Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

BIOLOGY **0610/63**

Paper 6 Alternative to Practical **October/November 2017**

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.

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 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.

DC (RW/SW) 134168/3
© UCLES 2017

CAMBRIDGE International Examinations

1 Citrus fruits, such as oranges, contain sugars.

A student investigated the simple (reducing) sugar content of three different citrus fruits.

Step 1 The student was provided with three fruits; orange, grapefruit and lemon.

Step 2 The juice from the orange was squeezed into a labelled beaker.

Step 3 Step 2 was repeated for the grapefruit and the lemon.

Step 4 The student put the juice they extracted into three measuring cylinders.

These are shown in Fig. 1.1.

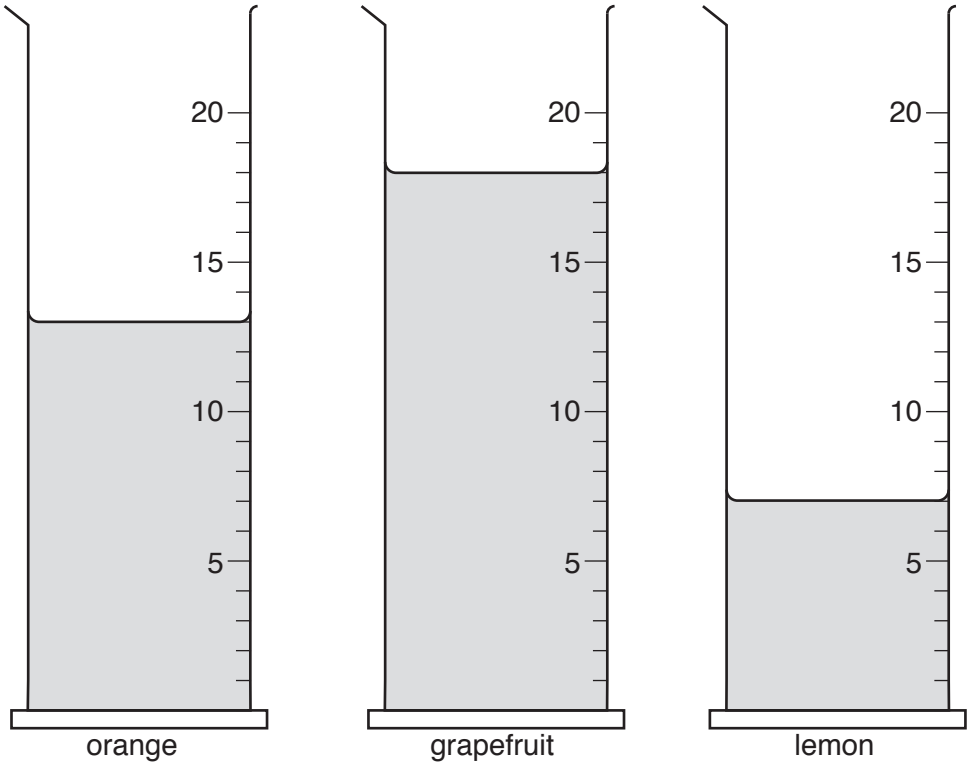


Fig. 1.1

(a) (i) In Table 1.1 record the volume of juice shown in each measuring cylinder in Fig. 1.1.

Table 1.1

type of fruit	volume of juice / cm^3
orange	
grapefruit	
lemon	

[1]

Step 5 The student added 2 cm^3 of the orange juice and 2 cm^3 of the solution used to test for reducing sugars to a test-tube labelled orange and recorded the colour of the liquid.

Step 6 The student repeated step 5 for the grapefruit juice and the lemon juice.

Step 7 The test-tubes were then put into a water-bath and left for five minutes.

Step 8 The colour of the liquid in the test-tubes was recorded after five minutes.

The student's observations are shown in Fig. 1.2.

