Cambridge
O Level

**Cambridge International Examinations**
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

*5090925666*

**BIOLOGY** **5090/62**

Paper 6 Alternative to Practical **May/June 2018**

**1 hour**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **8** printed pages.


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CAMBRIDGE International Examinations

Answer **all** the questions in the spaces provided.

**1** A student wants to investigate heat loss from the outer surface of the bodies of two animals.

She uses two test-tubes to represent the animals:

a large test-tube with a lower surface area to volume ratio,

a small test-tube with a higher surface area to volume ratio.

- She pours hot water to almost fill each test-tube. Immediately she reads the temperature of the water in each test-tube and records the results.
- She reads and records the temperature of the water in the test-tubes every 2 minutes for the next 10 minutes.
- Her results are shown in the table.

| time / minutes | temperature / °C | |
|---|---|---|
| | large test-tube | small test-tube |
| 0 | 85 | 85 |
| 2 | 77 | 66 |
| 4 | 71 | 51 |
| 6 | 66 | 45 |
| 8 | 61 | 41 |
| 10 | 58 | 38 |

**(a) (i)** State how her results could be made more reliable.

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.....

.....[2]

**(ii)** State and explain **one** safety measure the student should take when carrying out this investigation.

.....

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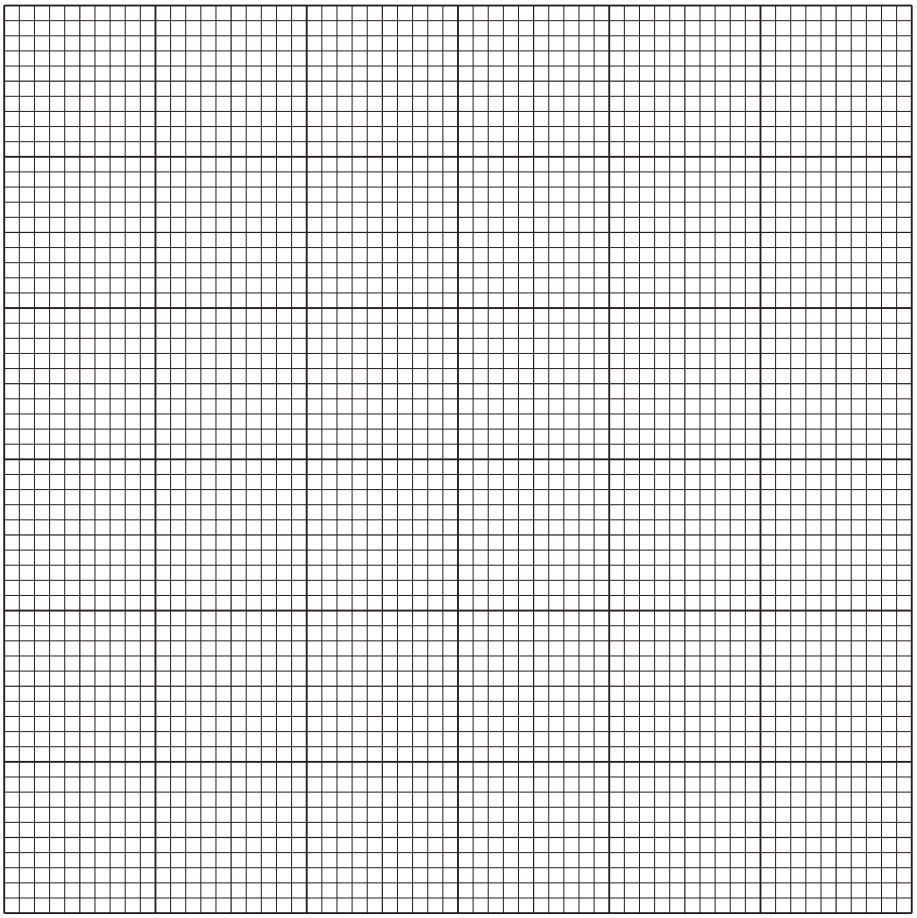
.....

.....[2]

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**(b) (i)** On the grid below and using **one** set of axes, construct a graph with **two** lines to show the relationship between time and temperature of the water in the two test-tubes.

