UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

5439306249

BIOLOGY **0610/63**

Paper 6 Alternative to Practical **May/June 2013**

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 a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, 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 document consists of **13** printed pages and **3** blank pages.

© UCLES 2013

For Examiner's Use

1 **(a)** Some students investigated the effect of enzyme concentration on starch.
They were provided with a Petri dish containing a layer of starch agar jelly.
The students cut three small holes in the starch agar jelly and labelled them as shown in Fig. 1.1.

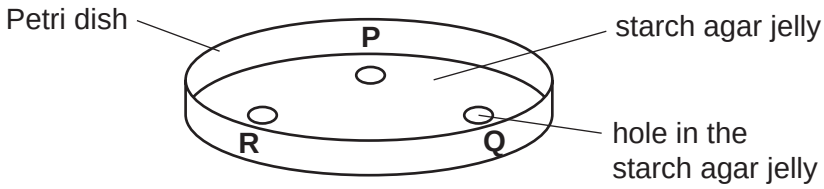


Fig. 1.1

They placed the starch agar jelly that had been cut out of the holes on a white tile and added two drops of dilute iodine solution to each piece.

The dilute iodine solution changed from yellow/brown to deep blue.

(i) State why the colour changed.

.....

..... [1]

The students were given two different concentrations of the same enzyme, solution **1** and solution **2**.

- They put two drops of enzyme solution **1** into hole **P**.
- They put two drops of enzyme solution **2** into hole **Q**.
- They put two drops of water into hole **R**.
- After 15 minutes dilute iodine solution was poured over the surface of the starch agar jelly.

© UCLES 2013

Fig. 1.2 shows the appearance of the surface of the starch agar jelly after dilute iodine solution had been added. The Petri dish was placed on a piece of squared paper.

