**NAME: …………………………………………………….. SCHOOL……………............**

**ADM NO:………………………… DATE:……………….. SIGNATURE………….……**

**232/3**

**PHYSICS**

**(PRACTICAL)**

**PAPER 3**

**FORM FOUR**

**TIME: 2 ½ Hours**

**CATHOLIC DIOCESE OF KAKAMEGA EVALUATION TEST.**

**AUG/SEPT EXAM 2022.**

**Instructions to candidates**

1. Write your **name, index number, school** and **stream** in the spaces provided **above**.
2. Sign and write the date of examination in the spaces provided **above**.
3. Answer **ALL** the questions in the spaces provided in the question paper
4. You are supposed to spend the first **15 minutes** of 2 ½ hours allowed for this paper reading the whole paper carefully before commencing the work.
5. Marks are given for clear record of the observations actually made, their suitability, accuracy and the use made of them.
6. Candidates are advised to record their observations as soon as they are made
7. **Silent non-programmable** electronic calculators may be used.

*For Examiners use only*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Question 1** | (b) | (c) | (d) | (e) | (f) | (h) | (i) | (j) | (k) | Total marks |
| **Max score** | 6 | 2 | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 20 |
| **Candidate’s score** |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Question 2** | (a) | (c) | (d) | (e) | (g) | (h) | (i) | (j) | (k) | (l) | Total marks |
| **Max score** | 1 | 1 | 2 | 1 | 1 | 5 | 5 | 1 | 1 | 2 | 20 |
| **Candidate’s score** |  |  |  |  |  |  |  |  |  |  |  |

**Grand Total**

This paper consists of 7 printed pages. Candidates should check the question paper to ensure that all the pages are printed as indicates and no questions are missing.

**Question 1**

**PART A**

You are provided with the following:

1. Metre rule.
2. Vernier Callipers.
3. 300g mass
4. Two knife edges.
5. Thread

**Proceed as follows:**

(a) Place the metre rule on the knife edges such that each is 5cm from the end.

Ensure the mm scale is facing upwards. Set the distance between the knife edges,

L= 900mm.

(b) Place the vernier callipers vertically against the metre rule at 50cm mark with the

depth gauge lowered to touch the bench.

(i) Record the height ho of the upper edge of the metre rule at the 50cm mark

ho = \_\_\_\_\_\_\_cm \_\_\_\_\_\_\_mm (1mark)

(ii) Using the thread provided hang the 300g mass at 50cm mark of the metre rule ensuring it does not touch the bench. Measure and record the height h of the upper edge of the metre rule from the bench at the 50cm mark.

h = \_\_\_\_\_\_\_cm \_\_\_\_\_\_\_mm (1mark)

(iii) With the 300g mass hanging at the 50cm mark, adjust the position of the knife edges so that the distance L is 600mm with the knife edges equidistant from the 50cm mark i.e. at 20cm from each end.

Measure and record the height h of the upper edge of the metre rule at 50cm mark.

h = \_\_\_\_\_\_\_cm \_\_\_\_\_\_\_mm (1mark)

Table

|  |  |  |
| --- | --- | --- |
| Length L(mm) | 900 | 600 |
| Height h(mm) |  |  |
| Depression, d = (ho-h) (mm) |  |  |
| Log L |  |  |
| Log d |  |  |

(3marks)

(c) Determine the value of (2marks)

(d) Evaluate (1mark)

(e) Given that , determine the value of K. (1mark)

**PART B**

You are provided with the following:

