Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

1715045242

BIOLOGY **0610/61**

Paper 6 Alternative to Practical **May/June 2015**

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 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.

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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1 Fig. 1.1 shows part of an orange.



Fig. 1.1

(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.

The juice of citrus fruits, such as the orange, is acidic.

Students investigated the effect of pH on the activity of this enzyme.

Buffer solutions **X** and **Y** were used to change the pH.

Pieces of Universal Indicator paper were used to test the pH of buffer solutions **X** and **Y**.

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(b) Observe the shade of the pieces of Universal Indicator paper shown in Fig. 1.2 and estimate the pH by comparing with the chart.

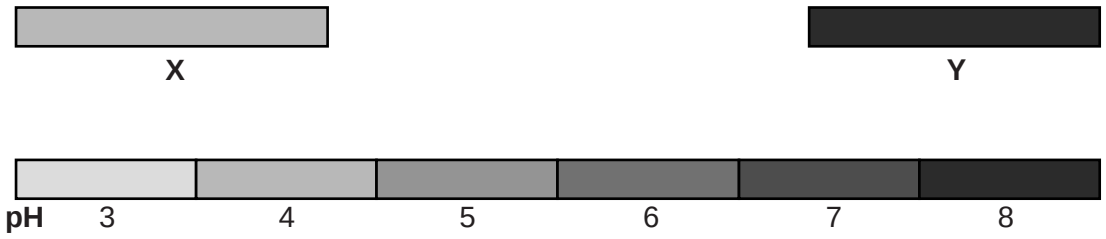


Fig. 1.2

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

[2]

Four plastic cups **A**, **B**, **C** and **D** were set up as shown in Table 1.1.

Table 1.1

contents	volume of contents added / cm^3			
	A	**B**	**C**	**D**
crushed fruit	25	25	25	25
buffer **X**	5	5	–	–
buffer **Y**	–	–	5	5
water	2	–	2	–
enzyme	–	2	–	2

(c) Suggest why water was added to cups **A** and **C**.

.....

.....

.....[1]

The contents of plastic cups **A**, **B**, **C** and **D** were stirred and left to stand for 10 minutes. The contents were then filtered into measuring cylinders.

The results are shown in Fig. 1.3.

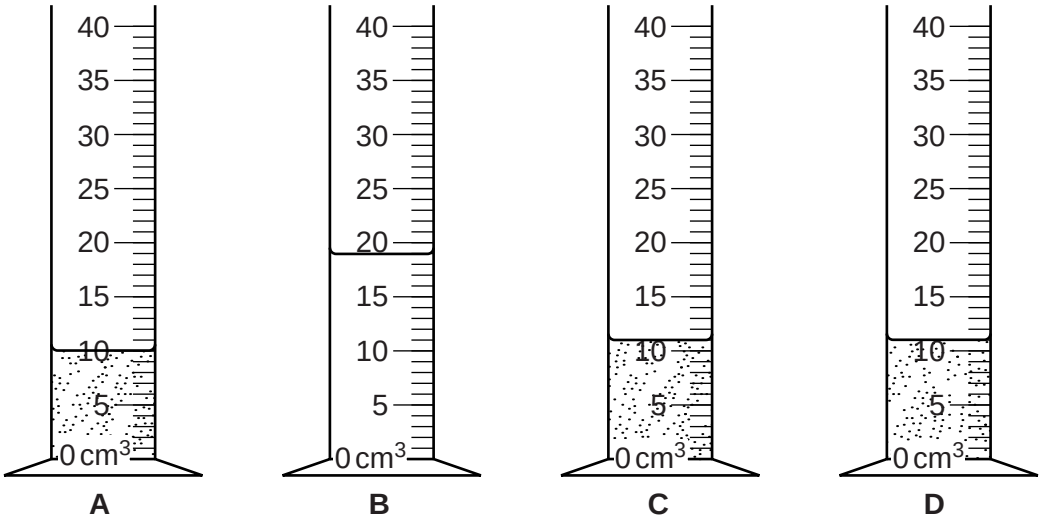


Fig. 1.3

(d) Complete Table 1.2 by recording:

- the units in the appropriate place
- the volume of filtered juice shown in Fig. 1.3.

