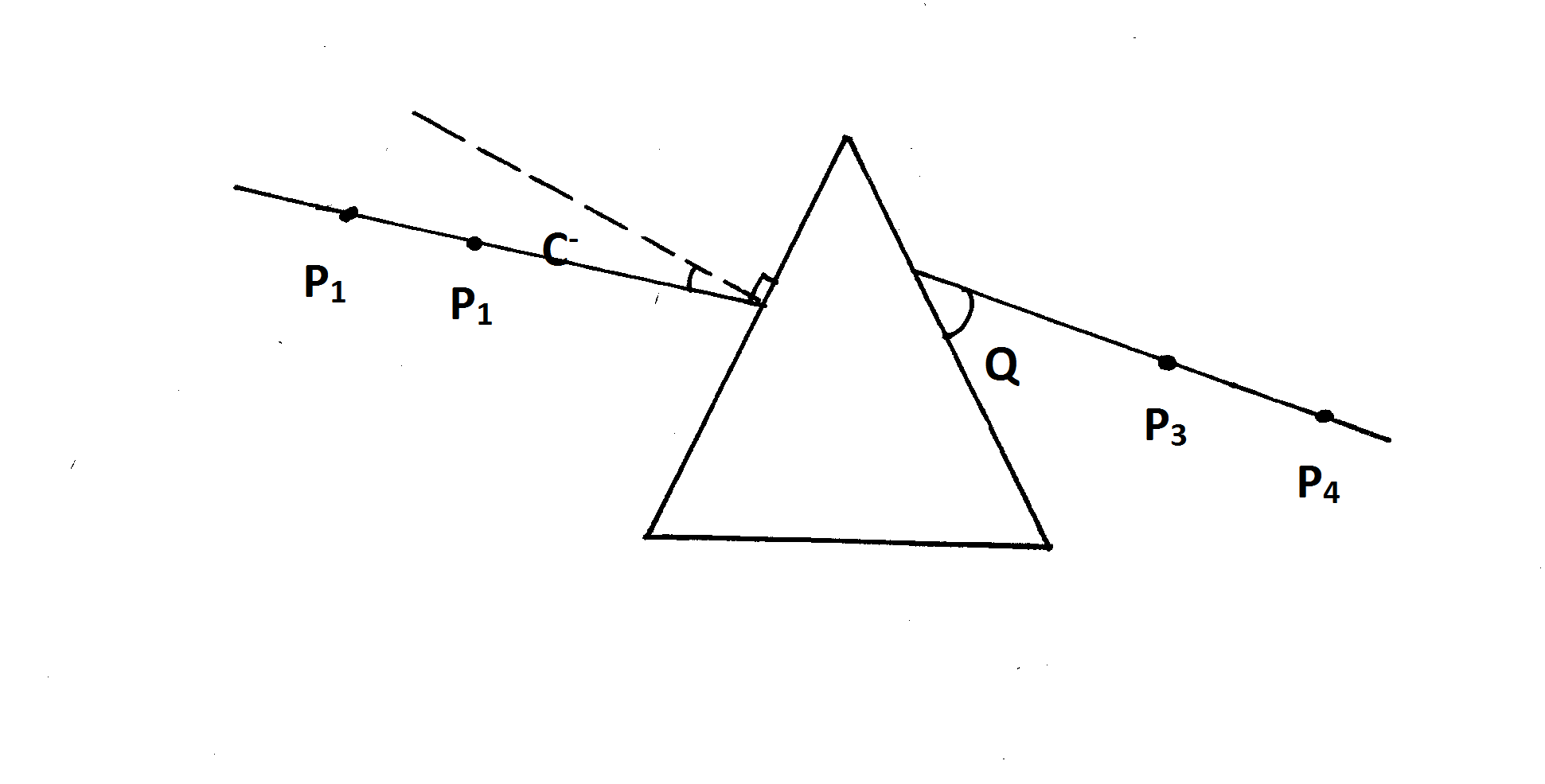
Measure and record in tale 2 below the value of angle o

Figure 4.

1. Repeat the procedures in © and (d) above for other values of I shown in table 2. Complete the table.

Table 2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Angle of incidence i(degree) |  |  |  |  |  |  |  |
| Angle ø ( degree |  |  |  |  |  |  |  |
| Angle f emergence  E =90- ø(deg) |  |  |  |  |  |  |  |

( 6mks)

F) On the grid provided plot the graph of the angle of the emergency E(yaxis) against the Angle of incidence i (5mks)

ii) Use the graph to find i(the angle of incidence at which i=E) ( 1mk)

( The teacher to collect the plane papers used for this experiment showing how the øis got.).

