UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

9282687787

BIOLOGY **0610/21**

Paper 2 Core **October/November 2012**

1 hour 15 minutes

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.

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1	
2	
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4	
5	
6	
7	
8	
9	
Total	

This document consists of **17** printed pages and **3** blank pages.

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1 Vertebrate animals are grouped into a number of **classes**.

Complete the sentences by naming each of the vertebrate classes that are described.

(a) A vertebrate with scaly skin and no legs could be either a .....

or a ..... [2]

(b) A vertebrate with lungs and hair is a ..... but if it has feathers instead of hair it is a ..... [2]

[Total: 4]

2 Fig. 2.1 shows a section through the eye of a small mammal as viewed with a microscope.

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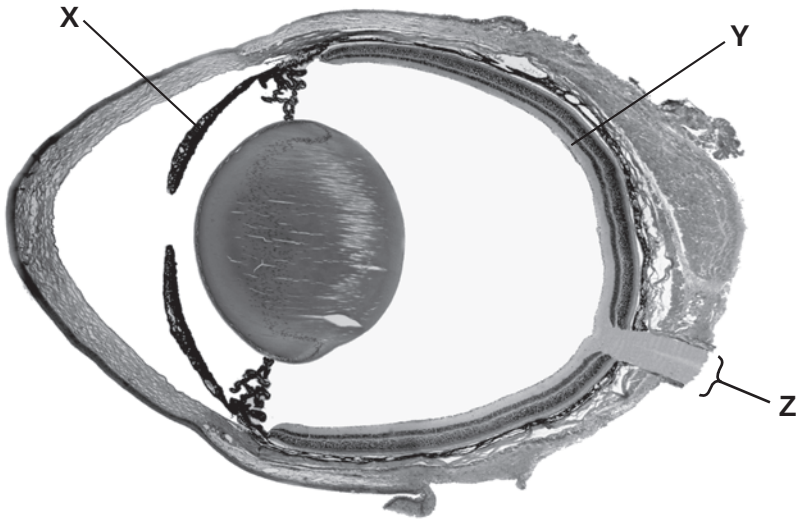


Fig. 2.1

(a) Name the structures labelled **X**, **Y** and **Z**.

X .....

Y .....

Z ..... [3]

(b) A student looks at a clock at the far end of an examination room and then looks at a diagram on her examination paper.

Describe the changes that take place in her eyes so that she can focus on the diagram.

.....

.....

.....

.....

.....

.....

.....

..... [4]

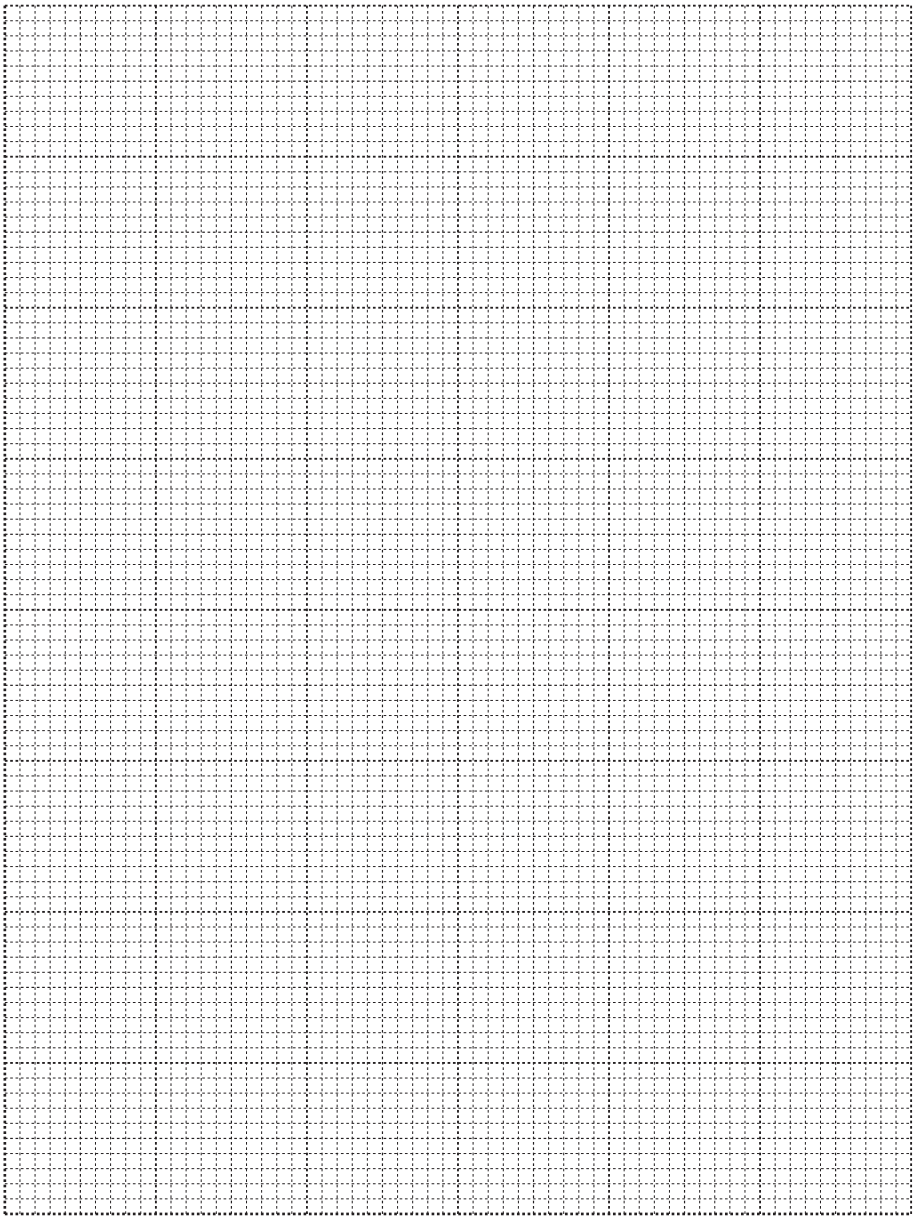
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(c) The shortest distance from the eye at which a clear focus is possible is known as the near point. As a person gets older this distance changes.

