Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **October/November 2014**

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, 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.

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 **11** printed pages and **1** blank page.

CAMBRIDGE International Examinations

1 Living cells produce catalase to break down the toxins, such as hydrogen peroxide, that are formed in cells.

Catalase breaks down hydrogen peroxide to form oxygen and water.

$$\text{hydrogen peroxide} \xrightarrow[\text{catalase}]{} \text{oxygen + water}$$

An investigation was carried out to find out if ripe fruits produce more catalase than unripe fruits.

The unripe pepper fruits of *Capsicum annuum* are green in colour when they start developing. As the fruit ripens it turns red and tastes sweeter.

Extracts were prepared from both green and red pepper fruits.

Small squares of filter paper were soaked in the extracts and dried for testing.

The pieces of filter paper were placed in hydrogen peroxide solution as shown in Fig. 1.1.

As the catalase in the extracts breaks down the hydrogen peroxide, the pieces of filter paper rise to the surface. The time taken for each piece of filter paper to reach the surface was measured.

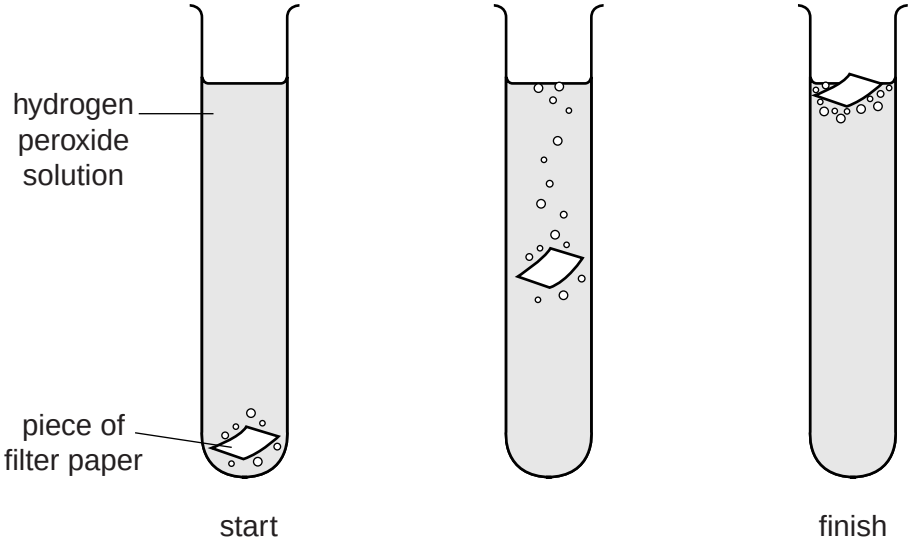


Fig. 1.1

The procedure was carried out to obtain three results for red pepper fruits and three results for green pepper fruits.

The measurements are shown in Table 1.1.

Table 1.1

pepper extract	time / s		
	filter paper 1	filter paper 2	filter paper 3
red	50	35	30
green	75	60	62

(a) Calculate the total time and the mean time for each extract.

Give your answers to the nearest whole number.

red pepper extract: total time ..... s

mean time ..... s

green pepper extract: total time ..... s

mean time ..... s

[2]

(b) Describe and explain whether this investigation supports the statement 'ripe fruits produce more catalase than unripe fruits'.

.....

.....

.....

.....

.....

.....[3]

(c) State **two** variables that must be controlled to compare the catalase activity in the extracts.

1.....

2.....

[2]

(d) The red pepper fruit is said to be sweeter than the unripe green pepper fruits.

Describe how you could safely test if the sweetness is due to the presence of reducing sugar.

.....

.....

.....

.....

.....

.....

.....

.....

.....

