GradeMax

Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

3854609403

BIOLOGY **0610/52**

Paper 5 Practical Test **February/March 2018**

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	

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

This document consists of **10** printed pages and **2** blank pages.

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1 You are going to investigate the effect of temperature on water uptake in celery stalks.

Water is transported in the xylem tissue of plant stems.

Read all the instructions but DO NOT CARRY THEM OUT until you have drawn a table for your results in the space provided in 1(a)(i).

You are provided with two celery stalks of the same length and two small beakers that contain a red stain.

Step 1 Place one of the small beakers containing red stain into the large beaker labelled **cool**. Place the other small beaker containing red stain into the large beaker labelled **warm**. The large beakers will act as water-baths.

Step 2 Raise your hand when you are ready for water to be added to the two water-baths. Add ice water to the **cool** water-bath and warm water to the **warm** water-bath. Make sure that the water in the water-baths does not go into the small beakers of red stain.

Step 3 Leave the small beakers containing the red stain in the water-baths for 3 minutes.

Step 4 After 3 minutes, put one celery stalk into each beaker of red stain and leave them in the water-baths for 10 minutes.

Step 5 Label one white tile **cool** and the other white tile **warm**.

You can continue with other questions during this time.

Step 6 After 10 minutes remove the celery stalk from the **warm** beaker of red stain and place it on the tile labelled **warm**. Remove the celery stalk from the **cool** beaker of red stain and place it on the tile labelled **cool**.

Step 7 On the tile labelled **warm**, cut a section across the celery stalk, 5 mm from the end that was in the red stain, as shown in Fig. 1.1.

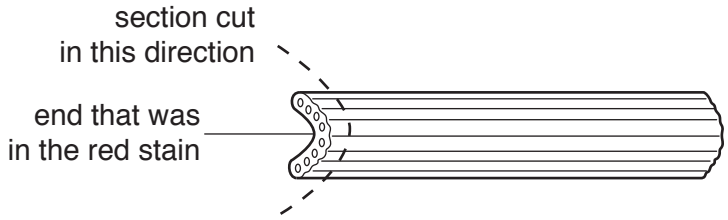


Fig. 1.1

Step 8 Use a hand lens to see if the red stain is visible in the xylem of the cut section of the celery stalk. Fig. 1.2 shows the location of the xylem tissue in a cut section of a celery stalk.

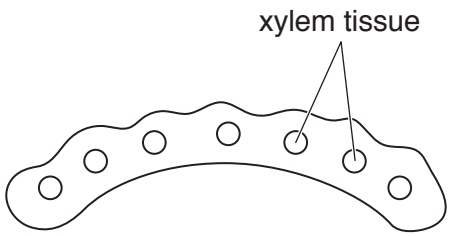


Fig. 1.2

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Step 9 If the red stain is visible, cut another 5 mm section from the celery stalk.

Step 10 Repeat steps 8 and 9 until you cut a section in which the red stain is **not** visible.

Step 11 Count the number of 5 mm sections you have cut and record this number in your table in **1(a)(i)**.

Step 12 Repeat steps 7 to 11 with the other celery stalk on the tile labelled **cool**.

(a) (i) Prepare a table and record your results in your table, in the space provided.

Your table should include:

- the temperature (cool or warm) of the red stain
- the number of sections that were stained in 10 minutes
- the total distance moved by the red stain in 10 minutes.

[4]

(ii) Use your data to calculate the rate of movement of the red stain in the celery stalk at each temperature.

Space for working.

warm ..... mm per minute

cool ..... mm per minute
[2]

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[Turn over

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(iii) State a conclusion for your results.

.....

.....

.....[1]

(b) State **two** variables which were kept constant in this experiment.

1 .....

2 .....
[2]

(c) One way of improving the method used in this investigation would be to repeat it a number of times.

Identify **two other** sources of error in this investigation.

For each error, suggest an improvement to minimise the effect of the error.

error 1 .....

