UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

7021514936

BIOLOGY **0610/02**

Paper 2 Core **May/June 2007**

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.

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	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

This document consists of **19** printed pages and **5** blank pages.

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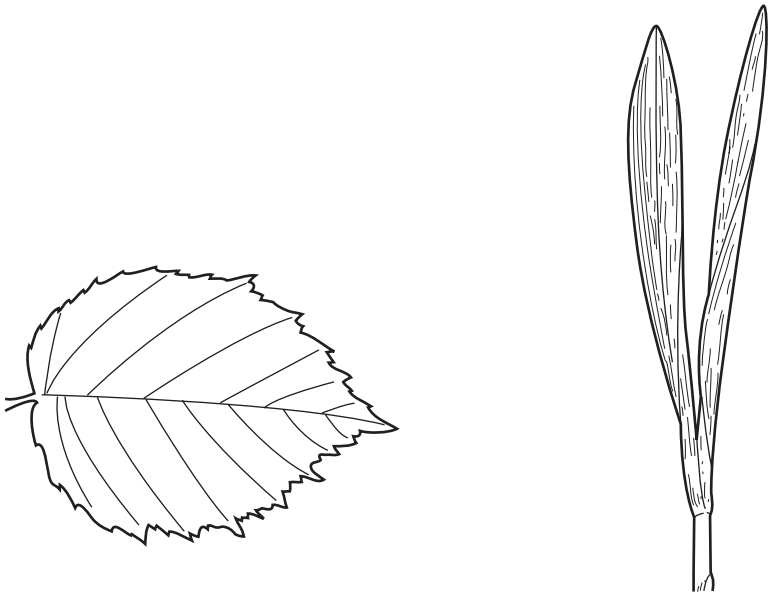
1 **(a)** Figs. 1.1 – 1.4 show organisms or parts of organisms (not drawn to scale).



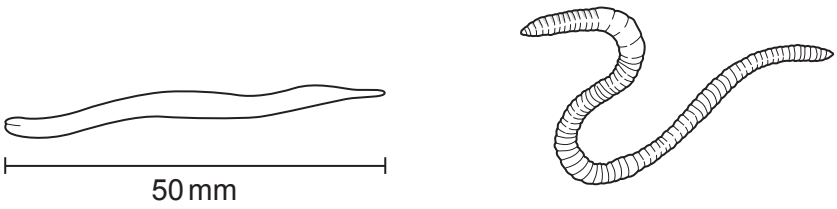
A **B**

Fig. 1.1

(i) State which of the drawings shows a monocotyledon leaf. State **one** reason for your choice.

.....

..... [1]



C **D**

Fig. 1.2

(ii) State which of the drawings shows an annelid. State **one** reason for your choice.

.....

..... [1]

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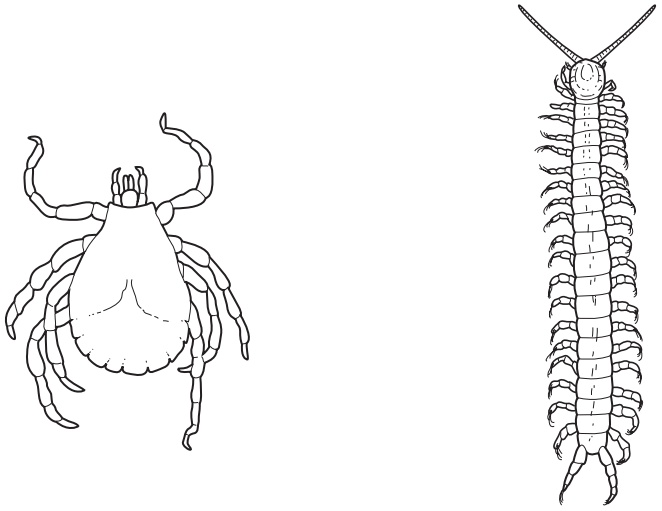


