Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9619477429

BIOLOGY **5090/31**

Paper 3 Practical Test **May/June 2021**

1 hour 15 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

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 [ ].

For Examiner's Use	
1	
2	
Total	

This document has **8** pages. Any blank pages are indicated.

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In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

1 You are provided with a dish of seedlings that have germinated and then grown for 3–5 days.

You are going to measure the heights of six seedlings and calculate their mean height.

(a) (i) In the space below, construct a table to record your results.

Select six seedlings from the dish and measure the height of each stem to the nearest millimetre.

Enter your results in the table.

Calculate the mean height and record it in your table.

[5]

(ii) State **two** possible sources of error in measuring the seedlings.

1. .....

.....

2. .....

.....

[2]

(iii) Use the apparatus provided to cut or crush some of the seedlings. Add drops of iodine solution to the cut or crushed seedlings.

Record your observations and conclusion from this test.

observations .....

.....

conclusion .....

[2]

In another investigation, some students calculated the mean heights of some seedlings as they grew. They recorded their results.

Grown for 6 days mean height 8 mm.

Grown for 10 days mean height 23 mm.

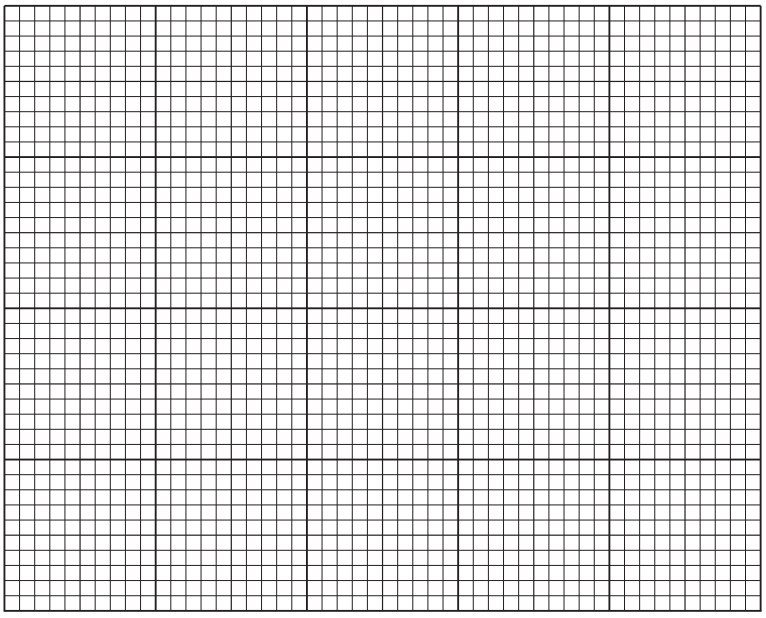
Grown for 12 days mean height 27 mm.

Grown for 15 days mean height 32 mm.

Grown for 20 days mean height 36 mm.

Grown for 23 days mean height 37 mm.

(b) (i) On the grid construct a line graph to show the relationship between time and mean height for these seedlings. Join your points with ruled lines.



[4]

(ii) Use the graph to describe the growth of these seedlings.

.....

..... [2]

(iii) Use the graph to state the time period during which the rate of growth of the seedlings was greatest.

..... [1]

(iv) Use the data and your graph to calculate the rate of growth of the seedlings for the five days from day 15 to day 20.

Space for working.

rate ..... [2]

(v) State **two** variables that need to be controlled whilst growing these seedlings and explain why they need to be controlled.

variable 1.....

variable 2.....

explanation .....

.....

[3]

The seeds needed water to germinate and for the seedlings to grow.

(c) Design an investigation to determine the effect of the pH of water on the growth (mean height) of seedlings. You should use seedlings grown in Petri dishes in a laboratory.

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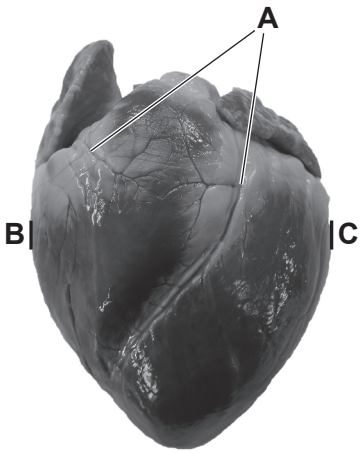
.....

.....

..... [6]

[Total: 27]

2 The photograph shows the surface of a mammalian organ.



(a) (i) Identify this organ ..... [1]

(ii) Name the structures labelled **A** ..... [1]

(b) In the space below, make a large drawing of this organ as it appears in the photograph.

[5]

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(c) (i) **On the photograph**, draw a line between **B** and **C**.

Measure and record this length.

..... mm [2]

(ii) **On your drawing**, draw a line at the same location as the line **B–C**.

Measure and record the length of this line.

..... mm [2]

(iii) Use your measurements in **(c)(i)** and **(c)(ii)** to calculate the magnification of your drawing compared to the photograph. Give your answer to one decimal place.

Space for working.

magnification × ..... [2]

[Total: 13]

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