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

**SCHOOL: ………………………………………………… DATE:…………………………**

**CANDIDATE’S SIGN. ………………………………**

**232/3**

**PHYSICS**

**PAPER 3**

**JULY MOCKS - 2015**

**TIME: 2 ½ HOURS**

***Kenya Certificate of Secondary Education (K.C.S.E.)***

**PHYSICS**

**PAPER 3**

**INSTRUCTIONS TO CANDIDATES:**

* *Write your* ***name*** *and* ***index number*** *in the spaces provided above.*
* *Sign and write the* ***date*** *of the examination in the spaces provided above.*
* *You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the whole paper carefully.*
* *Marks are given for a clear record of the observations actually made, their suitability, accuracy and the use made of them.*

**For Examiner’s Use only:**

|  |  |  |
| --- | --- | --- |
| ***QUESTIONS*** | ***MAXIMUM SCORE*** | *CANDIDATE SCORE* |
| ***1-4*** |  |  |

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

1. You are provided with the following apparatus:-

* A metre rule.
* One stop watch. one stand, clamp and boss.
* One spring.
* Two pieces of wood.
* A beam balance or electronic balance (to be shared)
* One mass labeled M.

**Proceed as follows:**

* + - * 1. Hang the spring vertically by clamping one end as shown in figure 1. (The small pieces of wood to clamp the spring).



* + - * 1. Measure the length, Lo, of the unloaded spring, and record below.

Lo \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mm (½ mk)

* + - * 1. Hang the mass M given from the lower end of the spring. Measure the length, L1 of the loaded spring.

L1 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm (½ mk)

* + - * 1. Find the value of L1 – Lo in centimeters

L = L1 – Lo \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm (1mk)

* + - * 1. Using the balance given, find the mass of the object M.

Mass of M = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g (1mk)

* + - * 1. Hang the mass M from the lower end of the spring. Displace it by a small vertical distance and release so that the spring makes vertical oscillations.

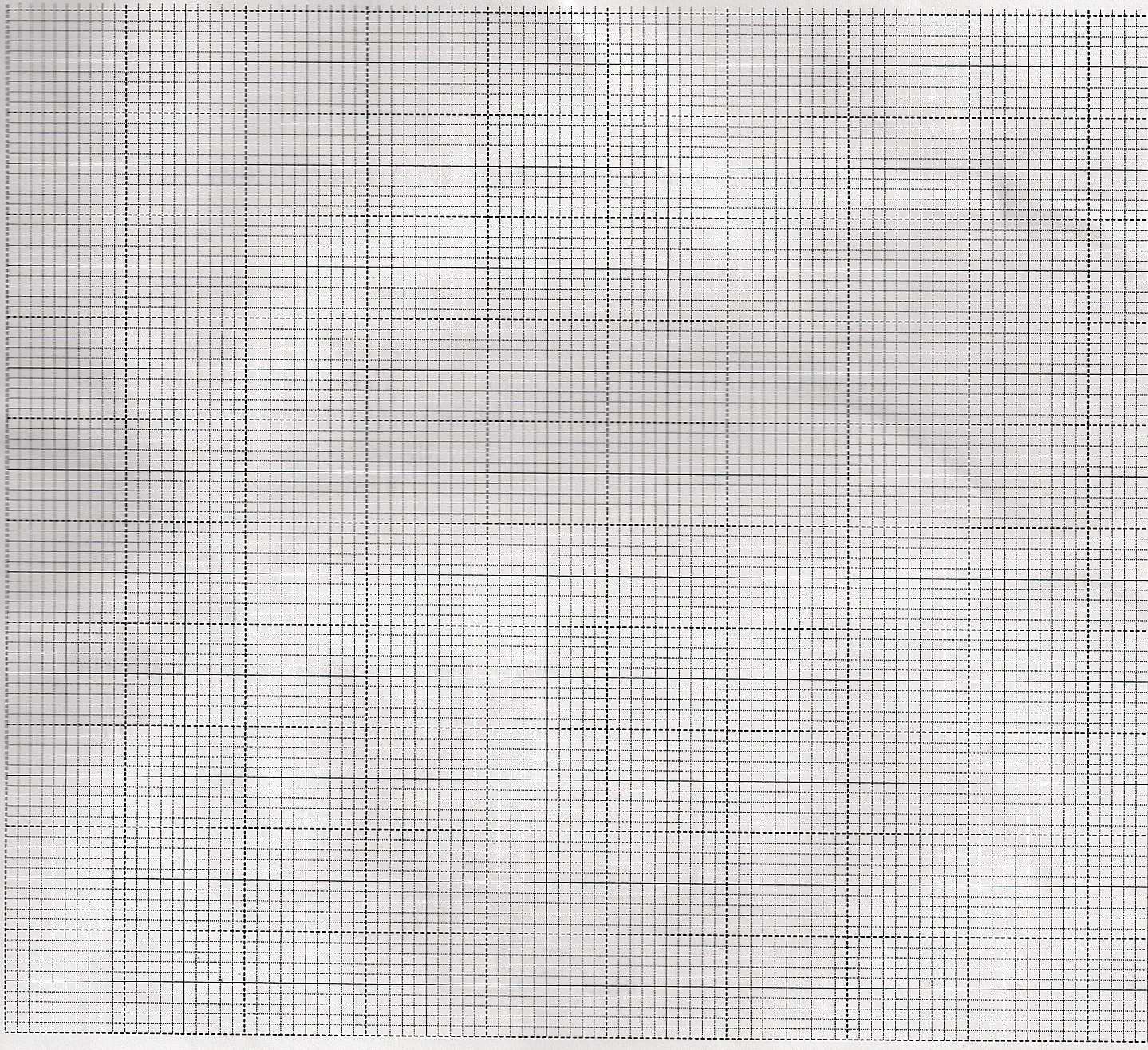
Measure and record, time for the number of oscillations given in the table below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Oscillations, N | 5 | 7 | 10 | 13 | 15 | 18 | 20 |
| Time in seconds, t (s) |  |  |  |  |  |  |  |
| (N + 10t) (s)  10 |  |  |  |  |  |  |  |
| (N + 10t)2 (s2)  19 |  |  |  |  |  |  |  |