1. A white screen with crosswires
2. A Mounted lens
3. A White screen
4. A Candle
5. A Metre rule

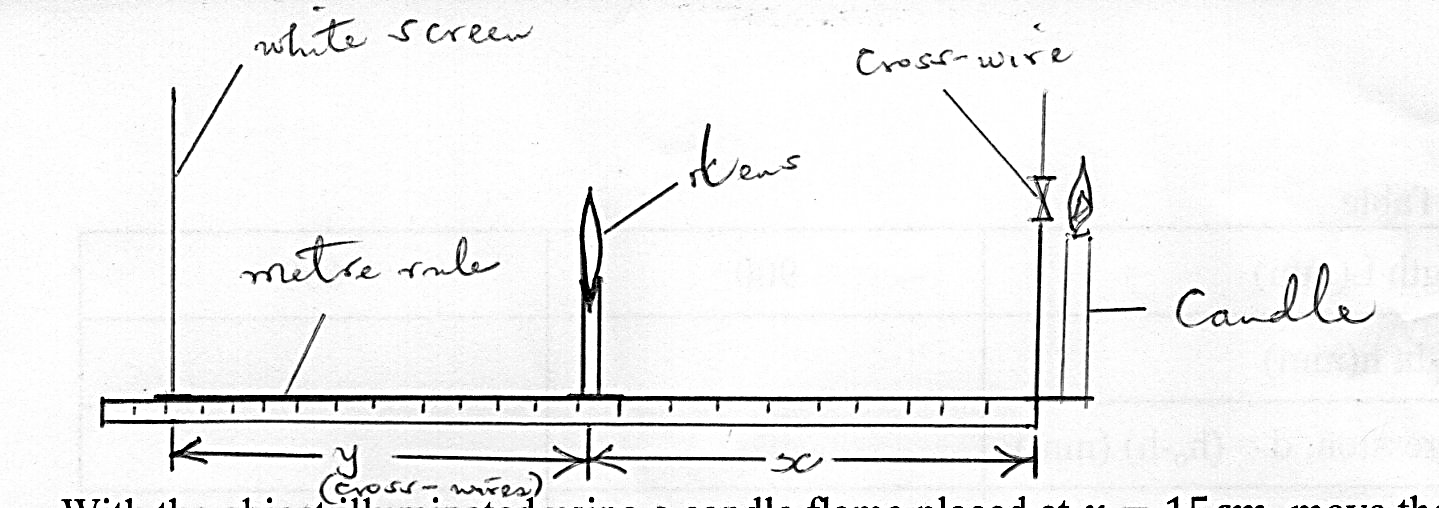
**Proceed as follows:**

(f) Estimate the focal length of the lens by focusing the image of a distant object on

the screen provided e.g. distant window.

fo = \_\_\_\_\_\_\_\_\_\_\_cm (1mark)

(g) Arrange the apparatus as shown.



With the object (cross-wires) illuminated using a candle flame placed at , move the screen until a sharp magnified image of the object is formed on the screen.

Measure and record the corresponding value of y in the table.

(h) Repeat step (g) for the value of

Table (3 marks)

|  |  |  |
| --- | --- | --- |
|  | 15 | 18 |
| ) |  |  |
| (cm-1) |  |  |

(i) Determine the average of (2marks)

(j) Compare the average and (2marks)

(k) Given that (2marks)

**Question 2**

**PART A**

You are provided with the following:

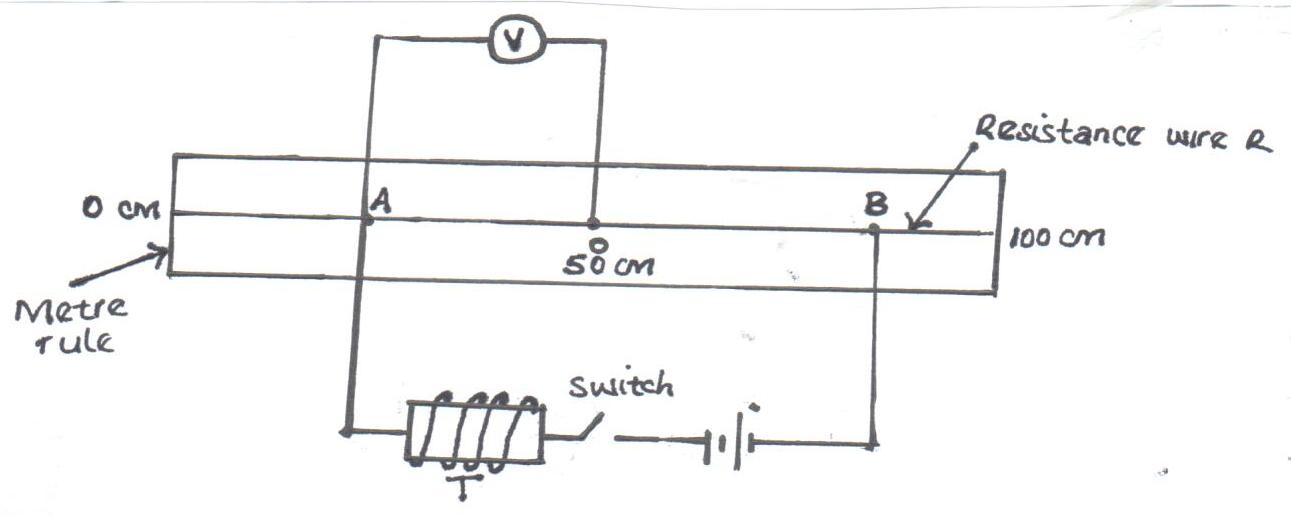
1. A voltmeter
2. A resistance wire labelled R mounted on a metre rule.
3. A metre rule.
4. A resistance wire labelled T mounted on a small piece of carton.
5. Two dry cells and a cell holder.
6. Six connecting wires, each with a crocodile clip at one end.
7. A switch.

