Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9662444334

BIOLOGY **0610/51**

Paper 5 Practical Test **May/June 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 **10** printed pages and **2** blank pages.

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

1 You are provided with part of a citrus fruit.

- Remove the plastic film and place the fruit on the white tile to show the cut surface.

(a) Make a large, labelled drawing of the cut surface of this fruit to show the internal structure.

[4]

Juice can be extracted from fruits on a commercial scale. This process uses an enzyme to digest part of the plant structure to release a larger volume of juice.

You are going to investigate the effect of pH on this enzyme when it is added to a sample of fresh fruit.

You will be using buffer solutions to change the pH.

- Dip a piece of Universal Indicator paper into **buffer X**.
- Repeat for **buffer Y** using another piece of Universal Indicator paper.

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(b) (i) Observe and record the colour of these pieces of Universal Indicator paper after they have been placed in the buffer solutions.

buffer X .....

buffer Y .....

[1]

(ii) Use the colour chart provided to determine the pH of **buffer X** and **Y**.

pH of **buffer X** ..... pH of **buffer Y** .....

[1]

- Label four empty cups, **A1**, **B1**, **C1**, and **D1**.
- Add 25 cm^3 of crushed fruit to each of the four labelled cups.

You are provided with four beakers labelled **water**, **enzyme**, **buffer X** and **buffer Y**.

- Use the syringes to add the volumes of contents shown in Table 1.1 to the crushed fruit in each of the cups.

Table 1.1

contents	volume of contents added / cm^3			
	A1	**B1**	**C1**	**D1**
crushed fruit	25	25	25	25
buffer X	5	5	–	–
buffer Y	–	–	5	5
water	2	–	2	–
enzyme	–	2	–	2

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Leave cups **A1**, **B1**, **C1** and **D1** to stand for 10 minutes and proceed with the later questions.

- Label four empty cups, **A2**, **B2**, **C2** and **D2**.
- Place one filter paper into each of the cups.

Spoon the mixture from cup **A1** into the filter paper placed into cup **A2** as shown in Fig. 1.2.

Repeat the procedure for cups **B1**, **C1** and **D1**.

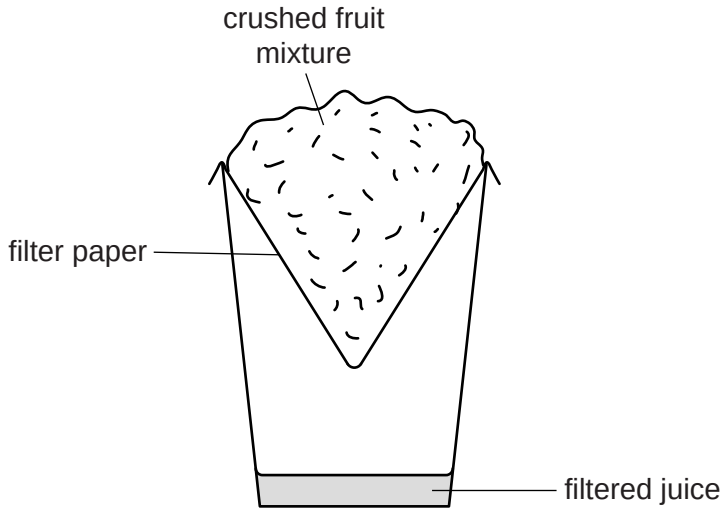


Fig. 1.2

Record the time. .....

Leave the mixtures in cups **A2**, **B2**, **C2** and **D2** to filter for **10 minutes** and proceed with later questions.

- After 10 minutes, remove the filter paper and remaining crushed fruit mixture within it.
- Measure the volume of filtered juice in cups **A2**, **B2**, **C2** and **D2**.

(c) Complete Table 1.2 by recording:

- the units in the appropriate place
- the volume of juice filtered in each cup.

Table 1.2

volume of juice filtered / ……..			
A2	**B2**	**C2**	**D2**
…….	…….	……..	…….

[4]

(d) Compare the volumes and describe the appearance of the filtered juice in cups:

(i) **A2** and **B2**

.....

.....

.....

.....

.....[2]

(ii) **C2** and **D2**.

.....

.....

.....

.....

.....[2]

(e) Describe the effect of pH on the enzyme by comparing the volumes and the appearance of the filtered juice in cups **B2** and **D2**.

.....

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.....

.....[3]

(f) **(i)** Suggest why water was added to cups **A1** and **C1**.

.....

.....

.....[1]

(ii) State **two** variables that were controlled in this investigation.

1 .....

2 .....

[2]

(iii) Suggest **two** ways in which you could modify this investigation to produce more accurate results.

1 .....

.....

2 .....

.....

[2]

[Total: 22]

2 The heart pumps blood to the body through the arteries. The rate of blood flow can be determined at certain sites around the body as a pulse. This can be used to estimate the heart rate.

