



date

Centre Number

Candidate Name \_\_\_\_\_

**International General Certificate of Secondary Education  
CAMBRIDGE INTERNATIONAL EXAMINATIONS  
BIOLOGY  
PAPER 2**

**0610/2**

**OCTOBER/NOVEMBER SESSION 2002**

1 hour

Candidates answer on the question paper.  
No additional materials are required.

**TIME** 1 hour

**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

**INFORMATION FOR CANDIDATES**

The intended number of marks is given in brackets [ ] at the end of each question or part question.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
7	
8	
9	
<b>TOTAL</b>	

1 Fig. 1.1 shows six different fish.

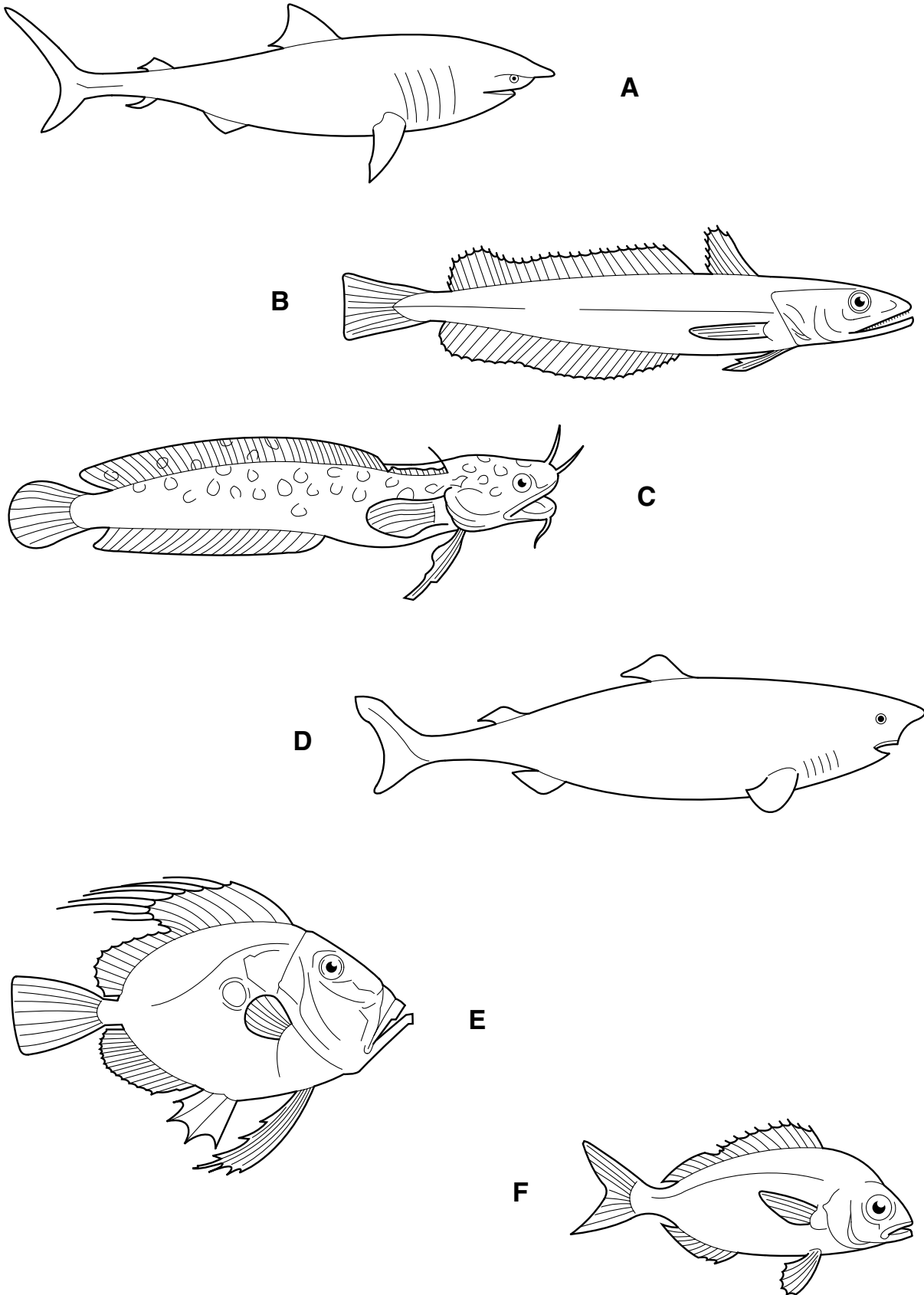


Fig. 1.1

Use the key below to identify each fish. Write the name of each fish in the correct column of Table 1.1. As you work through the key, tick the boxes in Table 1.1. to show how you identified each fish. Fish **A** has been identified for you as an example.

**Key**

		name of fish
<b>1</b>	<b>(a)</b> No gill slits visible	2
	<b>(b)</b> Five gill slits visible	3
<b>2</b>	<b>(a)</b> Body about 7 times as long as deep	4
	<b>(b)</b> Body about 2 times as long as deep	5
<b>3</b>	<b>(a)</b> Eye above front end of mouth	Basking Shark
	<b>(b)</b> Eye above back edge of mouth	Greenland Shark
<b>4</b>	<b>(a)</b> One fin along back	Bearded Rockling
	<b>(b)</b> Two fins along back	Hake
<b>5</b>	<b>(a)</b> Back fin with short spines	Sea Bream
	<b>(b)</b> Back fin with long spines	John Dory

**Table 1.1**

fish	1(a)	1(b)	2(a)	2(b)	3(a)	3(b)	4(a)	4(b)	5(a)	5(b)	name of fish
<b>A</b>		✓			✓						Basking Shark
<b>B</b>											
<b>C</b>											
<b>D</b>											
<b>E</b>											