Table 2.1 shows the near point for people of different ages who have normal vision.

Table 2.1

age / years	distance of near point / cm
10	7.0
15	8.5
20	10.0
25	12.5
40	22.0
50	40.0
60	80.0



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(i) Plot the data in Table 2.1 on the grid. [4]

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(ii) Use the graph to estimate the distance of the near point for a 30 year old person.

..... [1]

(iii) Use the graph to estimate the age of a person whose near point is 32.0 cm.

..... [1]

[Total: 13]

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3 Fig. 3.1 shows an external view of the heart.

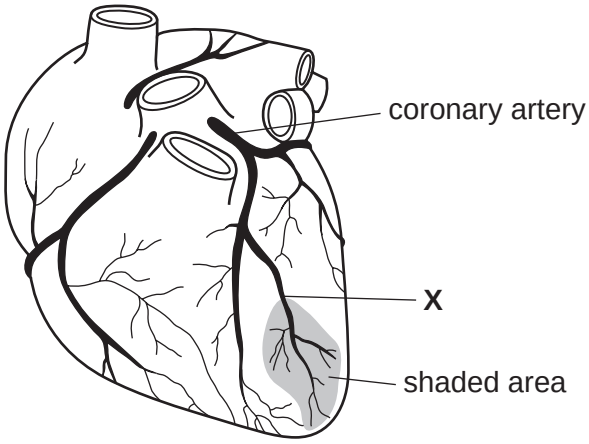


Fig. 3.1

(a) A blood clot is stuck at **X**. Explain what will happen to the heart muscle cells in the shaded area on Fig. 3.1.

.....

.....

.....

.....

.....

..... [3]

(b) List **three** actions people can take to reduce the risk of having a blood clot in the coronary arteries.

1 .....

.....

2 .....

.....

3 .....

..... [3]

[Total: 6]

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4 Fig. 4.1 shows a section along a pea pod, the fruit of a pea plant.

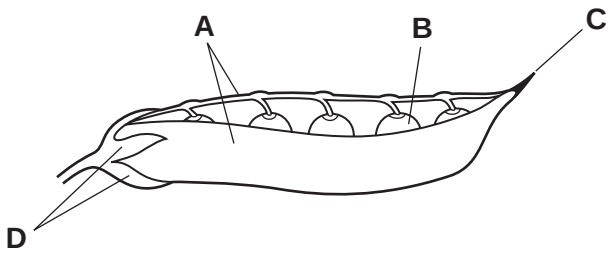


Fig. 4.1

(a) (i) Name the parts of the original pea flower from which structures **A** and **B** have developed.

A .....

B ..... [2]

(ii) Parts **C** and **D** are the remains of parts of the pea flower. Suggest which part **C** was and which part **D** was in the original flower.

C .....

D ..... [2]

Fig. 4.2 shows a section through a pea seed.