Complete the table above. (7mks)

* + - * 1. On the grid provided, plot a graph of N + 10t 2 (y-axis) against N. (5mks)

10



* + - * 1. (i) Determine the slope S, of the graph at N = 16. (3mks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

(ii) Find the constant k, given that:

K = MS (2mks)

13L

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

2. You are provided with the following apparatus

- A boiling tube with a strip of graph paper graduated in centimeters.

- Two 250ml measuring cylinders labelled A and B

- Sand

- Water approximately 250ml

- Liquid L

- A spatula

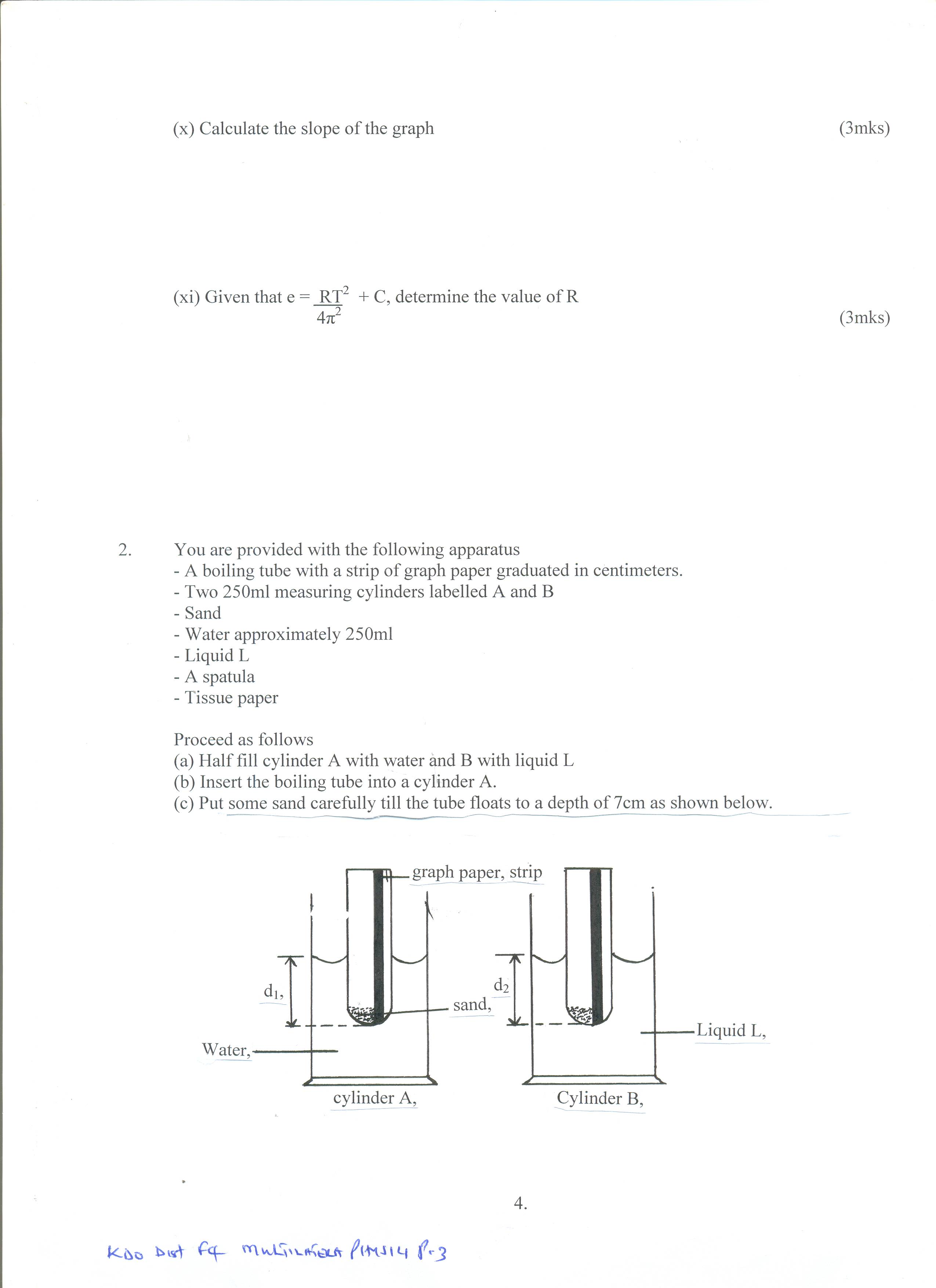
- Tissue paper

**Proceed as follows**

(a) Half fill cylinder A with water and B with liquid L

(b) Insert the boiling tube into a cylinder A.

(c) Put some sand carefully till the tube floats to a depth of 7cm as shown below. Record this depth as d1