<b>F</b>											

[Total : 5]

2 (a) The heart pumps blood around the body.

Which chamber of the heart pumps blood to the brain?

..... [1]

(b) The volume of blood pumped to the lungs per minute, the cardiac output, depends on the heart rate and the volume of blood pumped at each beat, the stroke volume.

Table 2.1 shows data for untrained and trained persons at rest and after maximum exercise.

**Table 2.1**

	heart rate (beats per minute)	stroke volume (dm <sup>3</sup> )	cardiac output (dm <sup>3</sup> per minute)
untrained person at rest	75	0.070	
trained person at rest	50	0.105	
untrained person after maximum exercise	195	0.110	21.45
trained person after maximum exercise	180	0.165	29.70

(i) Calculate the cardiac output for the untrained and trained persons at rest.  
Record your answers in Table 2.1. [2]

(ii) Compare the data for the untrained and trained persons at rest.  
State two effects that training has on the activity of the heart.  
1. ....  
.....  
2. ....  
..... [2]

(iii) Use the data to compare the effect of maximum exercise on trained and untrained persons.  
.....  
.....  
..... [2]

(iv) Suggest how the heart itself benefits from training.

.....  
..... [1]

(c) Explain why the body needs a higher cardiac output during exercise.

.....  
.....  
.....  
.....  
.....  
..... [4]

[Total : 12]

3 When water from treated sewage is released into a river, it can have the same effect as the release of excess fertilisers.

(a) Suggest why the water from treated sewage can have this effect.

.....  
.....  
..... [2]

(b) Describe and explain what might occur to the organisms in the river as the result of such pollution.