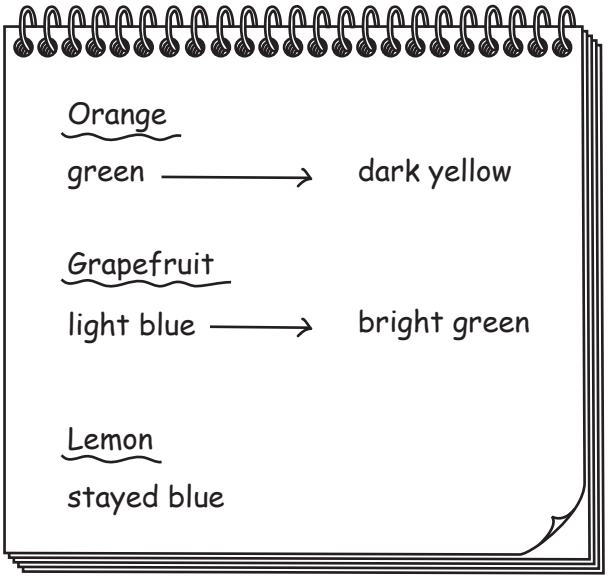


Fig. 1.2

(ii) Use the information in Fig. 1.2 to prepare a table to record the student's results in the space provided.

[3]

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

.....[1]

(iv) Suggest a suitable temperature for the water-bath used in step 7.

.....[1]

(v) State which fruits contain reducing sugars.

.....[1]

(vi) Explain why the student recorded the colour of the reducing sugar test solution and fruit juice mixture **before** heating.

.....

.....

.....[1]

(b) State **one** variable that was kept constant in this investigation.

Describe how this variable was 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 contained protein.

.....

.....

.....

.....[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.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[6]

(f) Fig. 1.3 shows a photograph of a slice of orange.

Fig. 1.3

Draw a large diagram of the slice of orange.

[4]

[Total: 26]

© UCLES 2017

BLANK PAGE

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.

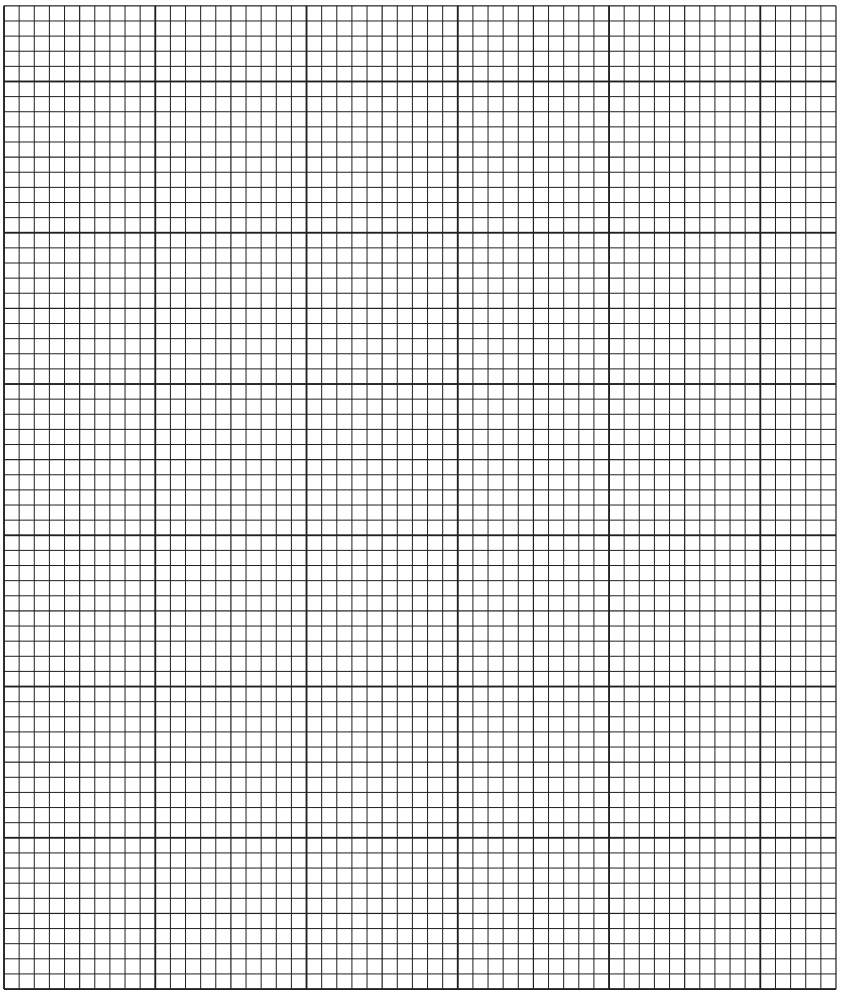
Circle the anomalous data in Table 2.1.