**Proceed as follows:**

* + - * 1. Measure and record the e.m.f. E0 of the cells connected in series, E0 = \_\_\_\_ V.

(1mark)

* + - * 1. Connect the circuit as shown below. Point O on the resistance wire R is at 50cm mark of the metre rule. A and B are points on resistance wire R such that AO = OB = x = 30cm.



(c) Close the switch. Read and record the potential difference V across AO

V = …………………………………………. Volts. (1mark)

(d) The relationship between V and x is given by:

1 = 35 + 1

V x y

Determine the value of y. (2marks)

(e) Use the e.m.f. E0 to determine the constant k, given that:

k = 8 (1mark)

35E0

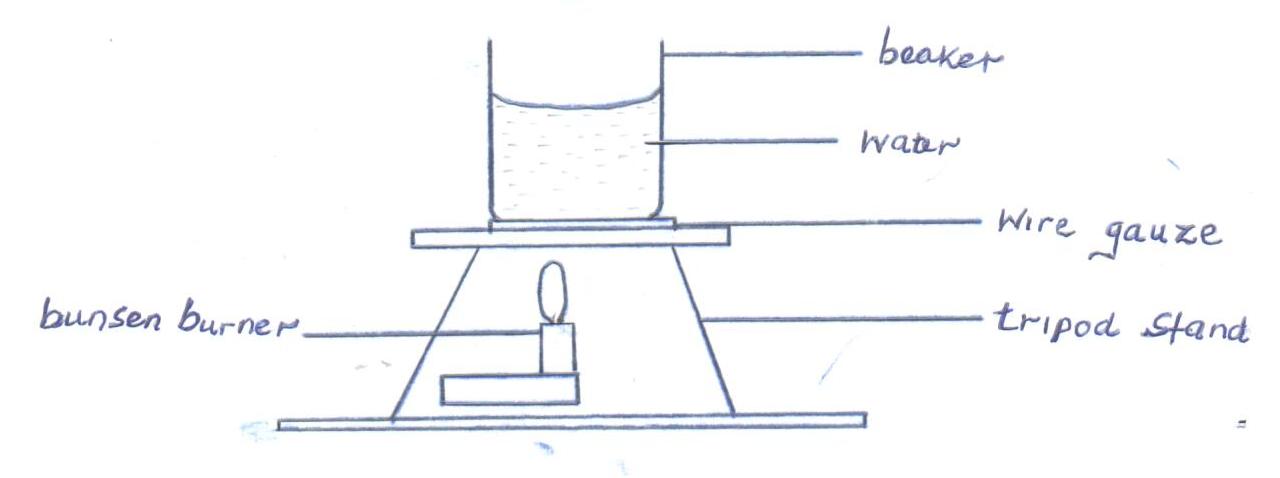
**PART B**

You are provided with the following:-

1. A glass beaker
2. A Bunsen burner
3. A Thermometer
4. A Stop watch
5. A Tripod stand and a Wire gauze
6. A measuring cylinder
7. Water in a container

**Proceed as follows:**

(f) Set the apparatus as shown in the figure.



(g) Measure 100cm3 of water and pour it into the beaker. Take the initial temperature of the water.

