Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

5869901559 1

BIOLOGY **0610/53**

Paper 5 Practical Test **October/November 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	

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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You should wear the eye protection provided during the practical work in question 1.

1 Citrus fruits, such as oranges, contain sugars. You are going to investigate the simple (reducing) sugar content of three different citrus fruits.

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)(ii).

Step 1 You are provided with samples of three different types of fruit. Take three separate beakers and label these with the names of the fruits you have been given. Record the names of the fruits in Table 1.1 in **1(a)(i)**.

Step 2 Squeeze the juice from one type of fruit into the labelled beaker.

Step 3 Repeat step 2 with the other two types of fruit.

Step 4 Use the measuring cylinder to measure the volume of juice you have extracted from each type of fruit and record this in Table 1.1 in **1(a)(i)**. Pour the fruit juice back into the labelled beaker when you have finished measuring it.

Rinse the measuring cylinder with the **washing water** after each measurement.

If you have less than 5 cm^3 of each juice raise your hand to obtain more fruit and repeat step 2.

(a) (i)

Table 1.1

	type of fruit	volume of juice / cm^3
1		
2		
3		

[1]

Step 5 Label three large test-tubes **1, 2,** and **3**.

Step 6 Add 2 cm^3 of the juice from fruit **1** to large test-tube **1**.

Step 7 Add 2 cm^3 of **reducing sugar test solution** to large test-tube **1** and place it in the empty beaker labelled **water-bath**. Record the colour of the solution in large test-tube **1** in your table in **1(a)(ii)**.

Step 8 Repeat step **6** and step **7** with the juice from fruit **2** and the juice from fruit **3**.

Step 9 You are now going to add hot water to the beaker labelled **water-bath**.
Raise your hand when you are ready for hot water. Leave the large test-tubes in the water-bath for 10 minutes.

During this time continue with the rest of the questions.

Step 10 After 10 minutes record the colour observed in large test-tubes **1**, **2** and **3** in your table in **1(a)(ii)**.

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(ii) Prepare a table to record your results.

[4]

(iii) State the name of the solution used to test for reducing sugars.

.....[1]

(iv) State which fruits contain reducing sugars.

.....[1]

(v) Explain why it was necessary to record the colour of the reducing sugar test solution and fruit juice mixture **before** heating.

.....

.....

.....[1]

(b) State **one** variable that has been kept constant in the investigation you have carried out.

Describe how this variable has been kept constant.

variable .....

how it has been kept constant .....

.....

.....
[2]

(c) Identify **two** sources of error in the method.

For each of these errors, describe how the method could be improved to reduce the error.

error .....

improvement .....

.....

.....

error .....

improvement .....

.....

.....
[4]

(d) Describe a test that could be used to determine if the fruits you have tested contain protein.

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.....[2]

(e) Citrus fruits are a good source of vitamin C.

DCPIP can be used to test for vitamin C. When DCPIP reacts with vitamin C the colour of the solution changes from dark blue to colourless.

Vitamin C can be destroyed by heating it at high temperatures or by heating it for a long time.

Fruit juices are often heat treated to kill bacteria which allows the juice to be kept for a long time without being refrigerated.

A student wanted to investigate the effect of heating on the vitamin C content of fruit juice.

Describe a method the student could use for their investigation.

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.....[6]

(f) You are provided with a slice of orange.

Draw a large diagram of the slice of orange.

[4]

[Total: 26]

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2 Hormones are involved in tropic responses in plants, such as gravitropism and phototropism. Auxin is a plant growth hormone.

A student investigated the length of roots from seedlings grown in different concentrations of auxin.

The student measured the root length of five of the seedlings grown in each concentration of auxin.

Table 2.1 shows the results.

Table 2.1

percentage concentration of auxin	root length / mm					average root length / mm
	1	2	3	4	5	
0.0	15	16	18	14	15	15.6
0.2	18	17	19	20	18	
0.4	24	21	22	22	23	22.4
0.6	17	16	18	17	19	17.4
0.8	13	12	14	5	12	11.2
1.0	12	10	10	12	11	11.0

(a) (i) Calculate the missing average value from the Table 2.1.

Show your working and give your answer to one decimal place in Table 2.1.

[2]

(ii) Scientists do not include anomalous data in their average calculations.

One of the pieces of data in Table 2.1 is not consistent with the other results for that concentration. This means it is anomalous.

Circle the anomalous data in Table 2.1.