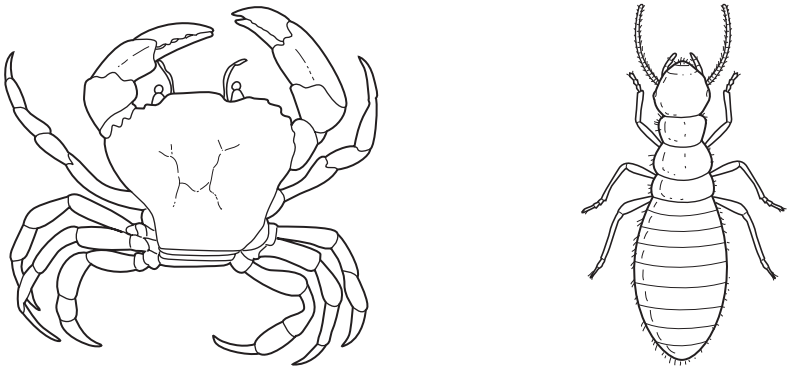
E F

Fig. 1.3

(iii) State which of the drawings shows an arachnid. State **one** reason for your choice.

.....

..... [1]



G H

Fig. 1.4

(iv) State which of the drawings shows a crustacean. State **one** reason for your choice.

.....

..... [1]

(b) The length of the drawing of worm **C**, in Fig. 1.2, is shown. The actual length of the worm is 5 mm. Calculate the magnification of this drawing. Show your working.

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magnification ..... [2]

[Total: 6]

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2 Fig. 2.1 shows a flower of a dicotyledon.

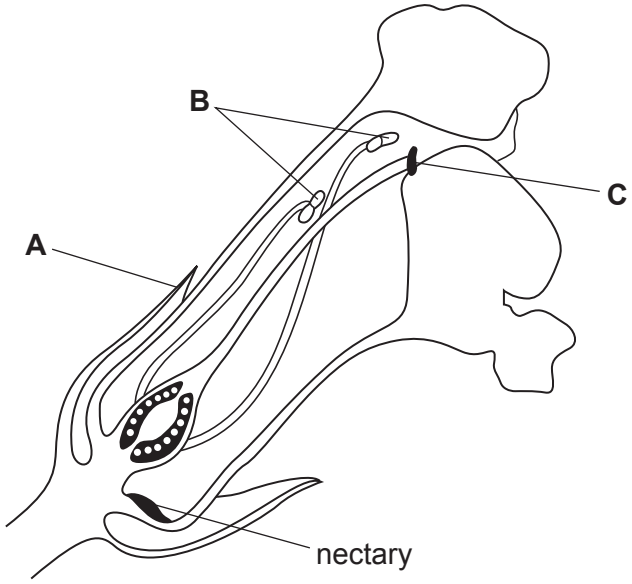

Fig. 2.1

(a) Name parts **A** and **B**, shown on Fig. 2.1.

A .....

B ..... [2]

(b) State the function of part **C**.

.....

..... [1]

(c) The flower shown in Fig. 2.1 is insect pollinated. Describe how two features, visible in Fig. 2.1, would be different in a wind pollinated flower.

1 .....

.....

2 .....

..... [2]

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(d) Complete Table 2.1 by placing a tick (✓) in the boxes to show which processes happen during the reproduction of flowering plants and which happen during the reproduction of humans.

Table 2.1

process	flowering plants	humans
fertilisation		
germination		
implantation		
pollination		
sexual intercourse		

[2]

(e) (i) While visiting a new region of forest a student found an unknown plant.

Hanging from it were some structures with bright red outer coverings.

These contained some soft fleshy tissue. In this tissue were many seeds with hard outer coats.

Suggest, with reasons, how these seeds might be dispersed.

method of dispersal .....

reasons .....

.....

..... [3]

(ii) Suggest which conditions in the forest would allow these seeds to germinate and grow into young plants.

.....

.....

.....

..... [3]

[Total: 13]

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3 **(a)** Fig. 3.1 shows the variation in the height of human adults in an African population.