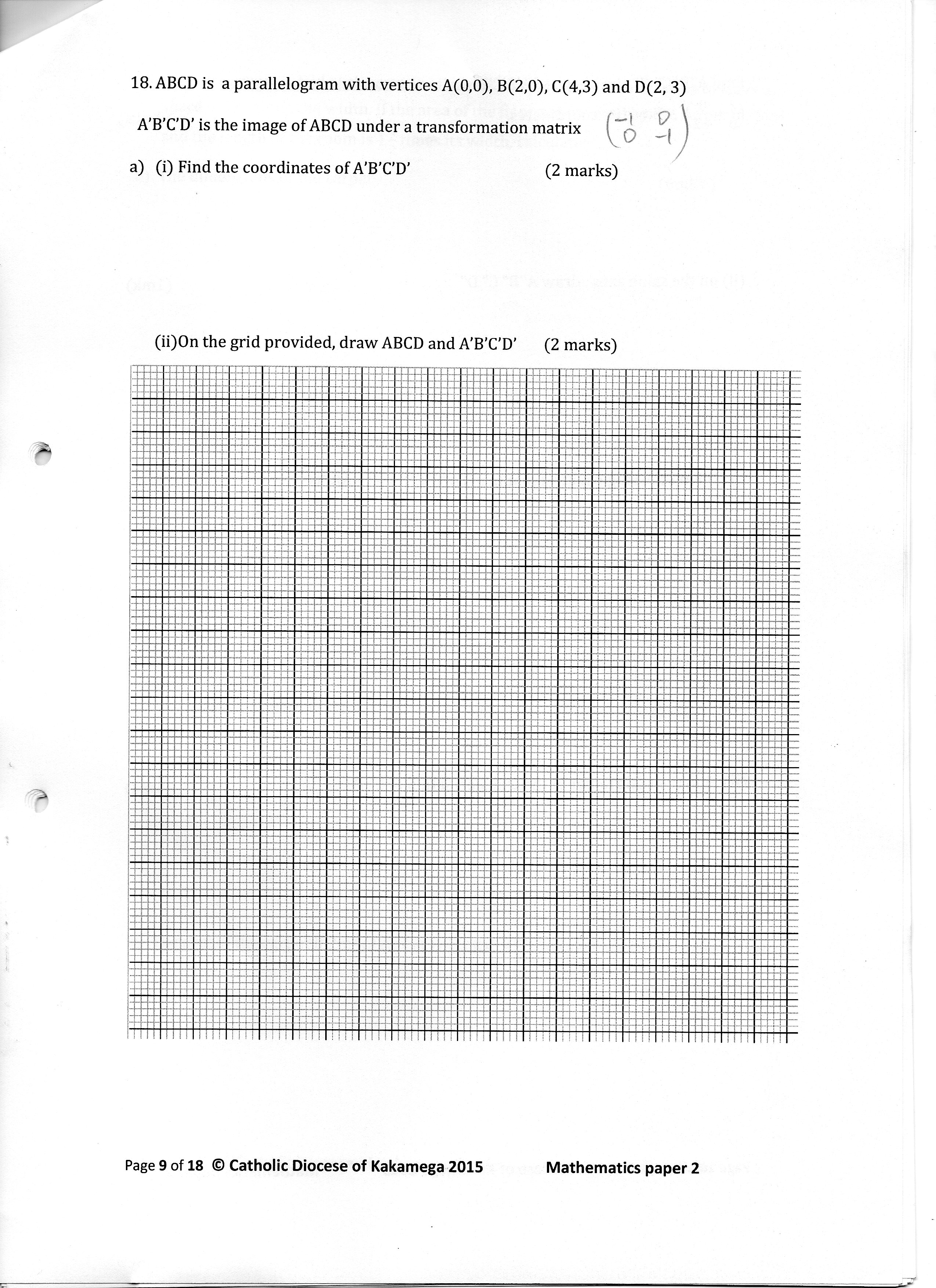
T0 = …………………………………………….0C (1mark)

(h) Now heat the water to a temperature of 800C. Switch off the gas tap and place a thermometer into the beaker and start the stop watch when the temperature is 650C. Take the temperature T (0C) of water after every two minutes. Record your results in the table

**Table** (5marks)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Time, t(min) | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
| Temperature , T ( 0C) |  |  |  |  |  |  |  |
| (T - T0) (0C) |  |  |  |  |  |  |  |
| Log (T - T0) |  |  |  |  |  |  |  |

(i) Plot a graph of Log (T - T0) against Time (t). (5marks)



(j) Determine the value of P (log (T - T0)) when t = 0. (1mark)

(k) Determine N, where N is the antilog of P. (1mark)

(l) Determine the temperature of the surrounding TR using the expression

N = 65–TR (2marks)