.....  
.....  
.....  
.....  
.....  
..... [5]

[Total : 7]

4 Fig. 4.1 shows a food chain and the energy flow through it.

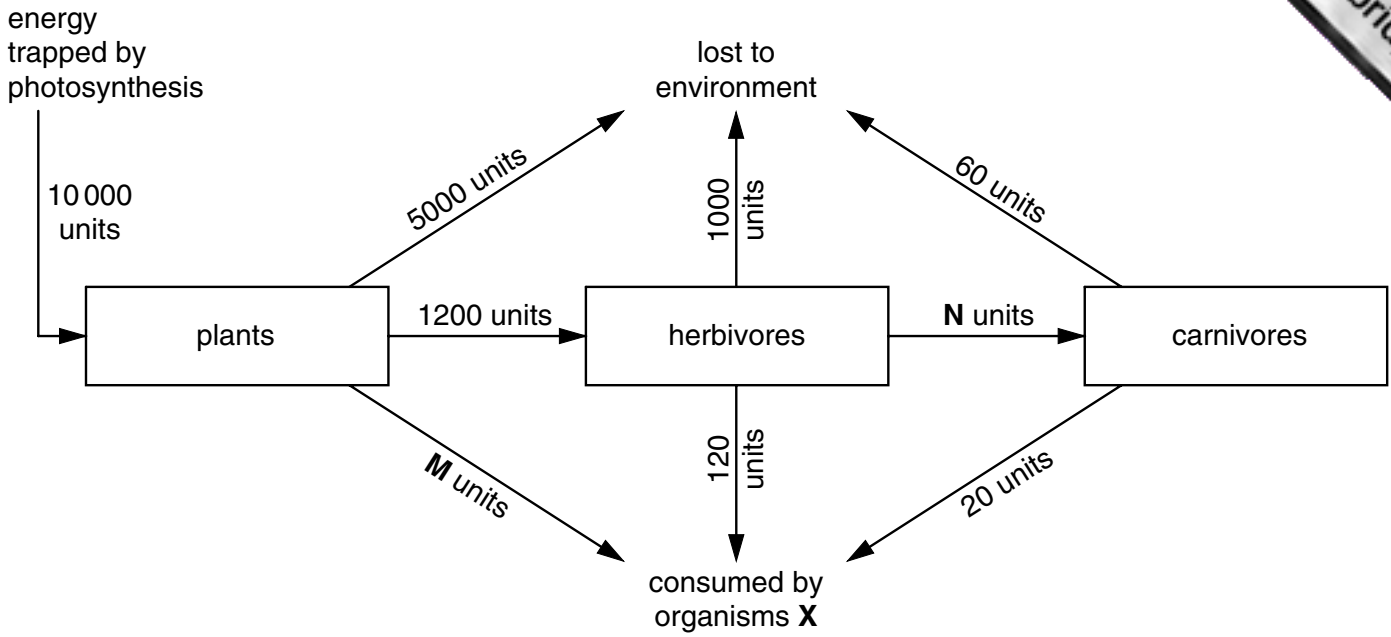


Fig. 4.1

(a) (i) Calculate the energy values M and N.

M .....

N ..... [2]

(ii) To which group of organisms might X belong?

..... [1]

(iii) State the source of energy for this food chain.

..... [1]

(iv) Suggest two processes that might account for the loss of energy from the organisms to the environment.

1. ....

.....

2. ....

..... [2]

(b) The herbivores are mammals. Suggest why they lose to the environment about 90% of the energy they receive, but the plants lose only about 50% of their energy.

.....

.....

.....

..... [2]

[Total : 8]