(a) (i) On Fig. 2.1, label **two** sites where you can feel a pulse.

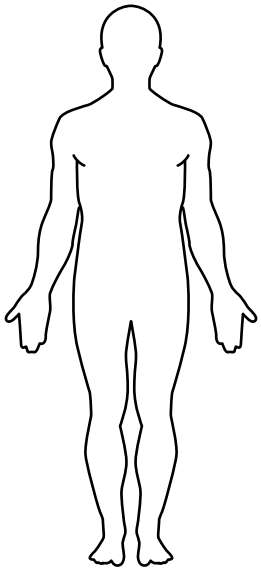


Fig. 2.1

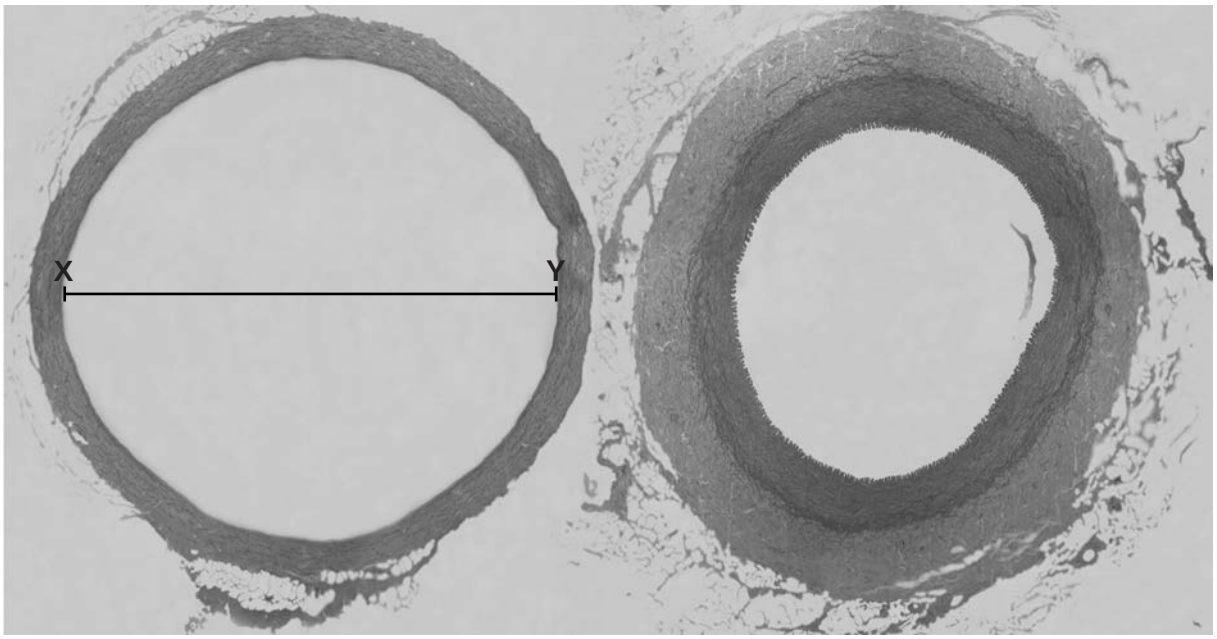
[2]

(ii) Suggest **one** feature of these sites that makes it possible to feel a pulse.

.....

.....[1]

(b) Fig. 2.2. shows a section through two blood vessels, a vein and an artery, as seen on a prepared slide when viewed with the use of a microscope.



× 125

vein **artery**

Fig. 2.2

The diameter of the blood vessel in Fig. 2.2, shown by line **XY**, can be calculated using:

$$\text{diameter} = \frac{\text{measured length of line } \mathbf{XY} \text{ on image}}{\text{magnification}}$$

(i) Measure, in mm, the length of line **XY** on Fig. 2.2.

measured length of **XY** ..... mm [1]

(ii) Use the information above and your answer to **(i)** to calculate the diameter shown by line **XY**, in mm.

Show your working. Give your answer to one decimal place.

diameter ..... mm [1]

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(iii) The length of **XY** may not be the most accurate measurement of the diameter of the blood vessel in Fig. 2.2.

Suggest how you could determine a more accurate measurement of the diameter.

.....

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.....

.....[2]

(iv) The vein and artery in Fig. 2.2 have features that are different.

Complete Table 2.1 to name **three** features that are different and describe the differences that you can observe in Fig. 2.2.

Table 2.1

feature	vein	artery
.....	.....	.....
	.....	.....
.....	.....	.....
	.....	.....
.....	.....	.....
	.....	.....

[4]

(c) When running the heart rate increases. After running the heart rate returns to normal.

(i) Plan an investigation to compare the increase in heart rate as a result of exercise for students that take regular exercise with those that do not.

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.....[4]

(ii) Draw a suitable table with headings and units to show how you would record the measurements.

[3]

[Total: 18]

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