For Examiner's Use

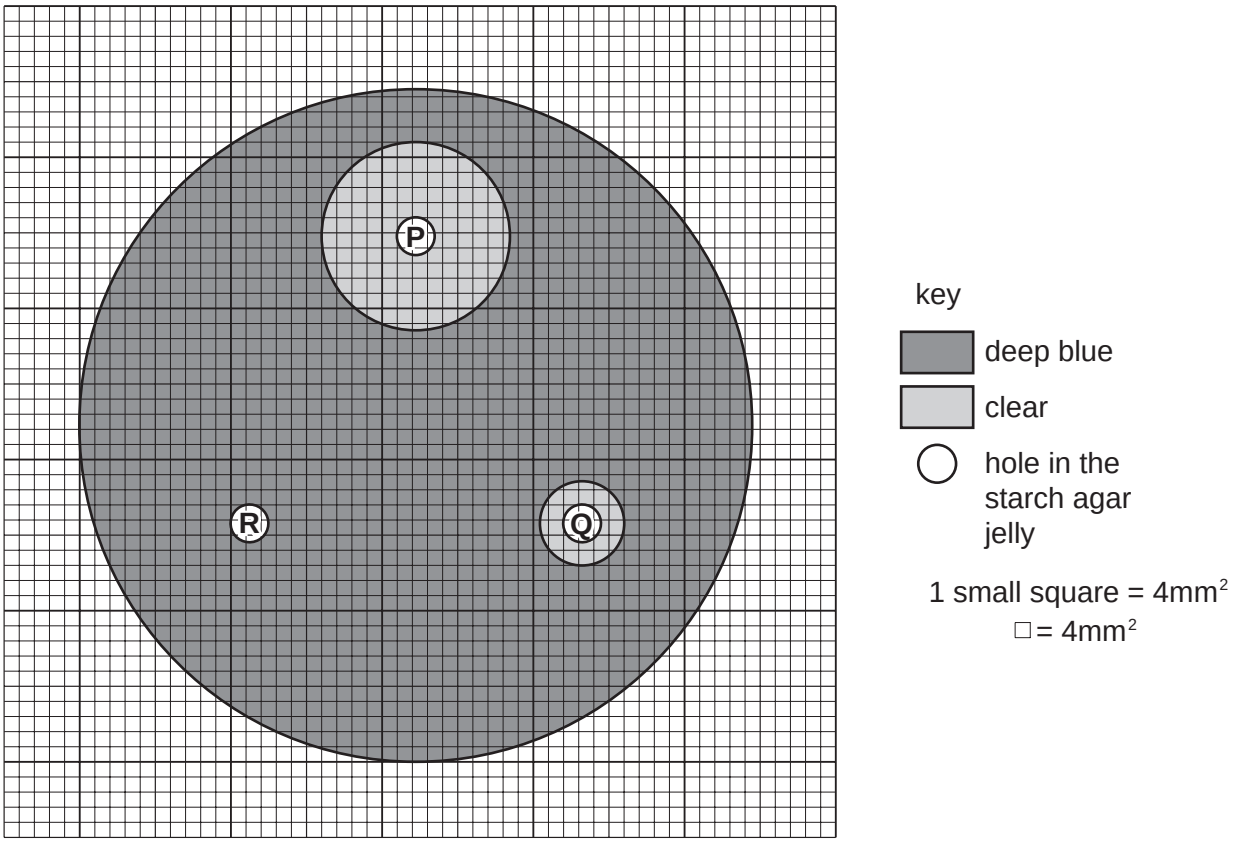


Fig. 1.2

(ii) Holes **P**, **Q** and **R** are the same size.
Use the grid and count the squares to estimate the area of hole **R**.

area of hole **R** .....mm² [1]

For Examiner's Use

(iii) Describe the results shown in Fig. 1.2.

.....

.....

.....

.....

..... [3]

(iv) Explain the results shown in Fig. 1.2.

.....

.....

.....

.....

..... [3]

(v) Suggest the name of the enzyme used in this investigation.

..... [1]

(vi) State why water was added to hole **R**.

.....

..... [1]

(b) Germinating seeds produce enzymes that change stored food into soluble materials.

For Examiner's Use

Suggest a method similar to that in **(a)** that you would use to find out if germinating pea seeds produce the same enzyme as in enzyme solutions **1** and **2**.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(c) Fig. 1.3 shows a pea seedling.

For Examiner's Use



Fig. 1.3

Make a large, labelled drawing of the pea seedling in the space provided on page **7**.

© UCLES 2013

Draw the pea seedling in the space below.

[4]

(d) Fig. 1.4 shows pea seeds in a pod.

For Examiner's Use

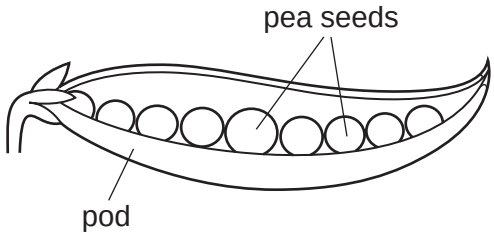


Fig. 1.4

The number of pea seeds in a pod varies.
Two students picked a sample of 23 pods.
They opened the pods and counted the number of pea seeds.

Fig. 1.5 shows the students' results.