5 The graph, Fig. 5.1, shows the mean heights of males at various ages.

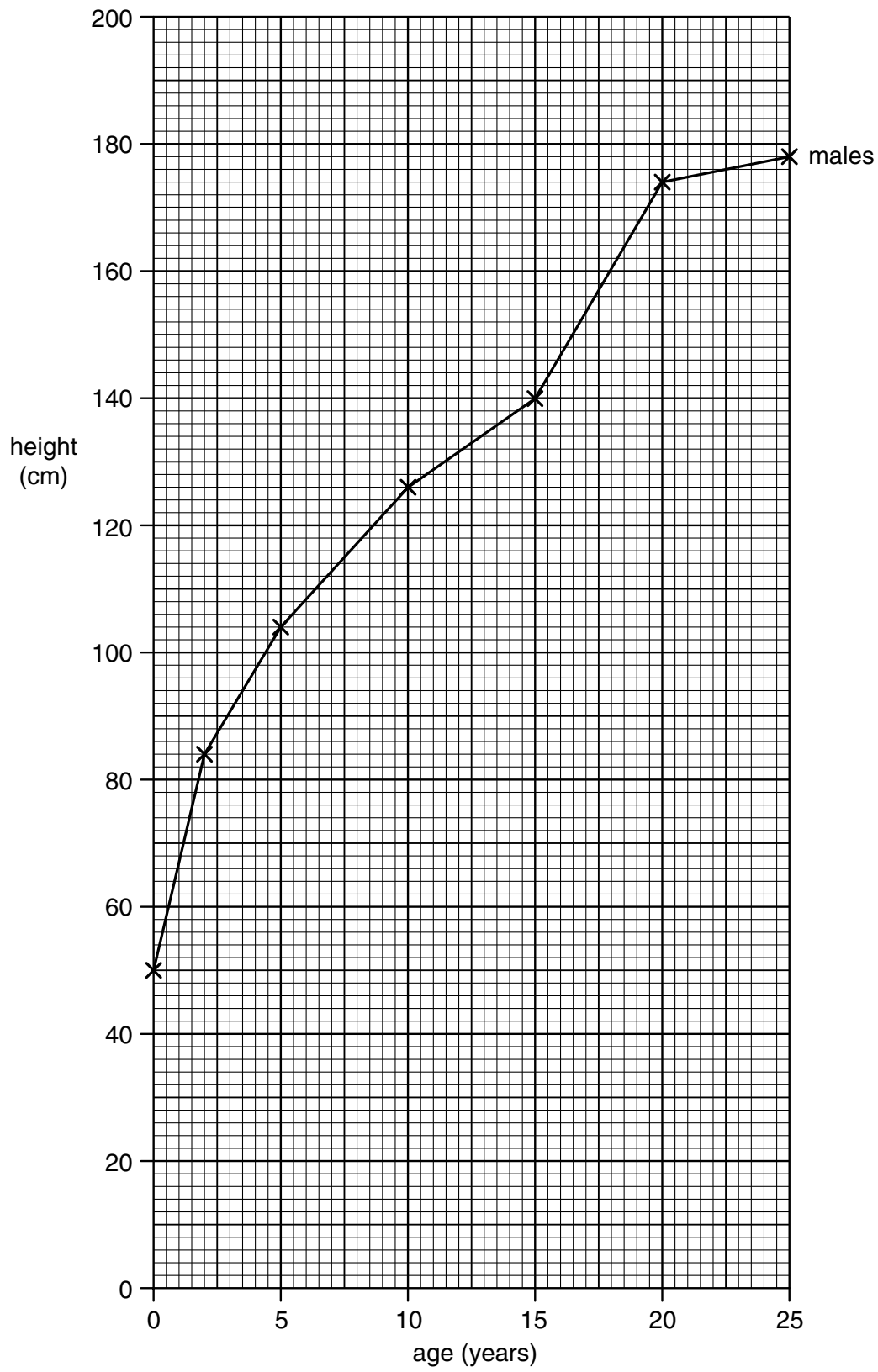


Fig. 5.1



Table 5.1 shows the mean heights of females over the same age range.

**Table 5.1**

age of females (years)	mean height (cm)
0	50
2	84
5	96
10	130
15	144
20	162
25	162

**(a) (i)** Plot these data on Fig. 5.1. [2]

**(ii)** Between which ages is the rate of growth fastest in females?  
..... [1]

**(iii)** Between which ages are females taller than males?  
..... [1]

**(iv)** At what age is the mean height of males 140 cm?  
..... [1]

**(b)** Normally, puberty for females occurs in the early teenage years.

State three changes, other than increase in height or mass, that occur in females during puberty.

1. ....  
.....

2. ....  
.....

