GradeMax

Cambridge IGCSE

**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

*3409735744*

**BIOLOGY** **0610/52**

Paper 5 Practical Test **February/March 2017**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

**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.

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.

| For Examiner's Use | |
|---|---|
| 1 | |
| 2 | |
| Total | |

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **9** printed pages and **3** blank pages.

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CAMBRIDGE International Examinations

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**1** You are going to investigate the effect of different concentrations of sucrose solution on the movement of water into and out of potato cells by osmosis.

Water enters cells if the solution outside the cells is less concentrated than the solution inside the cells.

Water exits cells if the solution outside the cells is more concentrated than the solution inside the cells.

You are provided with four potato sticks, which have been cut to the same length.

**Read all the instructions but DO NOT CARRY THEM OUT until you have drawn a table for your results in the space provided in (a)(ii).**

Step 1 Measure each of the potato sticks. Record the results in your table in **(a)(ii)**.

Step 2 Place one potato stick into each of the solutions in the large test-tubes labelled **A**, **B**, **C** and **D**.

Immediately observe what happens to each of the potato sticks.

**(a) (i)** Record your observations

Potato stick in solution **A** .....

Potato stick in solution **B** .....

Potato stick in solution **C** .....

Potato stick in solution **D** .....

[1]

Step 3 Leave the potato sticks for **30** minutes. While you are waiting continue with the other questions.

Step 4 Use a marker pen to divide the white tile into four sections and label them **A**, **B**, **C** and **D**.

Step 5 After 30 minutes pour the contents of the large test-tube **A** into the beaker labelled waste. Place the potato stick on to the white tile in the section labelled **A**.

Step 6 Measure the length of the potato stick and record the results in your table in **(a)(ii)**.

Step 7 Repeat steps 5 and 6 for large test-tube **B.**

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Step 8 Repeat steps 5 and 6 for large test-tube **C**.

Step 9 Repeat steps 5 and 6 for large test-tube **D**.

**(ii)** Prepare a table to record your results in the space provided.
Your table should show:

- the length of the potato sticks at the start
- the length of the potato sticks after 30 minutes
- the change in length of the potato sticks.

[4]

**(iii)** Pick up and examine each potato stick. State **two** physical differences, other than size, that you observe when comparing the four potato sticks.

1 .....

2 .....

[2]

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**(b) (i)** Use all the information and your table of results to identify the solutions **A**, **B**, **C** and **D**. Write your answers in Table 1.1.

**Table 1.1**

| relative concentration of sucrose solution | test-tube letter |
|---|---|
| least concentrated ↓ most concentrated | |
| | |
| | |
| | |

[2]

**(ii)** Explain how your results support your answer to part **(b)(i)**.

.....

.....

.....

.....

.....[3]

**(iii)** Identify **one** source of error with the method and suggest an improvement.

error .....

.....

improvement .....

.....

.....

[2]

**(iv)** State **one** of the controlled variables for this investigation.

.....

.....[1]

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**(c)** Another investigation was carried out into the effect of different concentrations of sucrose solution on potato sticks.

In this investigation students decided to measure the change in mass rather than the change in length.

The students followed a similar method to the one in your investigation but they left the potato sticks to soak for three hours instead of 30 minutes.

**(i)** Suggest why the students left the potato sticks in the solutions for three hours instead of 30 minutes.

.....

.....

.....[1]

**(ii)** The students dried the potato sticks on paper towels before measuring the mass of each potato stick.

Suggest why this step was **not** important in your investigation, where length was measured.

.....

.....

.....[1]

Table 1.2 shows their results.