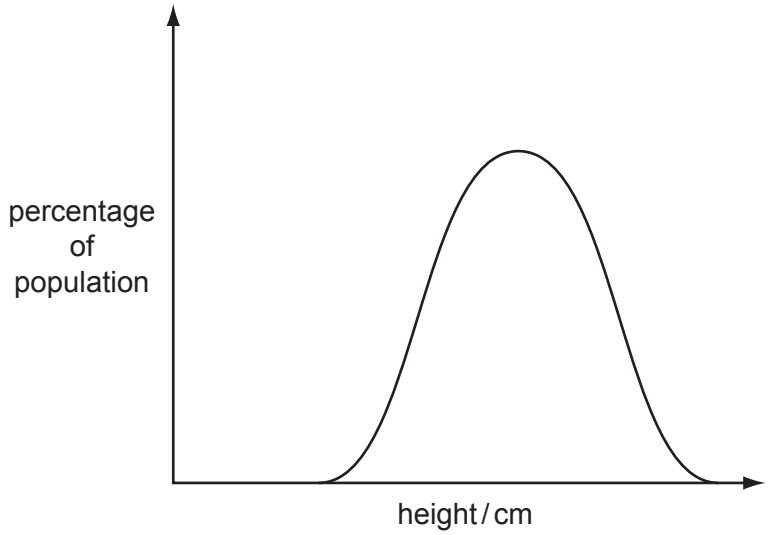

Fig. 3.1

State the type of variation shown by this data.

.....[1]

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(b) In Britain 42% of the population have blood group A. The frequency of the other blood groups is: B (9%), AB (3%) and O (46%).

(i) Plot the data, as a bar chart, on Fig. 3.2. [2]

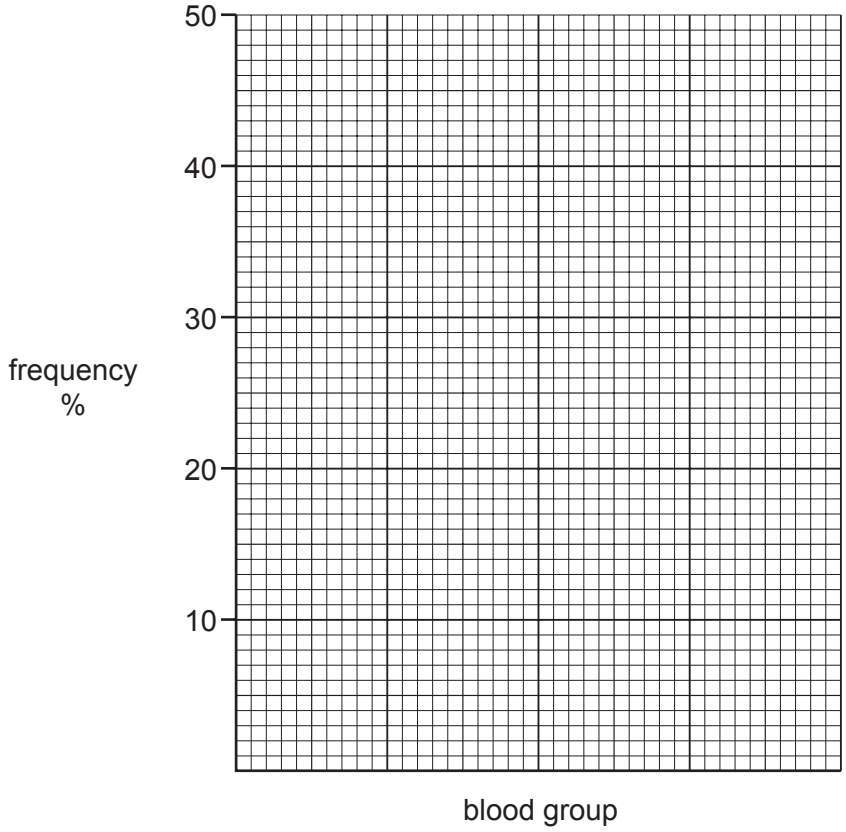

Fig. 3.2

(ii) Complete the following sentence.

Height is controlled by environment and by genes but human blood groups are controlled only by ..... [1]

(c) Sometimes human characteristics are altered by mutations.

(i) Define the term *mutation*.

.....