**PART B**

You are provided with the following

* Meter rule
* Report stand, clamp and boss
* 500ml beaker ¾ full of water
* 100g mas
* 50g mass
* Three pieces of thread

Proceed as follows

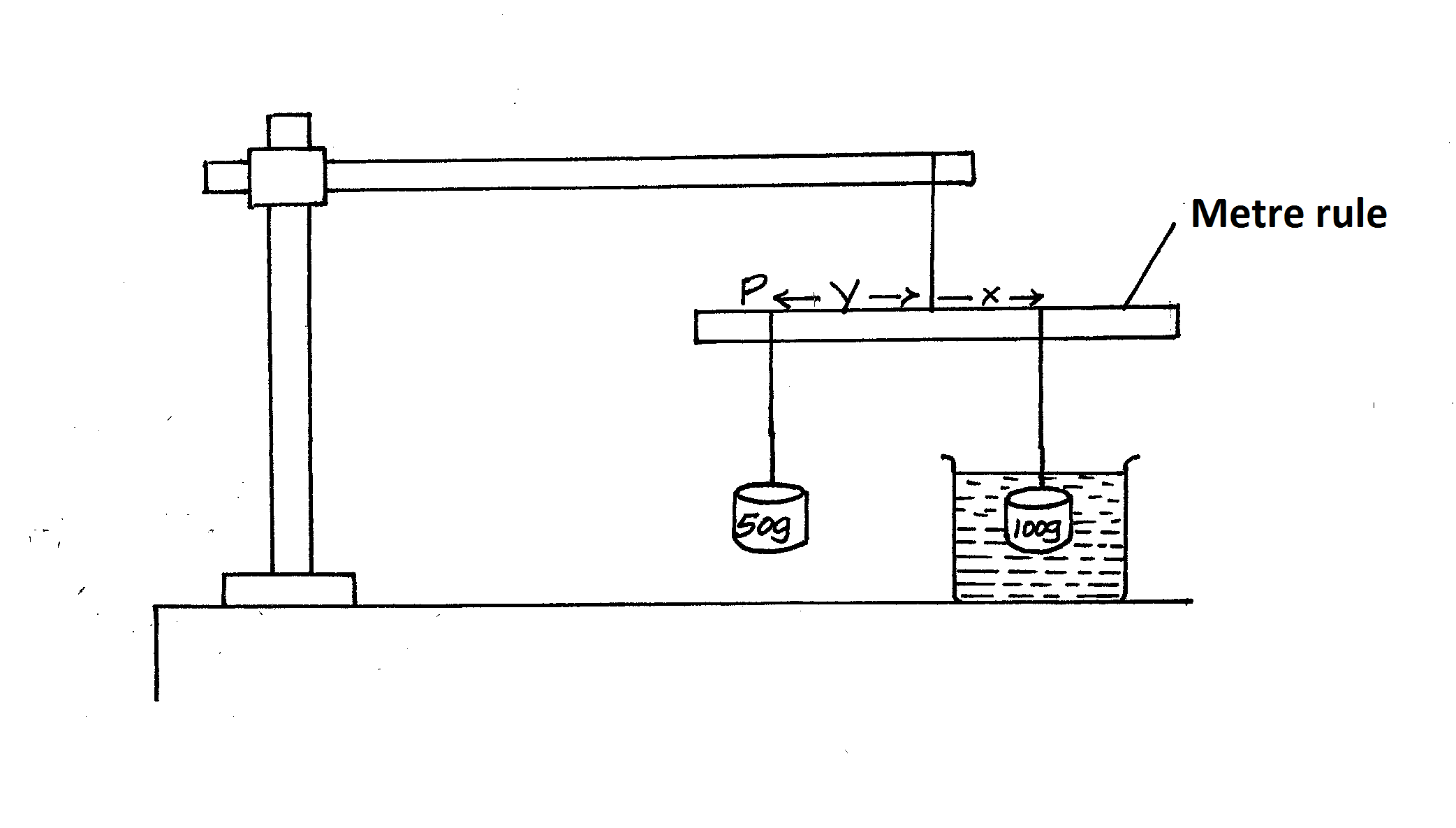
1. Balance the meter rule horizontally by suspending it from the stand and clap with one of the threads . Record the balance point G.

G =…………………………………………………….(cm) ( 1mk)

1. 9i) Suspend the 100g mass from the meter rule at a point x such that x = 10cm from pont G. With l00g mass completely immersed in water in the beaker, hang the 50 g mass from the meter rule and adjust its position until the system is in equilibrium as shown in the diagram below.

Note the point of suspensuion P of the mass ( 50g)

P =……………………………………………………………. ( 1mk)



ii) Find the value of Y.

Y……………………………………………………………………………………..(1mk)

(iii) Using the information above, calculate the up thrust on the 100g mass if the density of water is 1000kg/m3. (3mks)