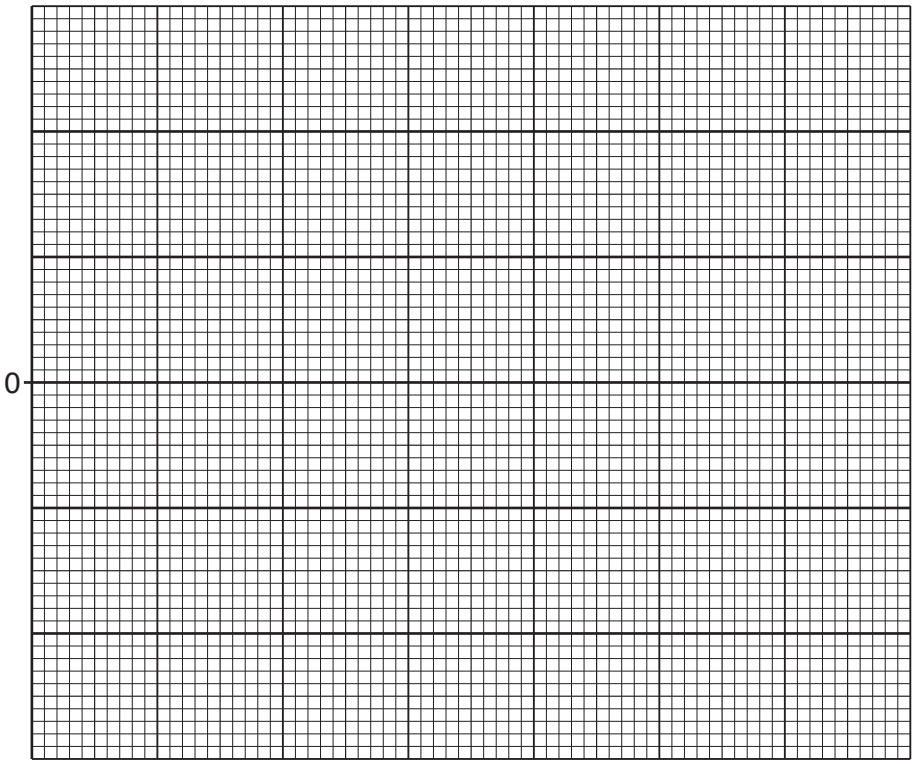
**Table 1.2**

| concentration of sucrose solution /g per $dm^3$ | percentage change in mass |
|---|---|
| 0 | 29.5 |
| 70 | 12.0 |
| 140 | –3.0 |
| 210 | –15.0 |
| 280 | –26.0 |
| 350 | –29.5 |

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**(iii)** Using Table 1.2, plot a graph on the grid to show the effect of the concentration of sucrose solution on the percentage change in mass.

The *y*-axis has been started for you.




[4]

**(iv)** Use your graph to find the concentration of sucrose solution that would cause **no change** in mass of the potato stick.
Mark this concentration on your graph with a **+** and record the concentration.
Include the unit.

.....
[2]

**(v)** Students tested other potatoes and found different values for the concentration of sucrose solution that would cause no change in mass.

Suggest **one** reason for this.

.....

.....

.....[1]

**[Total: 24]**

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**[Turn over**

**2** You are provided with a flower. Some of the petals have been removed.

Observe the flower using a hand lens.

**(a)** Draw a large diagram of the flower.

[4]

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**(b)** Fig. 2.1 shows a different kind of flower.




magnification ×2.0

**Fig. 2.1**

**(i)** Measure the length of the labelled anther in the photograph.

length of anther ..... mm [1]

**(ii)** Use your answer to **2(b)(i)** and the equation to calculate the actual length of the anther.

$$\text{magnification} = \frac{\text{length of anther on photograph}}{\text{actual length of anther}}$$

Show your working.

actual length of anther .....mm
[2]

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**(c)** After pollination and fertilisation, seeds will develop. These will disperse to new environments. If conditions are suitable they will then germinate.

A student put some seeds on wet cotton wool in a Petri dish and left them to germinate. The student counted the number of seeds that had germinated.

Describe a method the student could use to find the best or optimum temperature for the germination of seeds.

.....

.....

.....

.....

.....

.....

.....

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.....

.....

.....[6]

**(d)** After germination, the growing seedling may get most of its energy from food stores inside the seed.

**(i)** Describe how you could test the food store inside the seed for starch.

.....

.....

.....[2]

**(ii)** State the result that shows starch is present.

.....[1]

**[Total: 16]**

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