Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **May/June 2023**

1 hour

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Any blank pages are indicated.

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1 Some animals live in cold places. They sometimes huddle together as shown in Fig. 1.1.



Fig. 1.1

A student investigated the effect of huddling on heat loss from model animals.

Test-tubes containing hot water represented the animals.

The student used the method described in step 1 to step 10.

Step 1 Place a test-tube in an empty beaker and put a thermometer into the test-tube.

Step 2 Approximately half-fill the test-tube with hot water and start the stop-clock.

Step 3 After one minute record the temperature of the hot water in the test-tube.

Fig. 1.2 is a diagram of part of the thermometer from step 3.

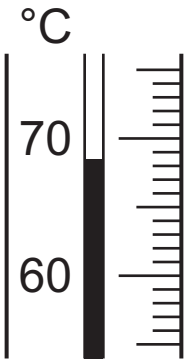

Fig. 1.2

(a) (i) Record the temperature shown in Fig. 1.2.

View solution

..... °C [1]

Step 4 Record the temperature of the hot water in the test-tube every minute for a total of five minutes.

Step 5 Put three identical test-tubes together and keep them in place with an elastic band, as shown in Fig. 1.3. Place the group of three test-tubes in an empty beaker.

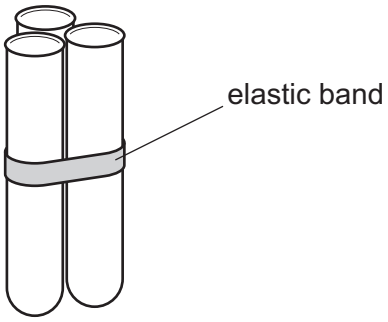

Fig. 1.3

Step 6 Half-fill all three test-tubes with hot water and put a thermometer into one of the test-tubes.

Step 7 Record the temperature in the test-tube at one minute intervals for a total of five minutes.

Step 8 Put seven identical test-tubes together and keep them in place with an elastic band, as shown in Fig. 1.4. Place the group of seven test-tubes in an empty beaker.

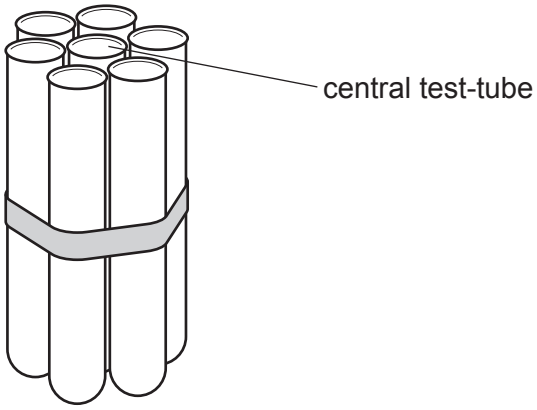

Fig. 1.4

Step 9 Half-fill all seven test-tubes with hot water and put a thermometer into the central test-tube.

Step 10 Record the temperature in the test-tube at one minute intervals for a total of five minutes.

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Fig. 1.5 shows the results the student recorded in their notebook.

one test-tube:	three test-tubes:	seven test-tubes:
1 minute =	1 minute = 67	1 = 73°C
2 = 65	2 = 64	2 = 73
3 = 61	3 = 62	3 = 73
4 = 58	4 = 61	4 = 72
5 = 55	5 = 60	5 = 72

