Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0090021815 0

BIOLOGY **0610/53**

Paper 5 Practical Test **May/June 2014**

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 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.

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 **8** printed pages.

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

1 The enzyme lipase breaks down fats into fatty acids and glycerol.
You are going to investigate how temperature affects the break down of the fats in milk using lipase.
You are going to use a pH indicator, bromothymol blue, and observe the colour every minute for a total time of 10 minutes.

Table 1.1 shows the colour changes of this indicator.

Table 1.1

pH	6	7	8
colour	yellow	green	blue

- You have three containers labelled **cold**, **warm** and **hot**, each containing a test-tube.
- Use a dropping pipette to put 5 drops of bromothymol blue indicator into each test-tube.
- Use a syringe to add 1 cm^3 of sodium carbonate solution to each test-tube.
- Use a clean syringe to add 2 cm^3 of milk to each test-tube.
- Label **another** three test-tubes **lipase.** Place one in each of the containers labelled **cold**, **warm** and **hot**.
- Use a clean syringe to add 3 cm^3 of lipase to each test-tube labelled lipase.
- Raise your hand when you are ready for hot water to be added to the container labelled **hot**.
- Use the thermometer to measure the temperature in each container.

Record the temperatures in Table 1.2.

Leave the experiment for 5 minutes. Continue with Question 1(b).

- After 5 minutes, pour the lipase from the test-tube labelled **lipase** in the **cold** container into the other test-tube in the **cold** container. Shake the test-tube to mix the liquids.

  Repeat this process for the **warm** container and the **hot** container.

(a) Observe the colour of the bromothymol blue indicator every minute for 10 minutes. Record the colours in Table 1.2.

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Table 1.2

time / min	colour of indicator		
	cold .....°C	warm .....°C	hot .....°C
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

[6]

(b) (i) Sodium carbonate solution has a pH of 8. Suggest why sodium carbonate solution was added to the milk in this investigation.

.....

.....[1]

(ii) State why the two test-tubes in each of the labelled containers were left for 5 minutes before mixing their contents.

.....

.....[1]

(iii) Explain why the colour of the bromothymol blue indicator changed during the investigation.

.....

.....

.....

.....[2]

(iv) Predict the colour change that you would observe if the experiment had been repeated using water at 80 °C.

Explain your answer.

.....

.....[2]

(c) State **two** variables that have been controlled in the experiment you have carried out.

For each of these variables, describe how it has been controlled.

1 variable .....

how it has been controlled .....

.....

2 variable .....

how it has been controlled .....

.....[4]

(d) Suggest **two** ways to modify this investigation to find the optimum (best) temperature for the enzyme lipase to break down the fats in milk.

1 .....

.....

2 .....

.....[2]

[Total: 18]

2 The species of plant *Musa acuminata* produces banana fruits.

You are provided with a covered piece of a banana on a white tile.

(a) (i) Cut a slice from the banana, approximately 1 cm thick, as shown in Fig. 2.1.

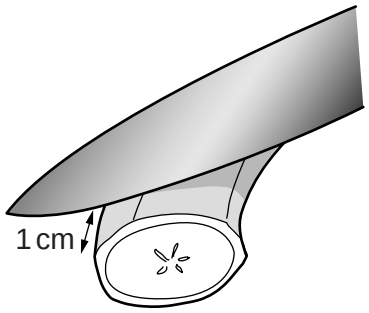


Fig. 2.1

Make a large drawing of the freshly cut surface of the banana to show:

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

Label the region where seeds may develop.

[5]

(ii) Measure the distance across the diameter of the freshly cut slice of the banana and record your result. Include the unit.

diameter of the banana .....

Draw a line across the diameter of your drawing, measure the distance and record your result. Include the unit.

diameter of the drawing of the banana.....[2]

(iii) Calculate the magnification of your drawing.

Show your working.

magnification × .....[2]

(b) (i) Add five drops of iodine solution to the cut surface of the banana.

Make sure the iodine solution spreads evenly and observe the colours.

On your drawing of the cut surface of the banana, label the **colour** of each of the different layers that you have drawn. [2]

(ii) Use your observations to state where starch is stored in the banana.

.....