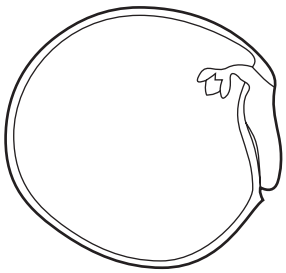


Fig. 4.2

(b) Label, with a label and line on Fig. 4.2 the plumule, the radicle and the testa of this seed.

Put your labels on Fig. 4.2. [3]

(c) State **two** ways in which seeds are dispersed.

1 .....

2 ..... [2]

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(d) Name **three** factors that are essential for all seeds to germinate.

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1 .....

2 .....

3 ..... [3]

[Total: 12]

5 Fig. 5.1 shows a carbon cycle.

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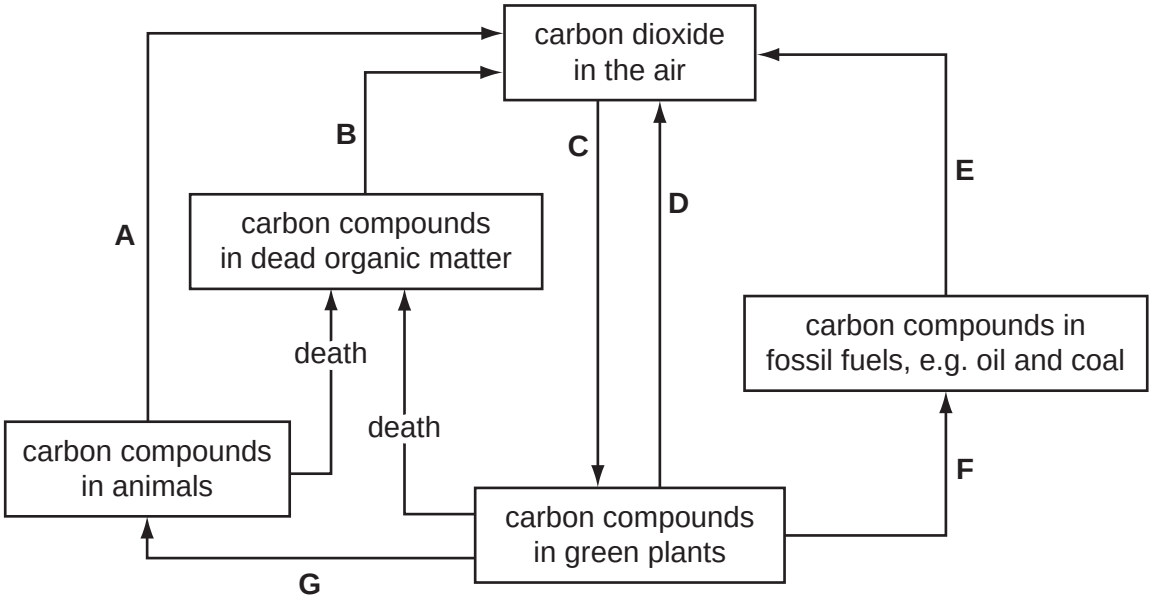


Fig. 5.1

(a) (i) Name the process represented by arrow **A**.

..... [1]

(ii) Name the process represented by arrow **E**.

..... [1]

(b) (i) Name **one** group of organisms responsible for process **B**.

..... [1]

(ii) List **two** environmental conditions needed for process **B** to occur.

1 .....

2 ..... [2]

(c) (i) Which arrow represents photosynthesis?

..... [1]

(ii) Complete the word equation for photosynthesis.

..... + ... ➔ oxygen + ... [2]

(iii) This process needs a supply of energy. Name the form of energy needed.

..... [1]

(d) In an ecosystem the flow of carbon can be drawn as a cycle but the flow of energy cannot be drawn as a cycle.

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Explain this difference.

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

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6 Fig. 6.1 shows the body temperature of a student over a 32 hour period.