..... [1]

(ii) Suggest two factors that could increase the rate at which mutations occur.

1 .....

2 ..... [2]

[Total: 7]

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4 The table shows the area of tropical forests in some parts of the world and the rate of their destruction during the period 1990 – 2000.

region of the world	area of forest in 2000 / km^2	area destroyed each year 1990 – 2000 / km^2	annual percentage rate of destruction
A	697 000	13 000	1.8
B	1 389 000	18 000	1.3
C	2 154 000	15 000	0.7
D	117 000	2 000	1.7
E	434 000	12 000	2.8
F	8 399 000	84 000	1.0

(a) (i) State which region had the greatest area of forest destroyed each year.

..... [1]

(ii) State which region had the highest annual percentage rate of destruction.

..... [1]

(iii) Use the data to suggest what the area of tropical forest in Region F will be in 2100.

..... [1]

(iv) Predict which region will have the smallest area of forest in the year 2010.

..... [1]

(b) Tropical forests produce a large mass of dead vegetation each year which is decomposed.

(i) Name **one** type of microorganism that decomposes this dead plant matter.

..... [1]

(ii) Name two substances that are released during decomposition that benefit the plants in the forest.

1 .....

2 ..... [2]

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(c) Tropical forest is often cleared to provide ground for crop growth. However, after about three years, this land has to be abandoned and a new area is cleared. Suggest why a new area is needed after about three years of crop growing.

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.....

.....

.....

..... [3]

[Total: 10]

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5 Fig. 5.1 shows the carbon cycle. The arrows represent the various processes that happen in the cycle.

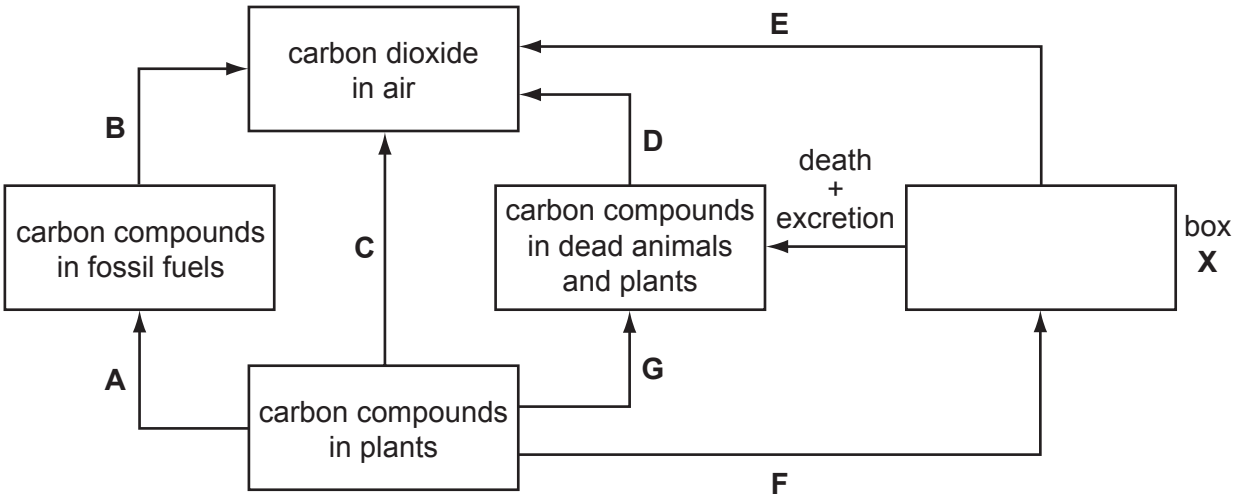

Fig. 5.1

(a) (i) Complete the diagram by filling in box **X**. [1]

(ii) State the letters of **two** arrows that represent respiration.

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

(iii) State the letter of the arrow that can only represent combustion in this cycle.

..... [1]

(iv) State the letter of the arrow that represents the process in the cycle that takes millions of years to happen.

..... [1]

(b) (i) Photosynthesis is not shown on the diagram. Draw an arrow on Fig. 5.1 to represent photosynthesis and label it **P**. [1]

(ii) Write a word equation for photosynthesis.