3. ....  
..... [3]

[Total : 8]

6 Fig. 6.1 shows the male reproductive system.

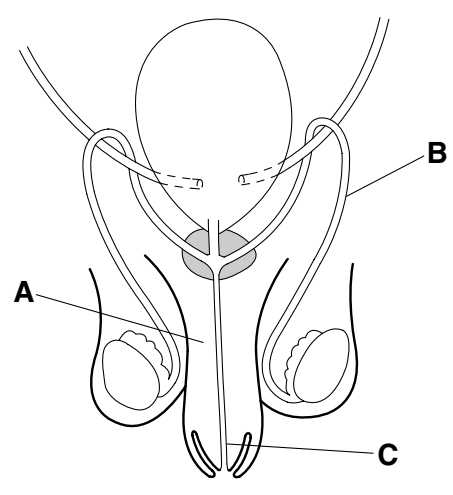


Fig. 6.1

(a) Name the parts labelled **A**, **B** and **C**.

- A** .....
- B** .....
- C** ..... [3]

(b) A disease that can affect the male reproductive system is gonorrhoea.

(i) State two signs or symptoms of this disease in males.

- 1. ....
- .....
- 2. ....
- ..... [2]

(ii) What long-term effect can this disease have in males?

..... [1]

(iii) What is the normal method of treatment for a gonorrhoea infection?

..... [1]

(iv) What is the best method of preventing the spread of this disease during sexual intercourse?

..... [1]

7 (a) (i) Define the term *tissue*.

.....  
..... [1]

(ii) State the two functions of xylem tissue.

1. ....  
.....  
2. ....  
..... [2]

(b) Fig. 7.1 shows some cells in a tissue.

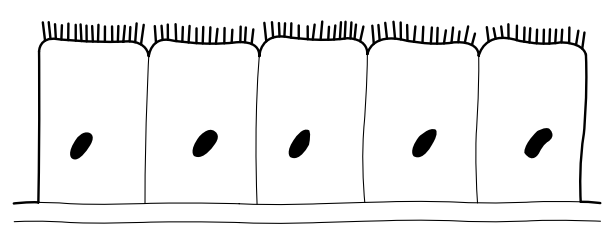


Fig. 7.1

(i) Name this tissue.

..... [1]

(ii) This tissue lines the oviduct.

Suggest its function in this tube.

.....  
..... [1]

(iii) Name another tube that is lined by this tissue.

..... [1]

(iv) Which chemical in cigarettes interferes with the working of this type of tissue?

..... [1]

[Total : 7]

8 Fig. 8.1 shows an apparatus used in an investigation into transpiration. The cylinders set up and left in the same conditions for 24 hours.