Join your points with ruled, straight lines.



[5]

**(ii)** Use your graph to determine the temperature of the water in the **large** test-tube at 3 minutes.

Show your working on your graph.

.....[2]

**(iii)** Describe what you can conclude about heat loss in large and small animals from the student's results.

.....

.....[1]

**(c)** Penguins are animals that need to maintain a constant body temperature. They can be found living in cold climates near the South Pole as well as in the warmer climate of New Zealand.

Using the results of this investigation, suggest and explain:

**(i)** what difference there may be in the size of the penguins found in these two areas,

size .....

.....

explanation .....

.....

.....

[2]

**(ii)** why penguins stand very close together in groups when external temperatures are very low.

.....

.....

.....

.....[2]

[Total: 16]

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**2** The photograph shows a human tooth.



**(a)** In the space below make a large drawing of this tooth.

[4]

**(b) (i)** Draw a line **on the photograph** to show the maximum length of the tooth.

Measure and record this length. .....

Draw a line **on your drawing** to show the maximum length of the tooth.

Measure and record this length. .....

[3]

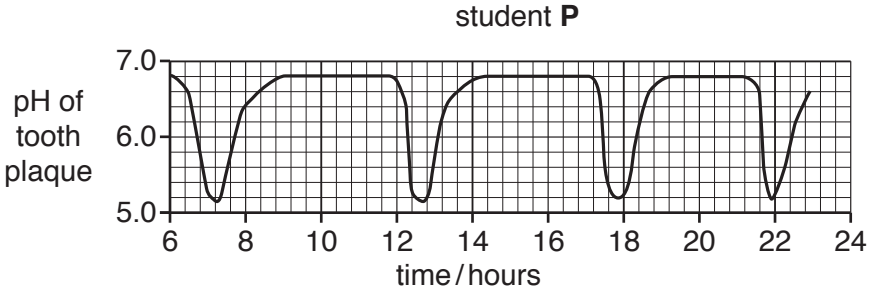
**(ii)** Use your measurements in **(b)(i)** to calculate the magnification of your drawing compared to the tooth in the photograph.

Show your working.

x ..... [2]

**(c)** Plaque is a layer of bacteria which forms on teeth and can cause dental decay.

The pH of the plaque from the teeth of student **P** was measured during a day. The results were plotted on a graph.




**(i)** Suggest how the pH of plaque could be measured safely.

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.....[3]

**(ii)** Suggest and explain why the pH of plaque in the graph is lower at certain times of the day.

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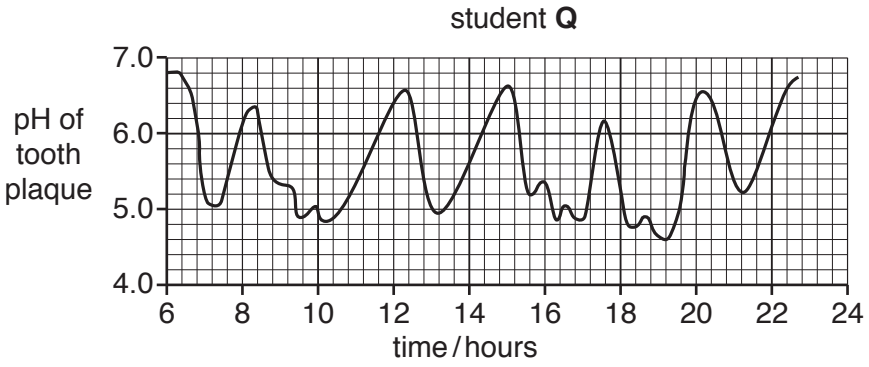
.....

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.....[4]

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The pH of the plaque from the teeth of another student, **Q**, was also measured during a day. The results were plotted on a graph.




**(iii)** Dental decay starts to occur when the pH falls below 5.5. Suggest and explain why student **Q** is more likely to have dental decay than student **P**.

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.....[3]

**(d)** Some people rinse their mouths after eating with a liquid called mouthwash. Manufacturers of mouthwash claim that it helps to reduce dental decay.

Describe how you would investigate whether using mouthwash after eating affects the pH of plaque in a group of 10 students.

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.....[5]

[Total: 24]

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