..... [2]

[Total: 8]

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6 Fig. 6.1 shows a plant cell from a leaf.

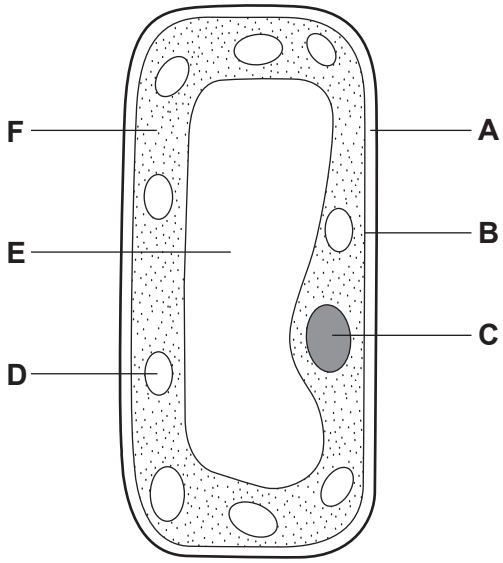

Fig. 6.1

(a) State the letters for the three parts of this cell that only occur in plant cells.

letters ..... , ... and ..... . [3]

(b) State **two** differences in structure between this leaf cell and a root hair cell.

Explain the reason for each difference.

difference .....

.....

reason .....

.....

difference .....

.....

reason .....

..... [4]

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(c) (i) Describe **one** difference that exists between a red blood cell and a typical animal cell.

.....

..... [1]

(ii) State an advantage of this feature in a red blood cell.

.....

..... [1]

[Total: 9]

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7 A student investigated the effect of changing pH on the rate of reaction of a digestive enzyme.

(a) Define the term *enzyme*.

.....

.....

..... [2]

Table 7.1 shows the results of this investigation.

Table 7.1

pH	1	2	3	4	5	6	7
rate of reaction / arbitrary units	10	15	9	6	3	1	0

(b) Plot the results as a line graph on Fig. 7.1. [3]

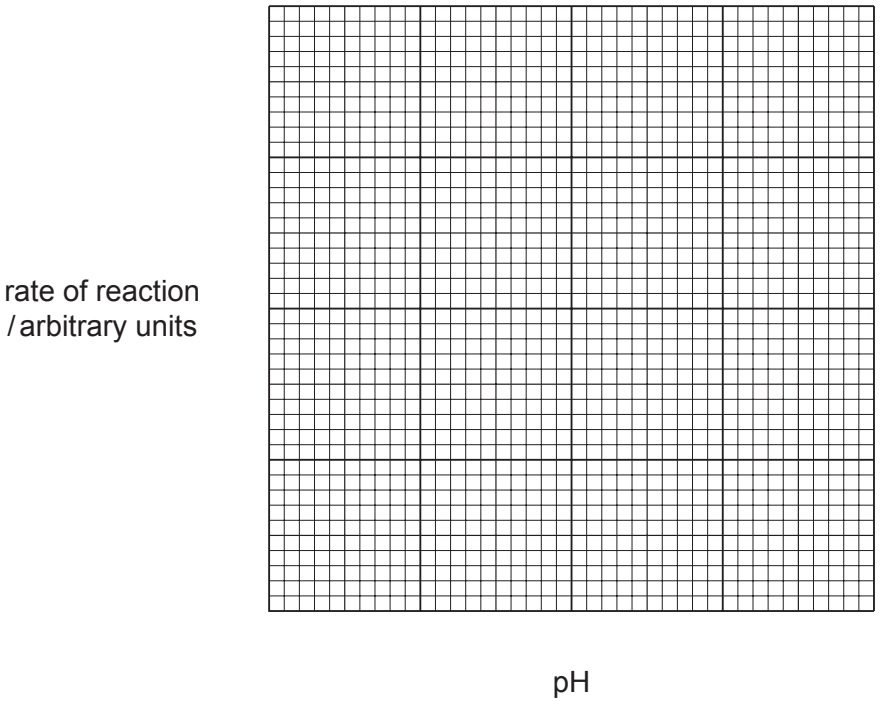

Fig. 7.1

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(c) Suggest where in the human digestive system this enzyme would have been most active.