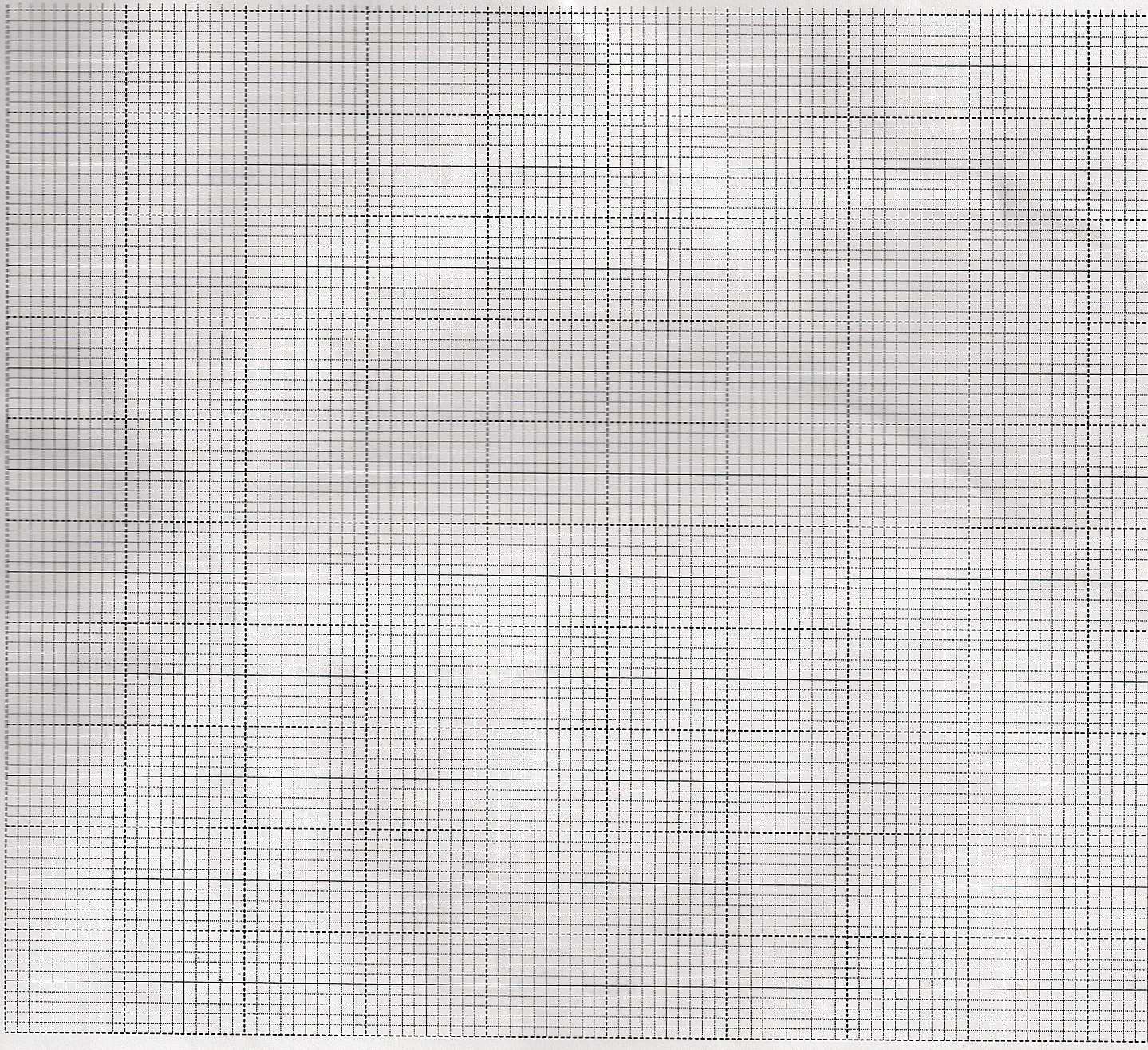
(d) Remove the tube from cylinder A wipe it and then float it in cylinder B. Record the depth to which it floats as d2

(e) Wipe the tube and repeat the above process adding more sand to float the tube upright such that d1 takes other values shown in the table below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Depth in cylinder A d1 (cm) | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10. |
| Depth in cylinder B d2 (cm) |  |  |  |  |  |  |  |

(6mks)

(f) Plot a graph of d1 (y axis) against d2 (5mks)



(g) Determine the slope **S** of the graph (2mks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(h) What does **S** represent? (1mk)

………………………………………………………………………………………………………

(i) Given that the graph obeys, **d1 =  + RL**

a) Determine RL, (1mk)

……………………………………………………………………………………………………………………………………………………………………………………………………………...

(j) Determine the constant r (2mks)

………………………………………………………………………………………………………………………………………………………………………………………………………………

3. You are provided with the following apparatus:

* A voltmeter (0 – 3 or 0 – 5V)
* An ammeter (0 – 1A)
* 10Ω resistor (fixed).
* A switch.
* One dry cell and a cell holder.
* Six connecting wires.

(a) (i) Using the apparatus provided, draw a set-up that can be used to determine the internal resistance of the cell (2mks).

1. With the switch is open record E the voltmeter reading.

E ……………………………………………………………………(1 mark)

1. Close the switch and record V, the voltmeter reading and I, the ammeter reading.

V…………………………………………………………………….(1 mark)

I……………………………………………………………………..(1 mark)

1. Given that: **E – V = Ir**. Find r for the dry cell (2 marks)