Fig. 1.5

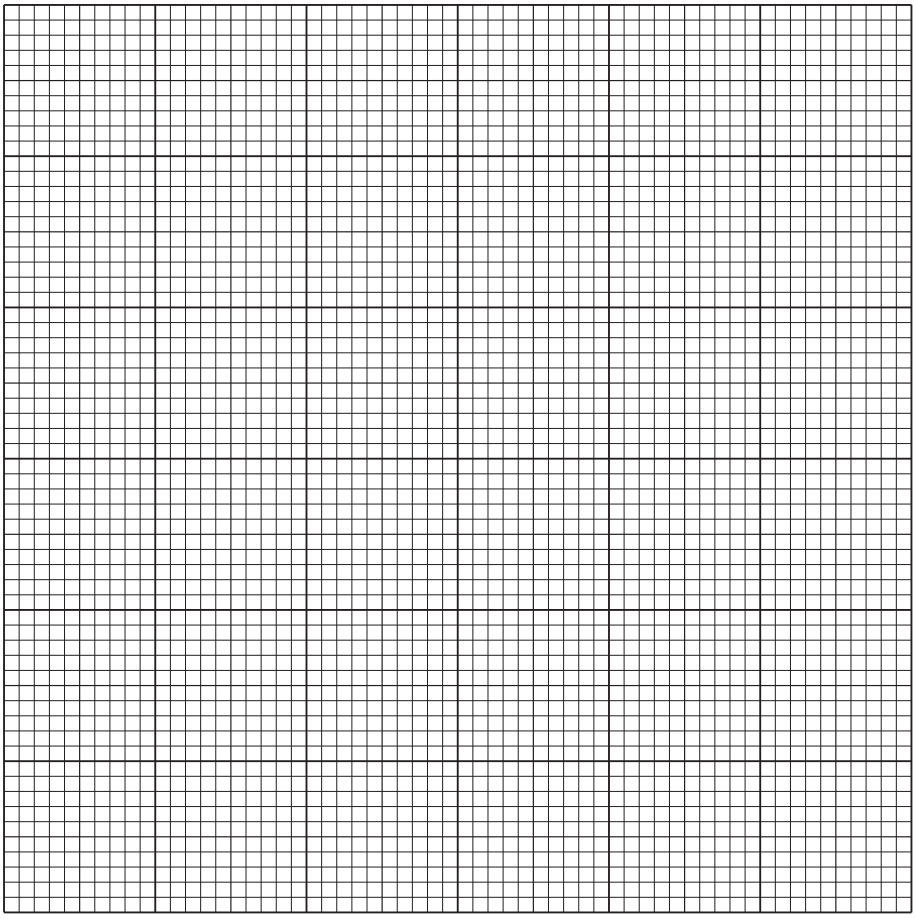
(ii) Prepare a table and record the results shown in Fig. 1.5 and your answer to **1(a)(i)**.

View solution

[3]

(iii) Plot a line graph on the grid of temperature against time. Include all three sets of data from your table in **1(a)(ii)** and a key.

View solution



[5]

(iv) State **two** conclusions for this investigation.

View solution

1 .....

.....

.....

2 .....

.....

.....

[2]

(v) State **two** variables that were kept constant during this investigation.

View solution

1 .....

2 .....

[2]

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(vi) Suggest **two** possible sources of error in this investigation.

View solution

1 .....

.....

2 .....

.....

[2]

(vii) Suggest **one** improvement to the method that was used in this investigation.

View solution

.....

.....

..... [1]

(viii) Identify **one** hazard for this investigation.

View solution

.....

.....

..... [1]

(b) In mammals, respiration releases heat energy to maintain an optimum temperature for enzyme activity in the body.

View solution

Amylase is an enzyme that catalyses the breakdown of starch into reducing sugars.

Plan an investigation to identify the temperature at which the enzyme amylase is most active.

.....

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.....

..... [6]

[Total: 23]

2 **(a)** Some plants lose their leaves in the winter and grow new leaves in the spring.

A scientist measured the total leaf area of the leaves on one grapevine plant. They repeated this on 100 grapevine plants and found the mean total leaf area per plant.

This procedure was done every two months for one year. The results are shown in Fig. 2.1.