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.....

[1]

(d) The investigation at pH 3 was repeated but the enzyme was boiled before its use. Suggest how and why the results would have been different.

.....

.....

.....

[2]

[Total: 8]

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8 **(a)** Describe and explain the importance of iron and vitamin D in the diet.

.....

.....

.....

.....

..... [3]

(b) If you do not have a balanced diet you may suffer from malnutrition.

State **two** effects of malnutrition, not including minerals and vitamins.

For each effect explain how it is caused.

.....

.....

.....

.....

.....

..... [4]

[Total: 7]

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9 Homeostasis is the maintenance of a constant internal environment, including a constant body temperature.

(a) Suggest why it is important that the body temperature of humans is kept constant.

.....

.....

..... [2]

(b) Describe and explain the effect of sweating in maintaining human body temperature.

.....

.....

.....

.....

.....

..... [4]

[Total: 6]

For Examiner's Use

10 (a) Water is lost from leaves by transpiration.

(i) Name the structures through which most water vapour is lost from a leaf.

..... [1]

(ii) Name the tissue that water flows through in the stem to reach a leaf.

..... [1]

(b) Fig. 10.1 is a graph showing the rate of water loss by a number of similar leafy shoots under different conditions.

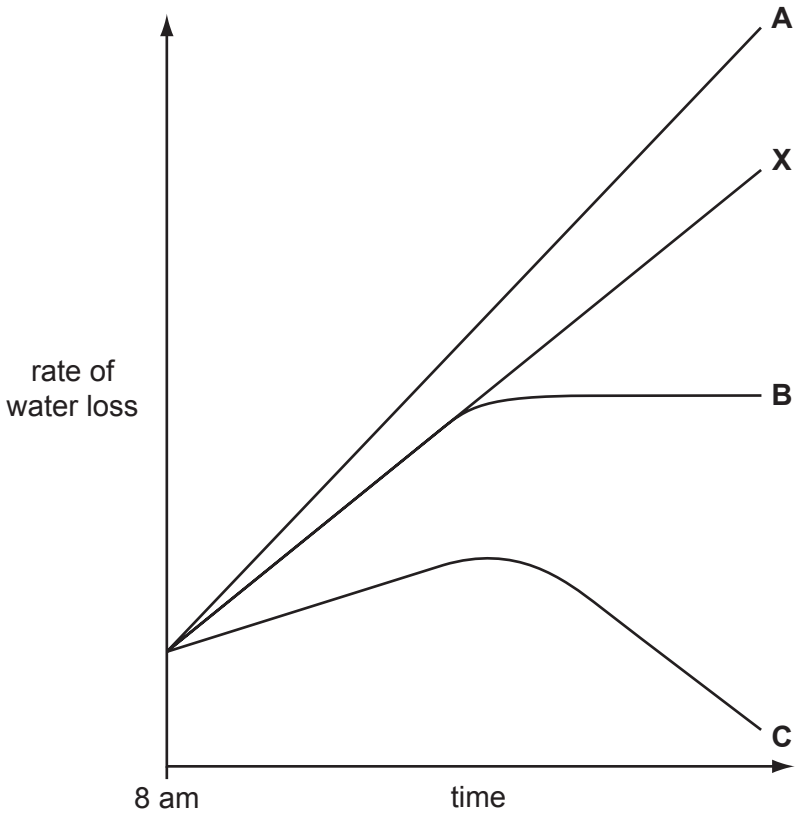

Fig. 10.1

Graph line **X** shows the rate of water loss by a shoot in slow moving air as the temperature increases from 8 am onwards.

(i) Suggest which line would show the rate of water loss of a shoot in fast moving air as the temperature increases from 8am onwards.

line .....

Explain your choice.

explanation .....

..... [2]

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(ii) Suggest which line would show the rate of water loss of a shoot that was placed in an airtight plastic bag at 8 am.

line .....

Explain your choice.

explanation .....

..... [2]

[Total: 6]

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