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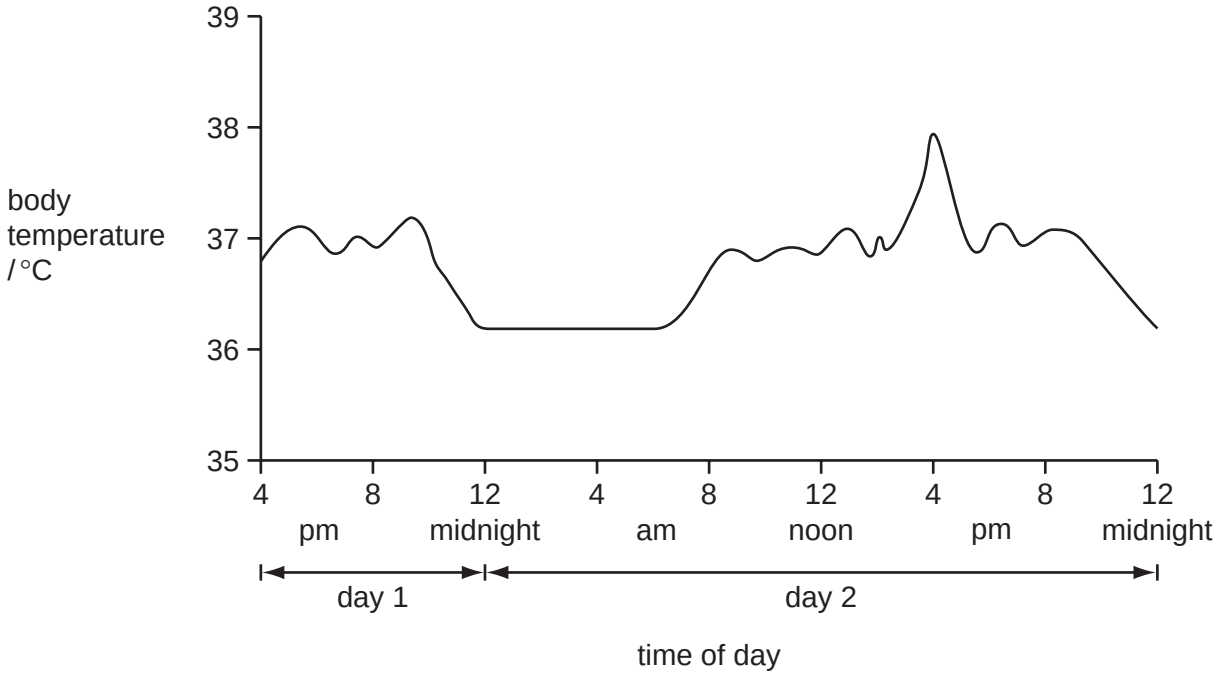


Fig. 6.1

(a) Between 2.30pm and 4.15pm on day 2 the student was involved in gymnastics training.

Explain why the body temperature increased during the training.

.....

.....

.....

..... [2]

(b) The student had a normal body temperature of 36.8 °C. If the body temperature rises above normal, homeostasis takes place.

(i) Define *homeostasis*.

.....

.....

.....

..... [2]

(ii) Explain how sweating can help to change body temperature.

For Examiner's Use

.....

.....

.....

.....

.....

..... [3]

[Total: 7]

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7 Complete the sentences by writing the most appropriate word in each space.

Use **only** words from the box.

allele	diploid	fertilisation	gametes	gene	half
haploid	implantation	meiosis	mitosis	same	

In animals, new cells replace damaged cells. These new cells are formed from existing cells by division. When this happens the nucleus also has to divide. During the process of ..... the nucleus divides into two new nuclei.

These new nuclei contain the two sets of chromosomes, which is the ..... number of chromosomes as the original nucleus. They are described as being ..... .

During the process of ..... a nucleus normally divides into four new nuclei that are not genetically identical. These nuclei contain ..... the number of chromosomes of the original nucleus and are described as ..... .

This type of division produces ..... .

At ..... the original number of chromosomes is restored. [8]

[Total: 8]

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8 Fig. 8.1 shows a cell from the palisade layer of a leaf.

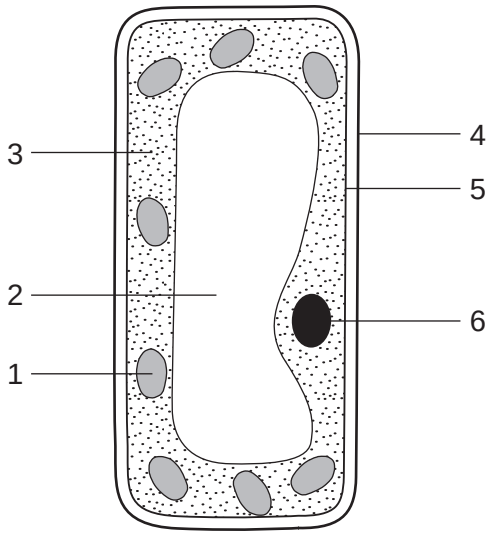


Fig. 8.1

(a) In Table 8.1 tick (✓) the numbers that label the **three** features of the palisade cell which are also found in animal cells.

Table 8.1

label number	present in both animal and plant cells
1	
2	
3	
4	
5	
6	

[3]

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(b) State and describe the function of **two** features of the palisade cell that are **only** found in plant cells.

feature .....

function .....