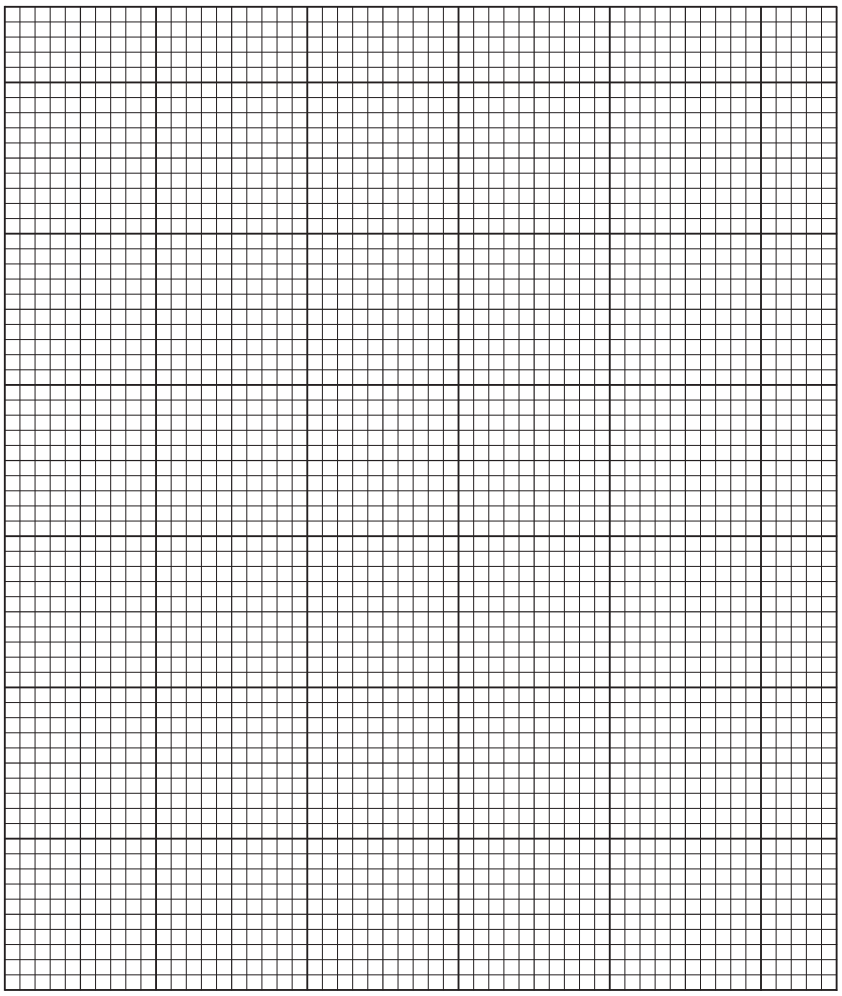
Calculate the correct average for this concentration of auxin, excluding the anomalous data. Give your answer to one decimal place.

Space for working.

.....mm
[2]

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(iii) Plot a graph on the grid to show the effect of auxin concentration on the average root length.



[4]

(iv) Describe the pattern shown by the data in your graph.

.....

.....

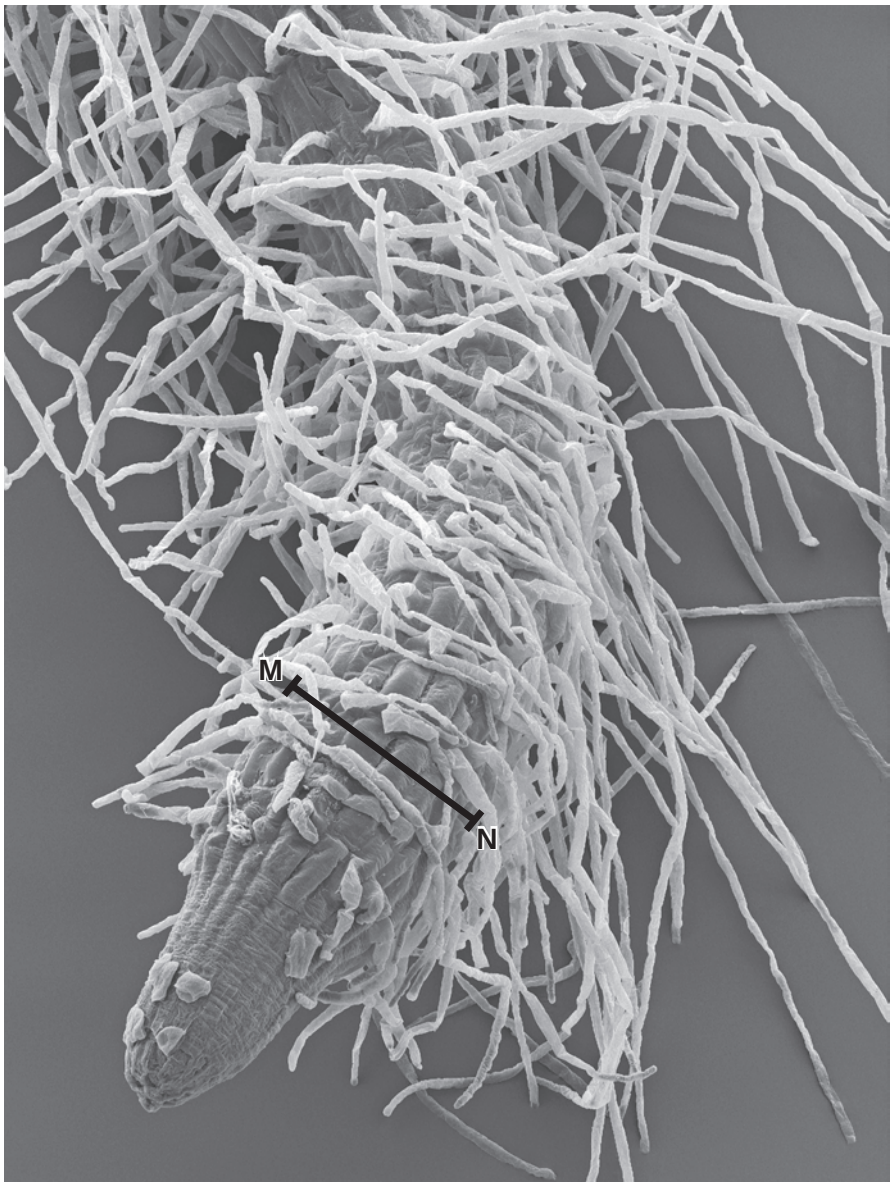
.....

.....

.....

.....[3]

(b) Fig. 2.1 shows the root tip of a poppy seedling.



magnification × 120

Fig. 2.1

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Measure the length of the line **MN** on Fig. 2.1. Include the unit.

length of **MN** .....

Calculate the actual size of the root tip at **MN** using the formula. Include the unit in your answer.

$$\text{magnification} = \frac{\text{length of } \mathbf{MN} \text{ on Fig. 2.1}}{\text{actual size of } \mathbf{MN}}$$

Space for working.

.....
[3]

[Total: 14]

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