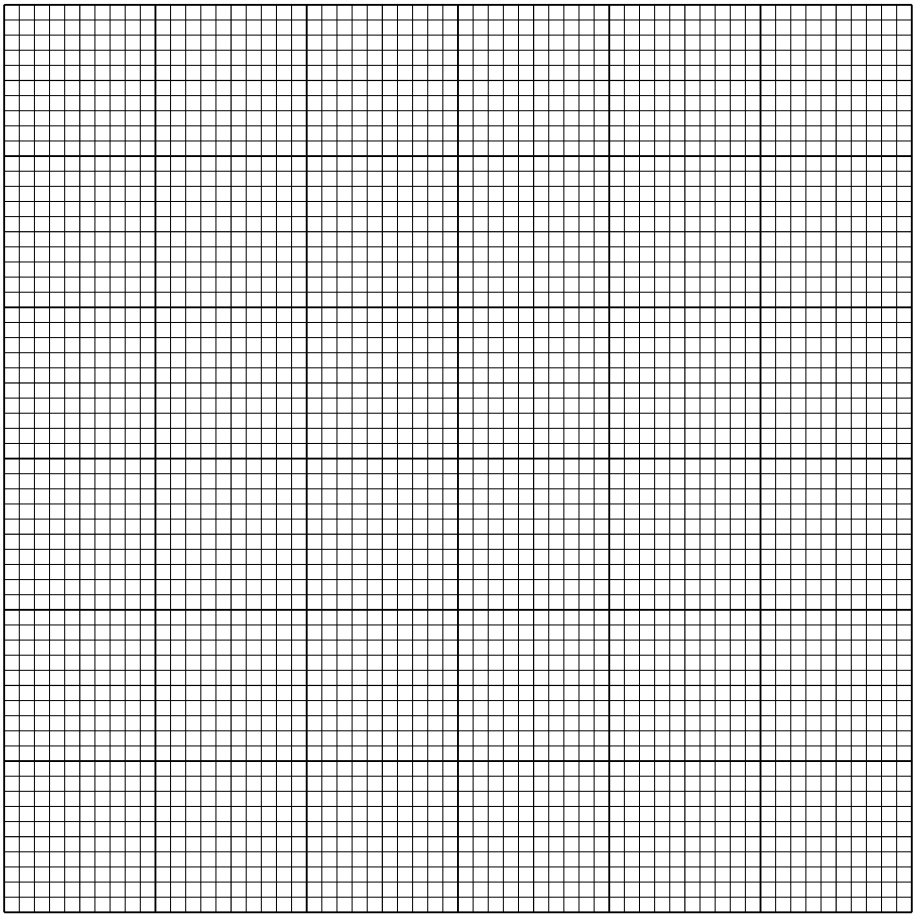
.....[1]

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(c) Some students collected food packaging labels to find the nutrients present in bananas. The table below is a summary of their findings.

nutrient	mass / g per 100 g
carbohydrate	22.25
fat	0.25
protein	2.00
fibre	2.50

(i) Plot a bar chart of the data.



[4]

(ii) The remaining mass of a banana is mostly water, as the mass of vitamins and minerals is very small.

Calculate, to the nearest whole number, the mass of water in 100 g of banana.

Show your working.

.....g [2]

(d) In another investigation, students kept unripe bananas at room temperature for seven days. They studied some of the changes during ripening.

Each day the students took one banana and:

- observed the colour of the banana skin;
- removed a sample of the flesh tissue and determined the reducing sugar content.

The table below shows their results.

time / days	change during ripening	
	skin colour	reducing sugar content / %
1	green	5
2	green and yellow	12
3	mostly yellow	18
4	all yellow	25
5	yellow, some brown	29
6	yellow and brown	30
7	mostly brown	30

(i) The reducing sugar content increased as the bananas ripened.

Calculate how many times greater was the sugar content on day 6 compared with day 1.

Show your working.

.....[2]

(ii) Suggest the source of the reducing sugar.

.....

.....[1]

(iii) Animals eat wild bananas and spread the seeds in their faeces.
Suggest **one** feature of ripe bananas that attracts animals.

.....

.....[1]

[Total: 22]

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