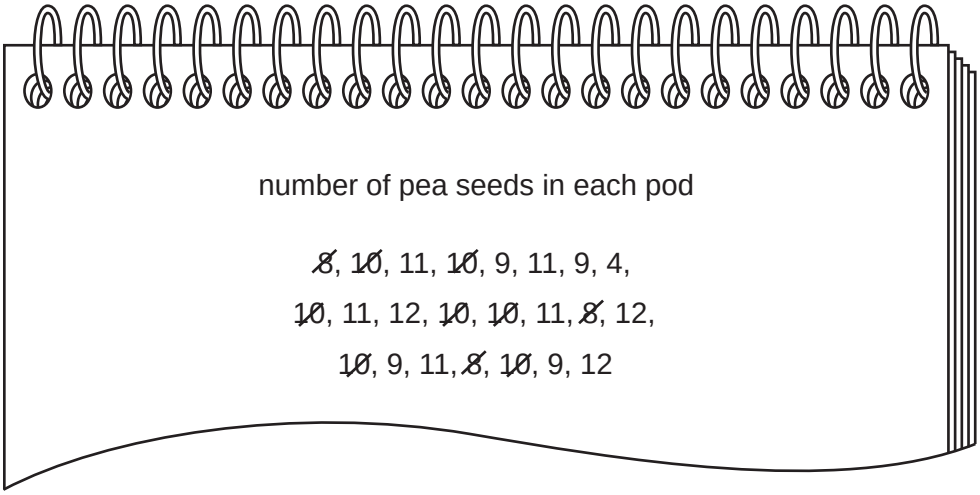


Fig. 1.5

For Examiner's Use

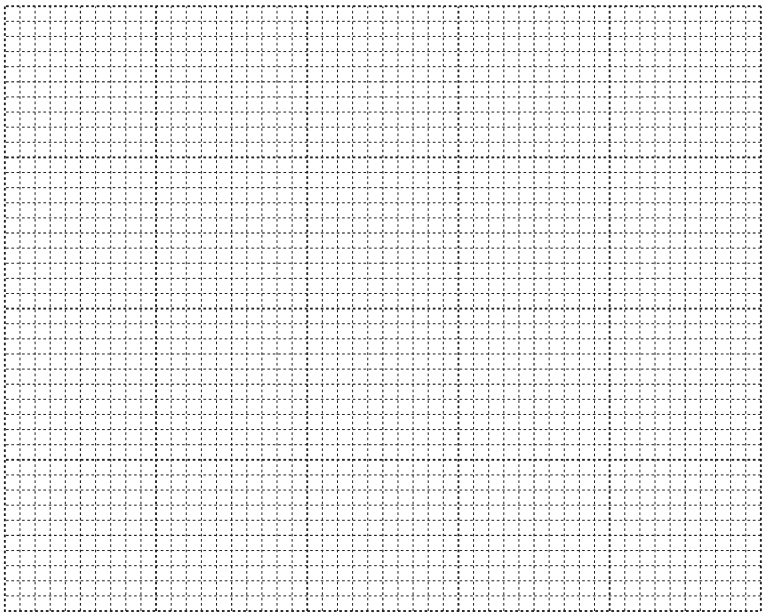
(i) Complete Table 1.1 using the results from Fig. 1.5 to show how many pods there were with each number of pea seeds.
Two rows have been completed for you.

Table 1.1

number of pea seeds in each pod	tally	number of pods
4		
5		
6		
7		
8	///	3
9		
10	~~////~~ //	7
11		
12		

[2]

(ii) Draw a histogram on Fig. 1.6 to show the number of pods with each number of pea seeds.



[4]

Fig. 1.6

(iii) Put an **X** in the bar on the graph which seems to be anomalous. [1]

For Examiner's Use

(iv) Most pods contained 10 or 11 pea seeds.

Suggest a reason for some pods containing 8 or 12 pea seeds.

.....

..... [1]

[Total: 26]

2 Fig. 2.1 shows an arthropod.



× 2.5

Fig. 2.1

(a) You are going to calculate the actual length of the part of the leg that is marked **ST** in Fig. 2.1.

Measure the length of line **ST**.

length of line **ST** ..... mm

Calculate the actual length of the part of the leg that is marked **ST**.

Show your working.

actual length of leg ..... mm [3]

(b) Use features, **visible** in Fig. 2.1, to identify the group of arthropods to which this animal belongs.

For Examiner's Use

Give **two** reasons for your answer.

Group .....

reason 1 .....

.....

reason 2 .....

..... [3]

[Total: 6]

3 **(a)** Fig. 3.1 shows a section of a dicotyledonous root as seen with a microscope.

