Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

2398243725

BIOLOGY **0610/51**

Paper 5 Practical Test **October/November 2015**

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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Read through all of the questions in this paper carefully before starting work.

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

1 During digestion, the enzyme amylase breaks down starch to maltose, a reducing sugar.

Iodine solution can be used to test for the presence of starch.

- Label a white tile **5** in one corner.
- Place two drops of iodine solution onto tile **5**. These drops must be 2 to 3 cm apart, in the same corner of the white tile.
- Use a glass rod to place a drop of the starch solution onto one of the drops of iodine solution. Dry the glass rod with a paper towel.
- Use the glass rod to place a drop of water onto the other drop of iodine solution. Dry the glass rod with a paper towel.

(a) (i) Record your observations.

starch .....

.....

water .....

.....
[2]

(ii) State why water was used.

.....

.....[1]

- Place a further eight drops of iodine solution onto tile **5**, as shown in Fig. 1.1.

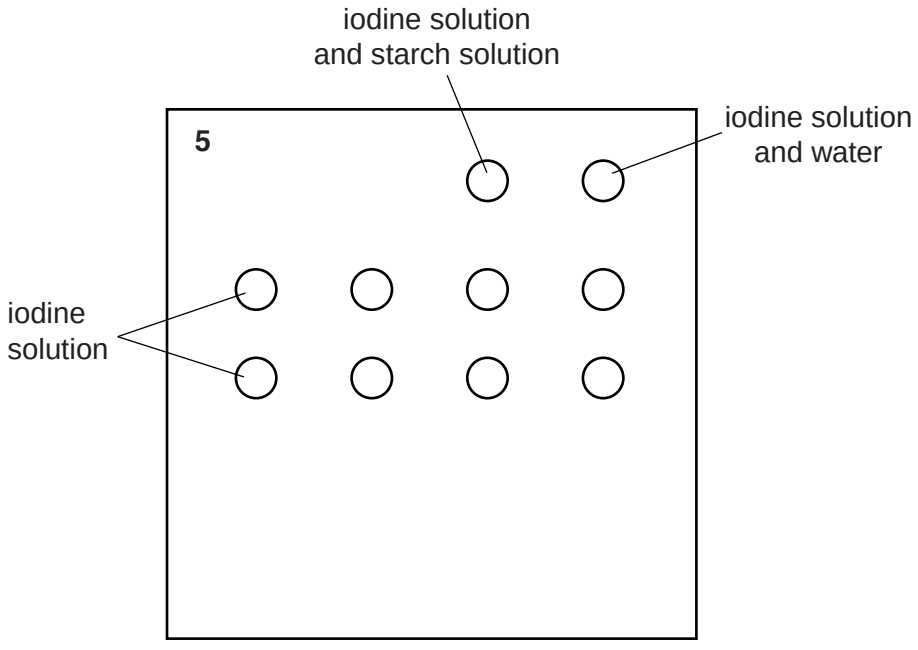


Fig. 1.1

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- Label another white tile **7**.
- Place eight drops of iodine solution onto tile **7**, as in the bottom two rows in Fig. 1.1.
- Label two large test-tubes **5** and **7**.
- Place 5 cm^3 of starch solution into each of the large test-tubes **5** and **7**.

When a mixture of starch and amylase is tested at regular intervals, the intensity of the colour is an indication of how much starch is present.

You are going to investigate the effect of pH (pH5 and pH7) on the activity of amylase.

Read the instructions but **DO NOT** carry them out until you have drawn a table for your results, in the space provided in **(b)(i)**.

- Test-tube **A5** contains 4 cm^3 of amylase at pH5. Test-tube **A7** contains 4 cm^3 of amylase at pH7.
- At the same time, add the contents of test-tube **A5** to the starch solution in large test-tube **5 and** add the contents of test-tube **A7** to the starch solution in large test-tube **7**.
- Carefully mix the contents of large test-tube **5** using a clean glass rod. Leave the glass rod in the large test-tube.
- Carefully mix the contents of large test-tube **7** using a clean glass rod. Leave the glass rod in the large test-tube.
- Record the time. .....
- After one minute, use the glass rod to remove one drop from large test-tube **5**. Place this drop onto the first drop of iodine solution on tile **5**.
  Dry the glass rod on a paper towel and place it back into large test-tube **5**.
- At the same time use the glass rod in large test-tube **7** to remove one drop from large test-tube **7**. Place this drop onto the first drop of iodine solution on tile **7**.
  Dry the glass rod on a paper towel and place it back into large test-tube **7**.
- Repeat the testing process for large test-tubes **5** and **7** every minute, for a further seven minutes.
- Record your observations in your table in **b(i)**.

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[Turn over

(b) **(i)** Prepare a table to record your observations of the starch tests on the contents of the large test-tubes **5** and **7**.