.....

feature .....

function .....

..... [4]

(c) Fig. 8.2 shows some red blood cells, which are animal cells.

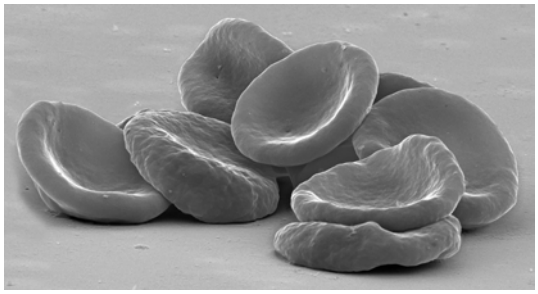


Fig. 8.2

(i) Which feature normally present in an animal cell is absent from a red blood cell?

..... [1]

(ii) State the function of a red blood cell **and** describe **one** way in which the red blood cell is adapted to carry out its function.

.....

.....

.....

..... [2]

[Total: 10]

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[Turn over

9 Fig. 9.1 shows a food web.

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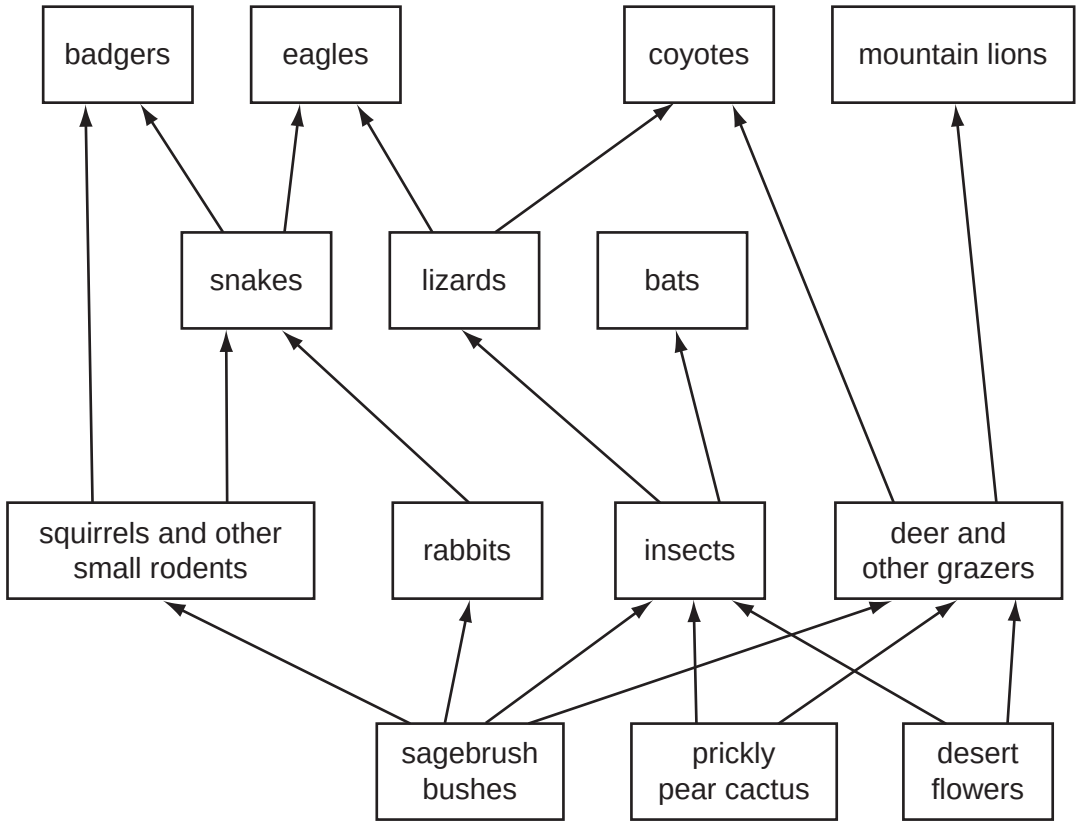


Fig. 9.1

(a) Explain the difference between a food web and a food chain.

.....

.....

.....

..... [2]

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(b) From the food web name:

(i) a carnivore; .....

(ii) a producer; .....

(iii) a consumer from the 2nd trophic level. ..... [3]

(c) In some regions, mountain lions have been hunted and face extinction.

Suggest how the coyotes might be affected if the mountain lion became extinct.

.....

.....

.....

.....

.....

..... [3]

[Total: 8]

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Question 8 Fig. 8.2 © Red Blood Cells; Science Photo Library C0088462

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