For Examiner's Use

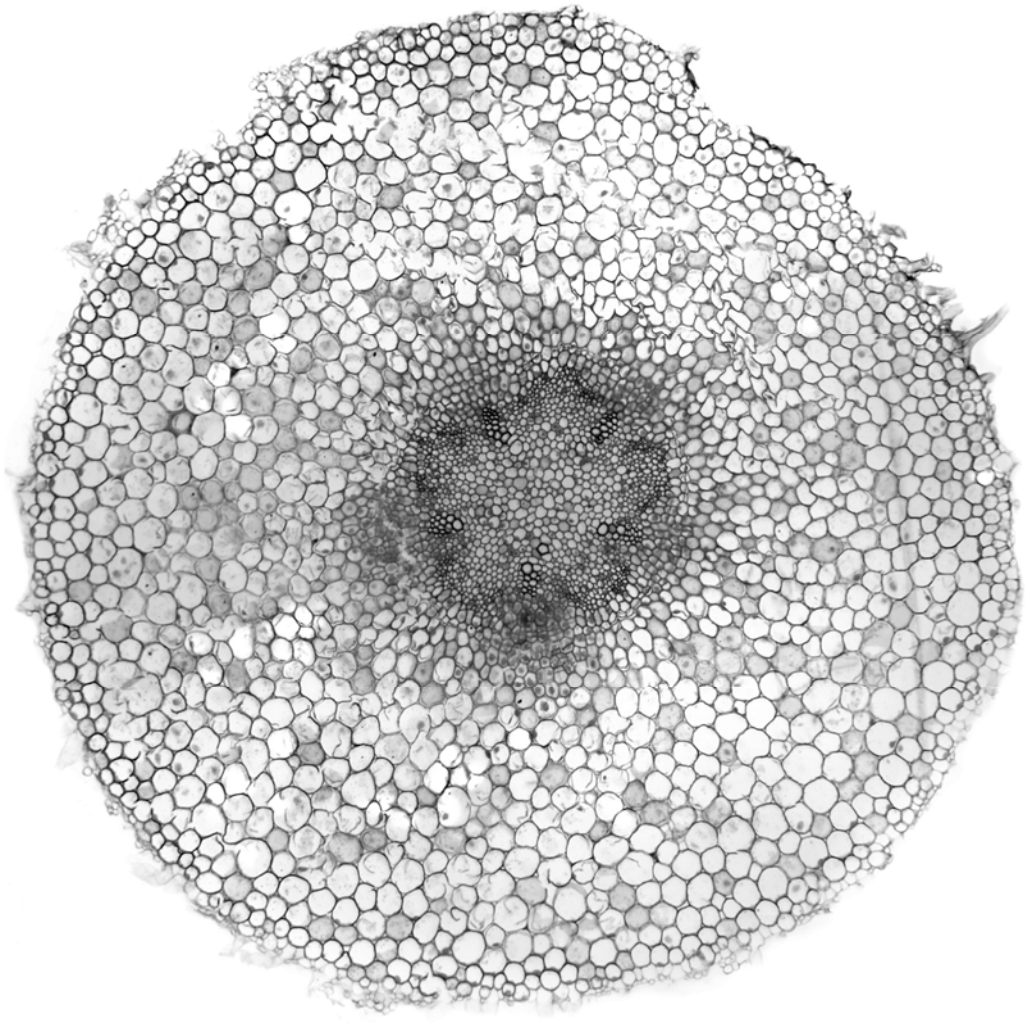


Fig. 3.1

On Fig. 3.1:
draw a line to a root hair cell and label it;
draw a line to a cortex cell and label it. [2]

For Examiner's Use

(b) When stems have just been cut, drops of liquid often appear on the cut surface of the stem.

A dicotyledonous stem was cut and the liquid was collected and tested for:

- water;
- reducing sugar;
- protein;
- fat.

The results are shown in Table 3.1.

Complete Table 3.1 to show the reagents and final colours.

Table 3.1

substance	reagent	results		
		initial colour	final colour	positive or negative (✓or ×)
water	cobalt chloride	blue		✓
reducing sugar		blue		✓
protein		blue		×
fat	ethanol + water	colourless		×

[6]

[Total: 8]

BLANK PAGE

BLANK PAGE

BLANK PAGE

Copyright Acknowledgements:

Question 3 Fig. 3.1 © Ref: C003 / 4134; *Broad bean root, light micrograph*; Dr Keith Wheeler, Science Photo Library.

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.

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.