.....

improvement 1 .....

.....

.....

error 2 .....

.....

improvement 2 .....

.....

.....
[4]

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(d) Some farmers wanted to investigate the effect of humidity on the rate of transpiration in celery plants.

Fig. 1.3 shows a celery plant being harvested.



Fig. 1.3

One method of measuring the rate of transpiration is to record how long it takes a red stain to travel up the xylem tissue in a celery stalk that still has its leaves attached.

Plan an investigation to determine the effect of humidity on the rate of movement of water through leafy celery stalks.

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.....[6]

[Total: 19]

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2 Fig. 2.1 shows a photomicrograph of a bronchus, surrounded by alveoli and other tissues, in the lung.

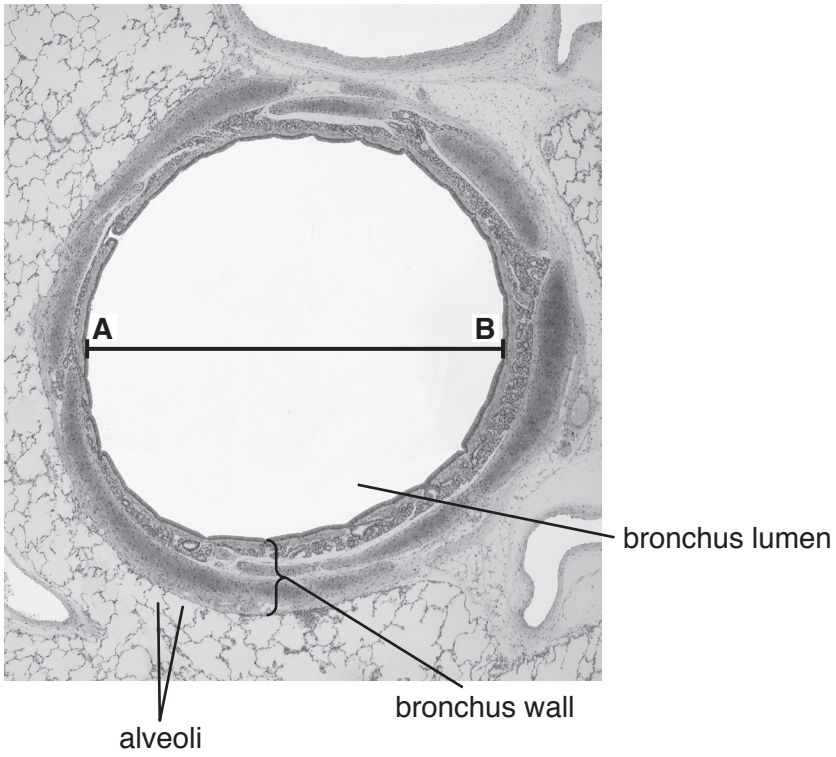


Fig. 2.1

(a) (i) Make a large drawing of the bronchus shown in Fig. 2.1.

Do **not** include any of the alveoli or other tissues in your drawing. Do **not** label your drawing.

[4]

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(ii) The diameter of the bronchus in Fig. 2.1 is shown by the line **AB**.

Measure the length of **AB** on Fig. 2.1. Include the units.

length of **AB** on Fig. 2.1 .....

The actual diameter of the bronchus in Fig. 2.1 is 1.5 mm.

The magnification of the bronchus in Fig. 2.1 can be calculated using the following equation:

$$\text{magnification} = \frac{\text{length of } \mathbf{AB} \text{ on Fig. 2.1}}{\text{actual diameter of the bronchus}}$$

Calculate the magnification of the bronchus in Fig. 2.1.

Give your answer to the nearest whole number.

Space for working.

.....
[2]

(b) A student investigated the effect of exercise on breathing rate.

The breathing rates of five people were measured at rest and after running for different periods of time. The people rested between each period of running.

The results are shown in Table 2.1.