View solution

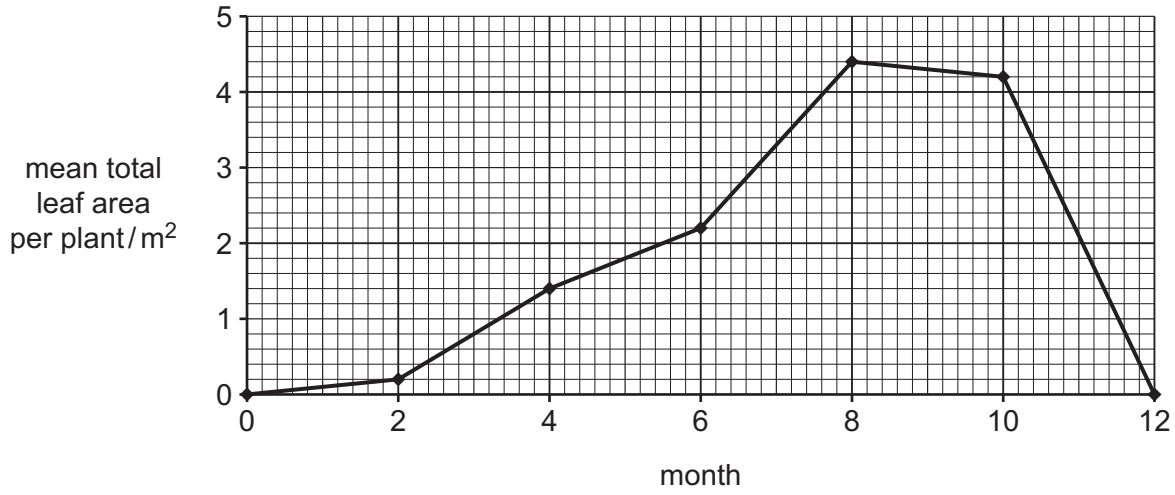

Fig. 2.1

(i) Suggest why a large number of plants were sampled.

.....

.....

..... [1]

(ii) Estimate the mean total leaf area per plant for month 7.

View solution

Show on Fig. 2.1 how you estimated this value.

..... m^2
[2]

(iii) Using the information in Fig. 2.1, calculate the percentage increase in the mean total leaf area per plant from month 4 to month 6.

View solution

Give your answer to **two** significant figures.

Space for working.

..... %
[3]

(b) Fig. 2.2 shows a leaf from a grapevine plant.

View solution

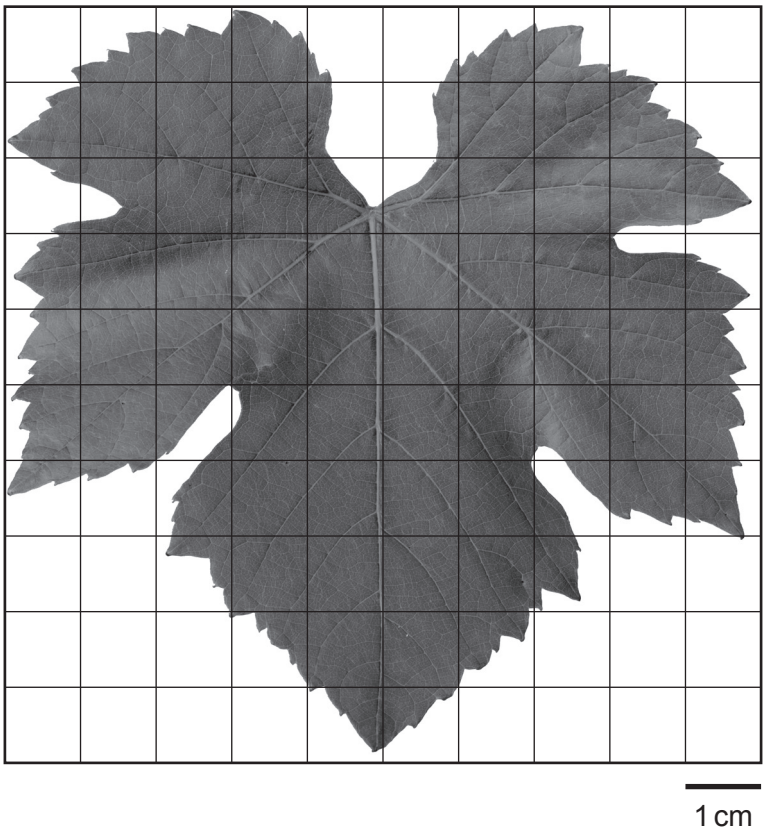

Fig. 2.2

Use the grid to determine the area of the grapevine leaf shown in Fig. 2.2 by counting the squares containing the leaf.

Only count squares that are more than half-filled by the leaf.

Include the unit.

..... [2]

(c) Grapevines produce fruits called grapes. A large leaf area is important when growing grapes because the leaves supply reducing sugars to the grapes.

View solution

Describe the method for testing for reducing sugars. Include the result for a positive test.

method .....

.....

.....

positive test .....

[3]

(d) Fig. 2.3 is a photograph of a leaf from a fig plant.

View solution



Fig. 2.3

Make a large drawing of the leaf in Fig. 2.3.

[4]

(e) State **one** similarity and **one** difference between the grapevine leaf in Fig. 2.2 and the fig leaf in Fig. 2.3.

similarity .....

.....

difference .....

.....

[2]

[Total: 17]

View solution

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