[3]

(ii) Carry out the investigation and record your observations in the table you have prepared.
[3]

(c) Compare the results obtained for large test-tubes **5** and **7**.

.....

.....

.....

.....[2]

(d) Describe **three** ways in which this investigation could be improved.

1.....

.....

2 .....

.....

3 .....

.....
[3]

[Total: 14]

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2 You are provided with part of a maize cob. This is composed of many individual fruits, known as grains.

(a) (i) Make a large drawing of a group of **five** grains viewed from above, as in Fig. 2.2 on page 6.

[3]

(ii) Remove **one** of the grains and measure the length from the point of attachment to the outer surface, as shown in Fig. 2.1. Include the unit.

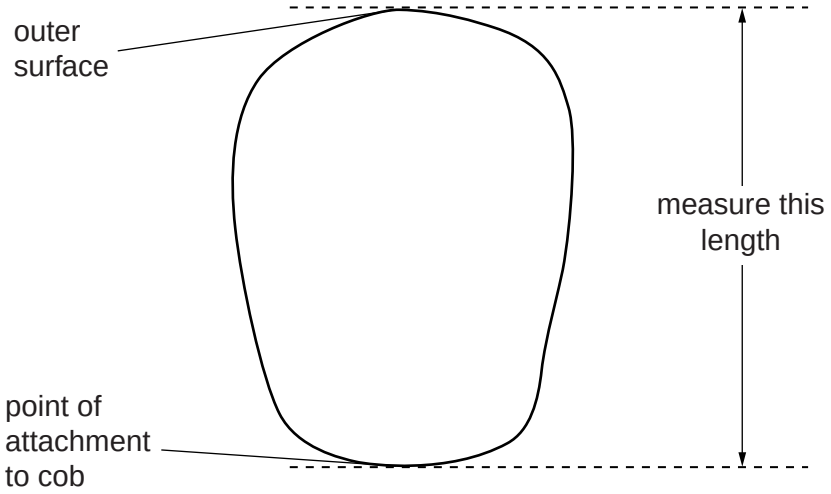


Fig. 2.1

length .....[2]

(iii) Make a drawing of this grain, **six times** its actual size.

Label the point of attachment to the cob.

[3]

Many colours of maize grains are known. The colour is inherited.

Fig. 2.2 shows part of a cob with light and dark coloured grains.

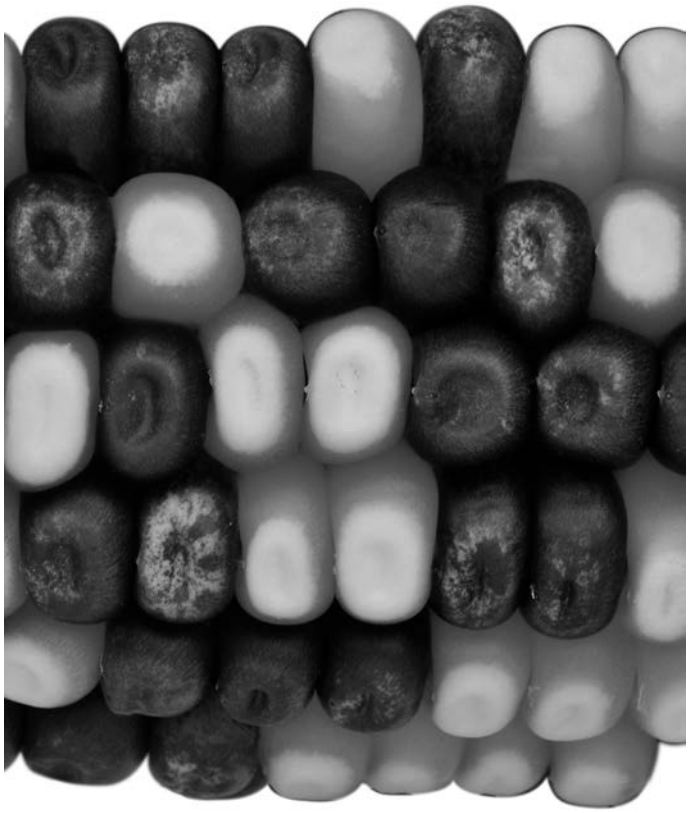


Fig. 2.2

(b) (i) Complete Table 2.1 by counting the number of light and dark coloured grains.

Table 2.1

number of grains	
light	dark

[1]

(ii) Use the data in Table 2.1 to suggest the phenotypic ratio of light to dark coloured grains.

.....[1]

(iii) Describe **one** visible phenotypic difference, other than colour, between the grains shown in Fig. 2.2.

.....

.....[1]

Maize is used as a food source for humans and livestock. It contains mainly starch but also other nutrients including proteins and fat.

(c) Describe how to test maize grains for the presence of protein and fat.

protein .....