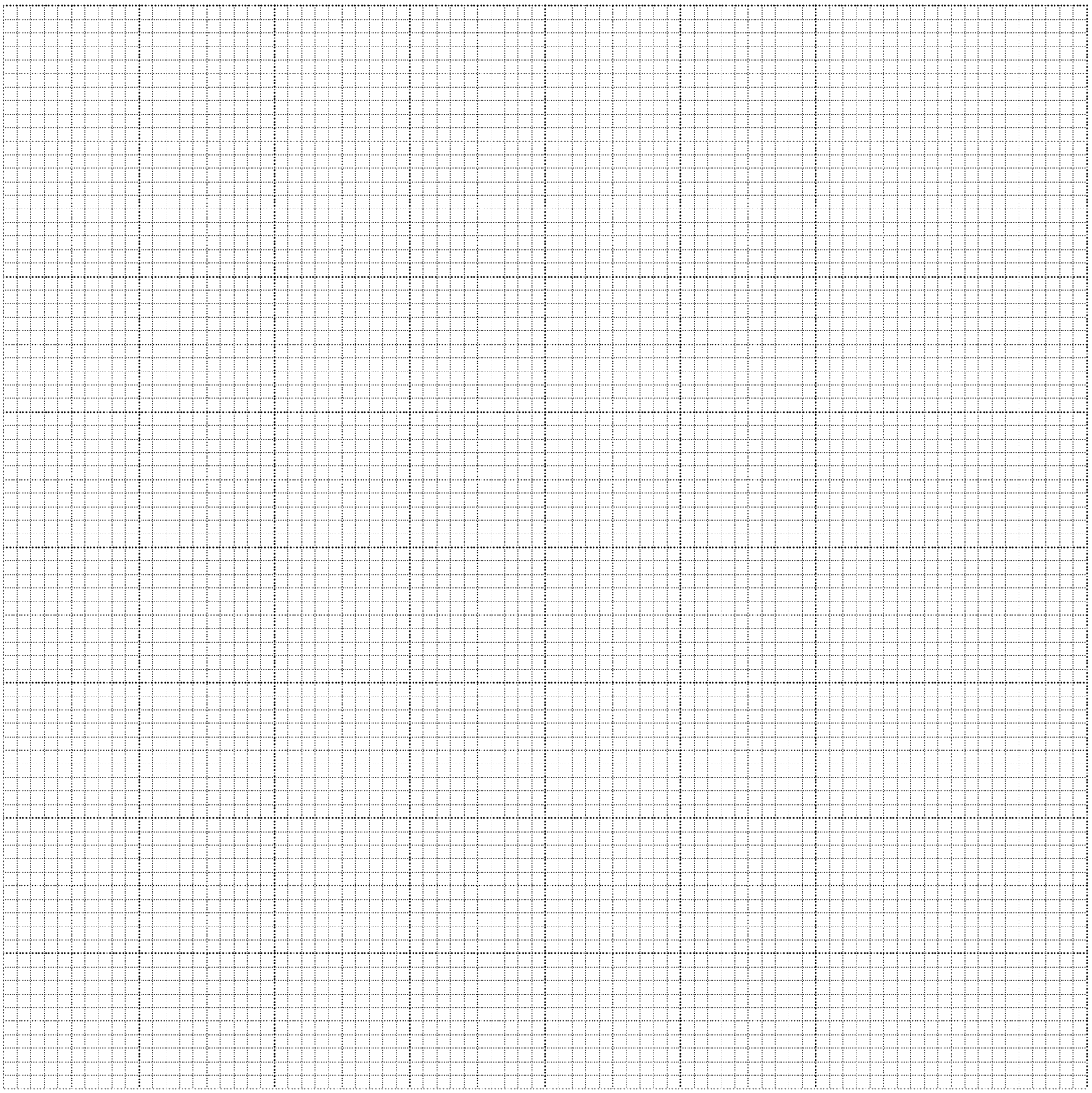
.....[5]

(e) The sugar content of the green pepper and four other types of fresh fruit is shown in Table 1.2.

Table 1.2

type of fresh fruit	sugar content / g per 100 g
banana	15.0
green pepper	2.7
lemon	3.5
orange	9.0
tomato	2.0

(i) Plot a graph of the data in Table 1.2 to compare the sugar content of the five fruits.



[4]

(ii) Calculate how many times more sugar can be found in 100 g of banana compared to 100 g of green pepper.

Show your working.
Give your answer to the nearest whole number.

[2]

[Total: 18]

2 Fig. 2.1 shows a section through a carrot, *Daucus carota*.

Fig. 2.1

(a) Make a large drawing of the carrot to show:

- the number of layers
- the thickness of the layers.