Table 1.2

volume of juice filtered / ……..			
A	**B**	**C**	**D**
…….	…….	……..	…….

[2]

(e) Compare the volumes and describe the appearance of the filtered juice in measuring cylinders:

(i) **A** and **B**

.....

.....

.....

.....

.....[2]

(ii) **C** and **D**.

.....

.....

.....

.....

.....[2]

(f) Describe the effect of pH on the enzyme by comparing the volumes and the appearance of the filtered juice in measuring cylinders **B** and **D**.

.....

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.....

.....[3]

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

1 .....

2 .....
[2]

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

1 .....

.....

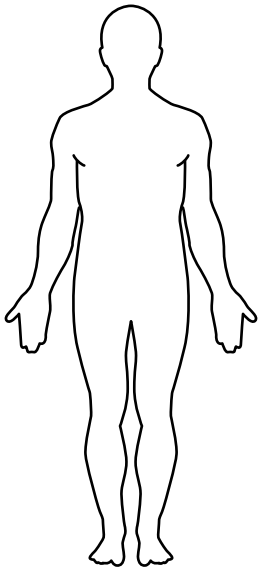
2 .....

.....
[2]

[Total: 20]

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.



[2]

Fig. 2.1

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

.....

.....[1]

(b) Describe how you could measure the pulse and use this to estimate the heart rate.

.....

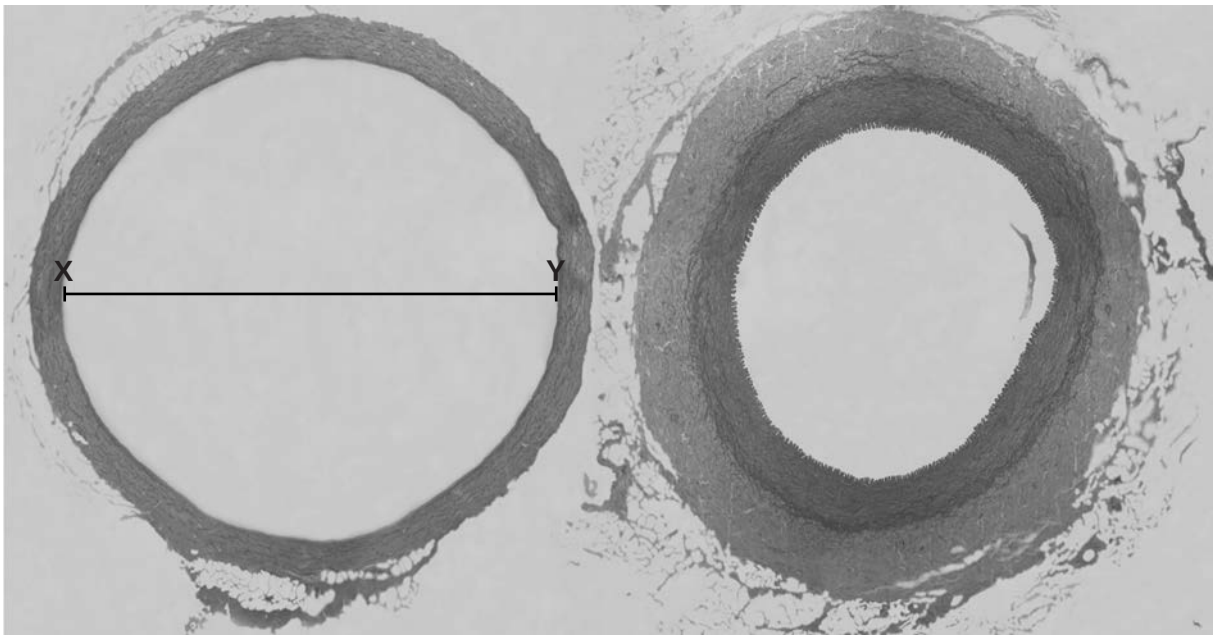
.....

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.....

.....[2]

(c) 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.

.....

.....

.....

.....

.....[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]

(d) 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 who take regular exercise with those who 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: 20]

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