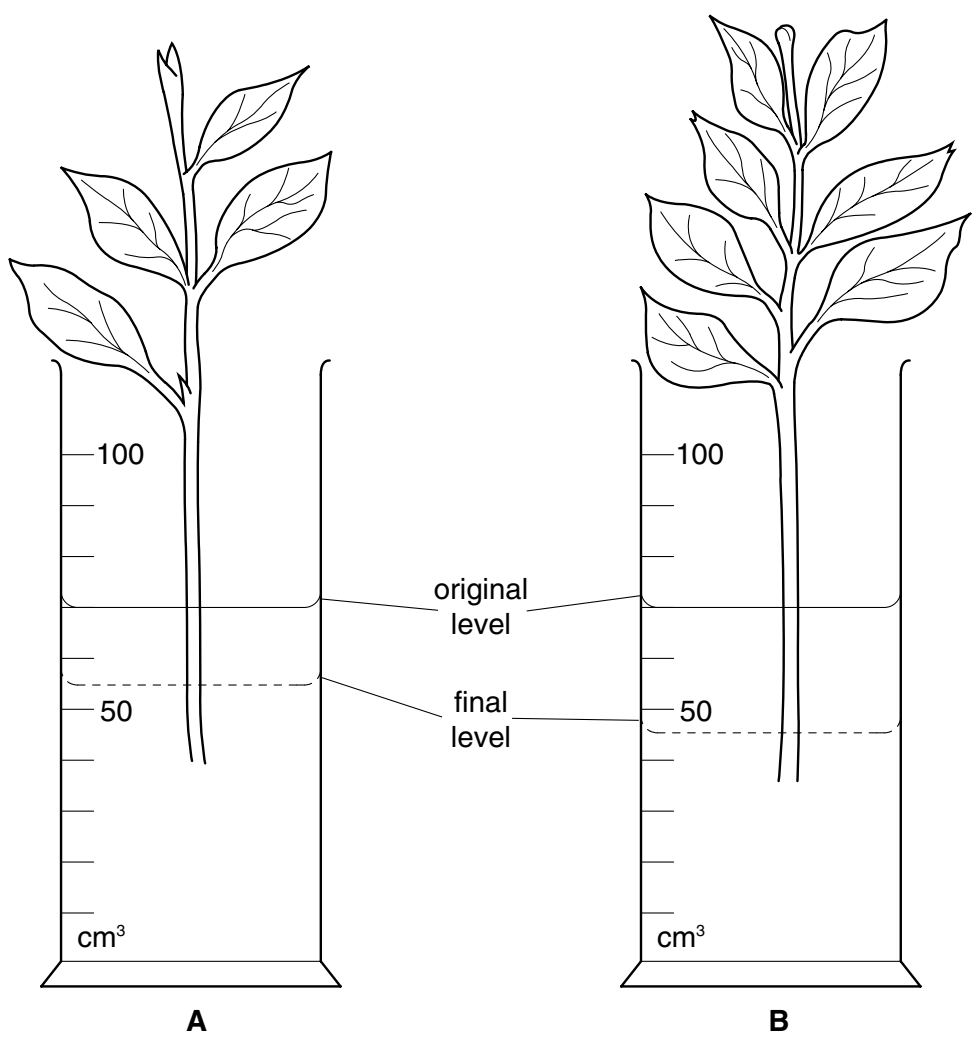


Fig. 8.1

(a) The drop in the level of water in the cylinders is taken as a measure of the rate of transpiration.

(i) Complete Table 8.1.

Table 8.1

	water volume (cm <sup>3</sup> )	
	cylinder A	cylinder B
original volume		
final volume		

[2]

(ii) Which variable could account for the differences in the results for cylinders **A** and **B**?

.....  
..... [1]

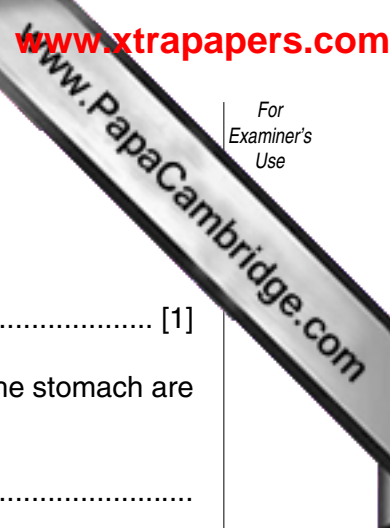
(iii) Suggest a modification you could make to ensure that all the water lost from the cylinders is taken up by the shoots.

.....  
..... [1]

(b) State three environmental factors that can affect the rate of transpiration.

1. ....
2. ....
3. .... [3]

[Total : 7]



9 (a) Proteins are digested in the stomach and small intestine.

(i) Which type of enzyme breaks down proteins?

..... [1]

(ii) State how the conditions necessary for the digestion of proteins in the stomach are different from those in the small intestine.

.....  
..... [1]

(b) When carbohydrates have been digested, excess glucose is stored.

(i) Where is it stored?

..... [1]

(ii) What is it stored as?

..... [1]

(c) Excess amino acids cannot be stored.

Describe how they are removed from the body.

.....  
.....  
.....  
.....  
.....  
.....  
..... [4]

[Total : 8]



---

*Copyright Acknowledgements:*

Question 1 A Lawrence Wells. *Observers Book of Sea Fishes*. Frederick Warne & Co. 1958

Question 2 Dennis Taylor. *Human Physical Health*. Cambridge University Press. 1980

Cambridge International Examinations has made every effort to trace copyright holders, but if we have inadvertently overlooked any we will be pleased to make the necessary arrangements at the first opportunity.