.....

.....

.....

fat .....

.....

.....

.....

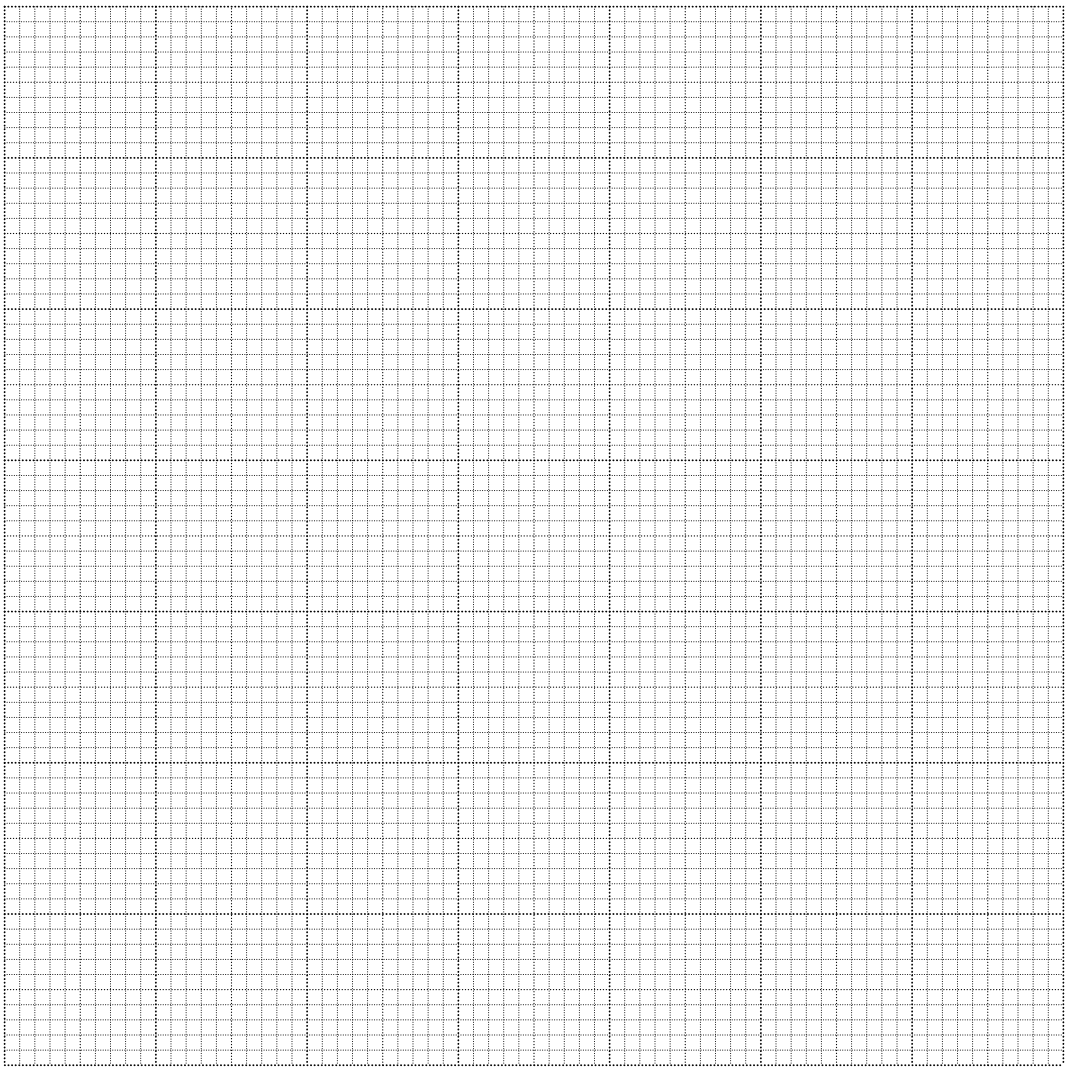
[5]

Maize is a cereal. Cereals form a high proportion of the daily energy intake for many people. The protein and fat content of maize and five other cereals is shown in Table 2.2.

Table 2.2

cereal	content per 100 g of dried cereal / g	
	protein	fat
maize	9.5	3.8
millet	10.4	5.0
oats	12.6	7.5
rice	7.1	1.8
sorghum	9.7	3.4
wheat	13.8	2.0

(d) (i) Plot the data from Table 2.2 to show the protein **and** fat content of these six cereals. Use the same set of axes for both protein and fat.



[6]

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(ii) Approximately how many times more protein is there in 100 g of wheat compared with 100 g of rice?

.....[1]

(iii) Use Table 2.2 to identify the cereal that provides the largest energy content per 100 g. Explain your choice of cereal.

.....

.....

.....

.....

.....

.....[3]

[Total: 26]

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