Table 2.1

running time / minutes	breathing rate / breaths per minute					
	person					average
	one	two	three	four	five	
0	20	24	22	26	28	24
2	32	31	28	32	32	31
4	39	41	38	42	40	
6	46	52	52	46	44	48
8	48	50	52	46	44	48
10	49	51	51	46	43	48

(i) Complete Table 2.1 by calculating the average breathing rate for four minutes of running.

Space for working.

[1]

(ii) The student thought that the result for person two at six minutes was an anomaly.

Suggest what the student should do to determine if the result is anomalous.

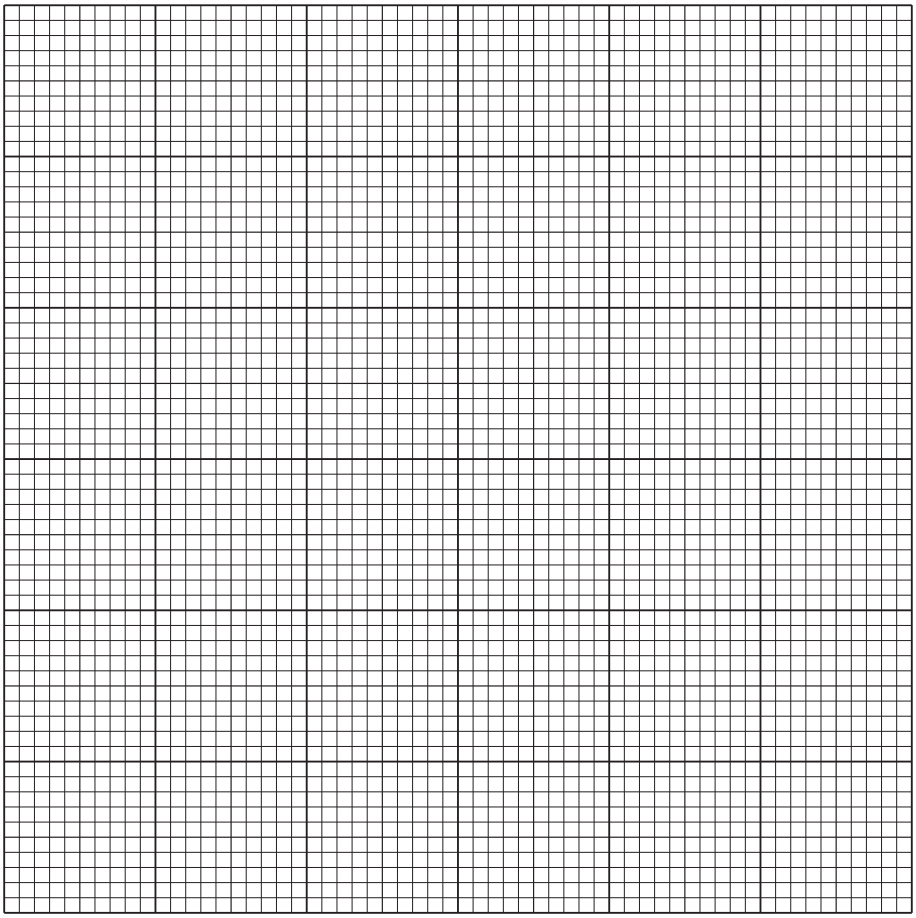
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.....

.....[1]

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(iii) Plot a graph on the grid, to show the relationship between running time and the average breathing rate. Draw a line of best fit.



[4]

(iv) Use your graph to estimate the average breathing rate for one minute of running.

Show on the graph how you obtained your answer.

.....[2]

(v) Use your graph to describe the relationship between running time and the average breathing rate.

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.....[3]

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(c) (i) Suggest **one** safety precaution for this investigation.

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.....[1]

(ii) State **two** variables that should be kept constant during this investigation.

1 .....

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2 .....

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[2]

(iii) State the variable that has been changed (the independent variable) in this investigation.

.....[1]

[Total: 21]

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