Label where the leaves are attached.

[4]

(b) The carrot is an example of a storage organ.

Describe how you would carry out a test to show the presence of starch in this storage organ.

.....

.....

.....

.....

.....[2]

(c) Carrot plants produce storage organs in their first year. These are used in their second year to produce flowers and seeds.

Fig. 2.2 shows three carrot seeds as seen under a light microscope.

Fig. 2.2

You are going to calculate the magnification of Fig. 2.2.

Measure the length of line **ST** drawn on one of the seeds in Fig. 2.2.

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

The scale rule shows 10 mm, divided into 100 divisions, each of 0.1 mm. Use the scale rule to measure the actual width of the seed marked by line **ST**.

actual width of seed, marked by **ST** (using scale rule) ..... mm.

Calculate the magnification of Fig. 2.2.

Show your working.

Give your answer to the nearest whole number.

magnification × .....[4]

(d) Some students wanted to investigate the conditions needed for the germination of carrot seeds.

As part of their plan, they listed the conditions shown in Fig. 2.3.

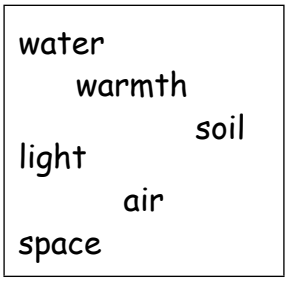


Fig. 2.3

One student selected light as a factor and suggested a plan for an investigation into the effect of light on germination.

- Samples of 15 soaked seeds were left to germinate in each of two open dishes.
- One dish was covered with black paper and the other dish was left uncovered.
- Both dishes were placed on a window bench for three days.
- Most seeds germinated successfully.

(i) Give a conclusion that the student could make from this investigation.

.....

.....

.....[1]

(ii) Describe one improvement that the student could make to their method.

.....

.....

.....[1]

[Total: 12]

3 Fig. 3.1 shows a male and a female fly of the same species.

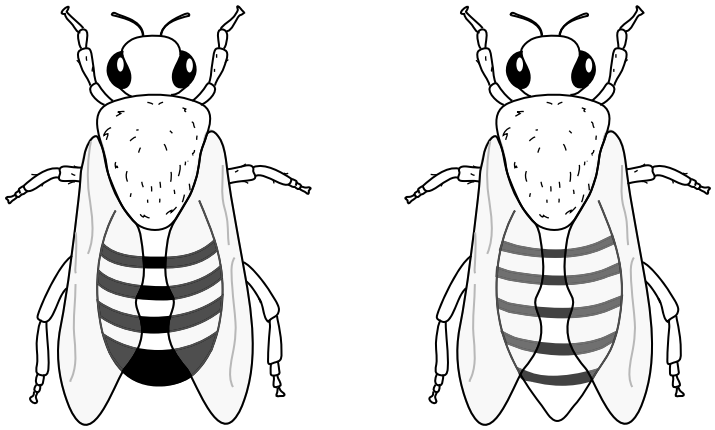


Fig. 3.1

(a) Describe **two** differences, **visible** in Fig. 3.1, between the male and female fly.

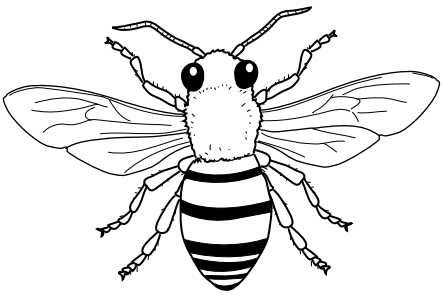
Complete Table 3.1 to record these differences.

Table 3.1

feature	male	female

[3]

(b) Fig. 3.2 shows a different type of insect, a bee.



not drawn to scale

Fig. 3.2

Insects can be recognised by having three parts to the body and three pairs of legs, amongst other features.

Describe **two other** features, visible in Fig. 3.1 **and** Fig. 3.2 that show that the fly and the bee are both identified as insects.

1 .....

2 .....[2]

(c) Both flies and bees are attracted to coloured flowers.

Suggest how you could find out which colours attract more bees than flies.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[5]

[Total: 10]

BLANK PAGE