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]

(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.

.....

.....

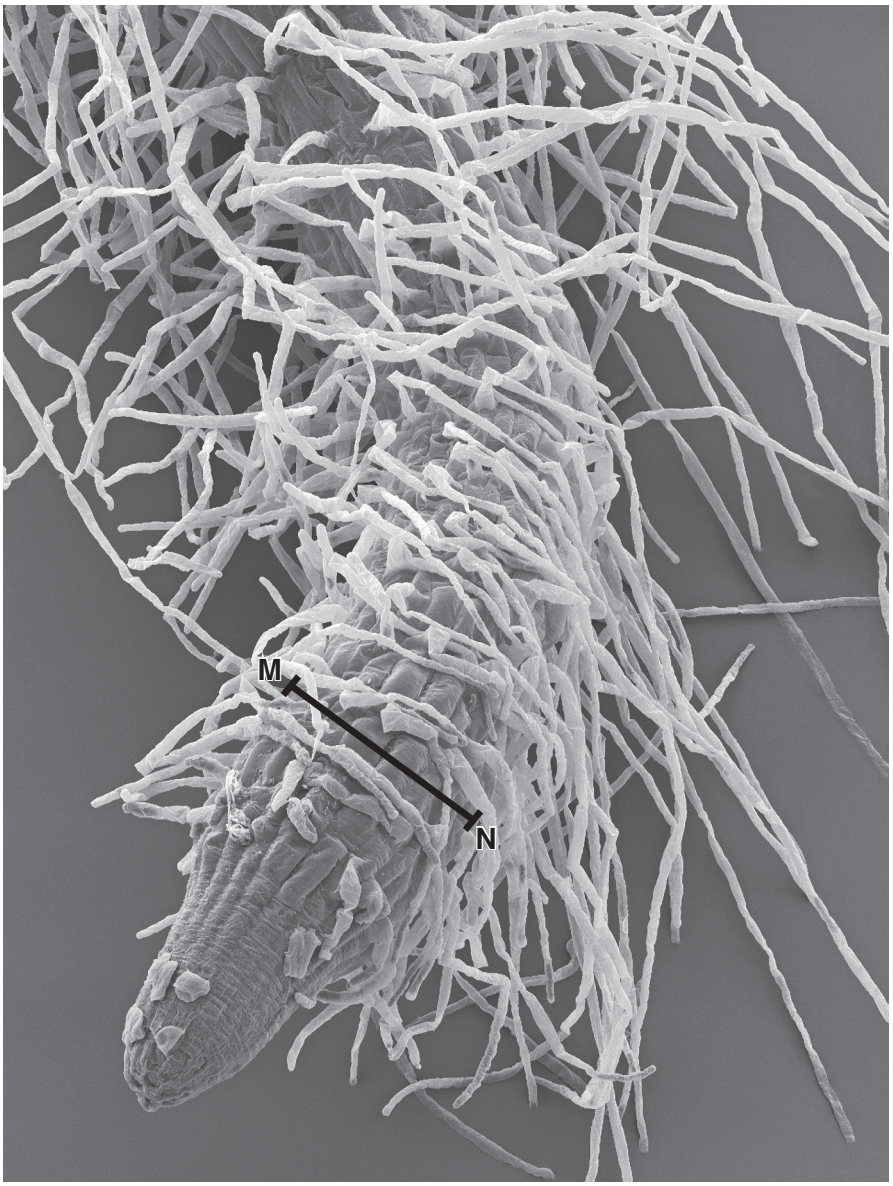
.....

.....

.....

.....[3]

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



magnification ×120

Fig. 2.1

© UCLES 2017

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]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2017