Transport mechanism

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Transport in plants
Sub Topic	Transport mechanism
Booklet	Theory
Paper Type	Question Paper 2

Time Allowed : **71 minutes**

Score : **/ 59**

Percentage : **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Fig. 4.1 shows the movement of sucrose from source to sink through the phloem in a plant.

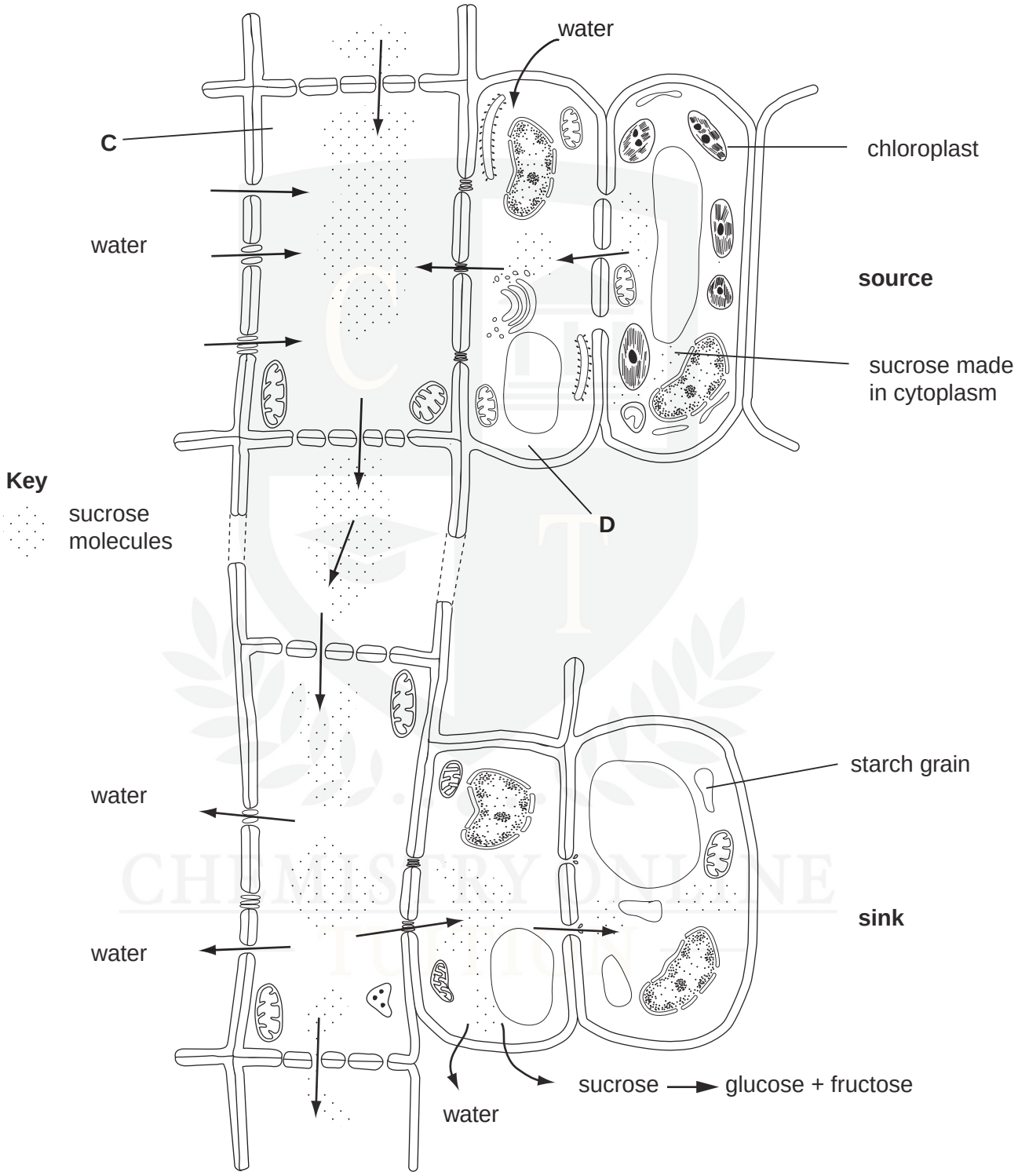

Fig. 4.1

(a) With reference to Fig. 4.1,

(i) name an example of a source and a sink

source .....

sink .....[1]

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

C .....

D .....[1]

(b) With reference to Fig. 4.1, explain how sucrose travels from,

the source to cell **C** .....

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cell **C** to the sink. .....

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.....[4]

(c) Explain why multicellular plants require transport systems for substances, such as water and sucrose.

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.....[2]

[Total: 8]

2 Fig. 4.1 shows transverse sections of a root and a stem.

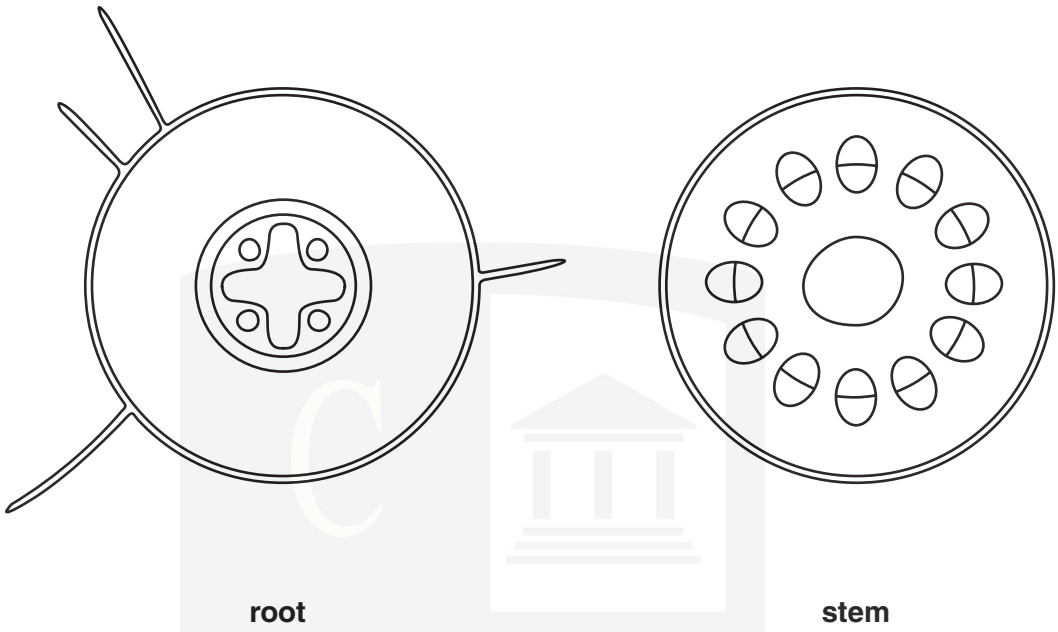

Fig. 4.1

(a) **(i)** Shade in an area in the transverse section of the root where there are cells specialised for the transport of water. [1]

(ii) Shade in an area in the transverse section of the stem where there are cells specialised for the transport of sucrose. [1]

(b) Suggest why the vascular bundles in the stem are situated towards the outside.

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.....[1]

(c) Describe the process by which water passes from the soil into the root hairs.

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.....[2]

(d) Explain how water passes from the stem to the air surrounding a leaf.

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.....[4]

[Total : 9]

3 Fig. 6.1 shows the pathway taken by water as it enters the root of a flowering plant.

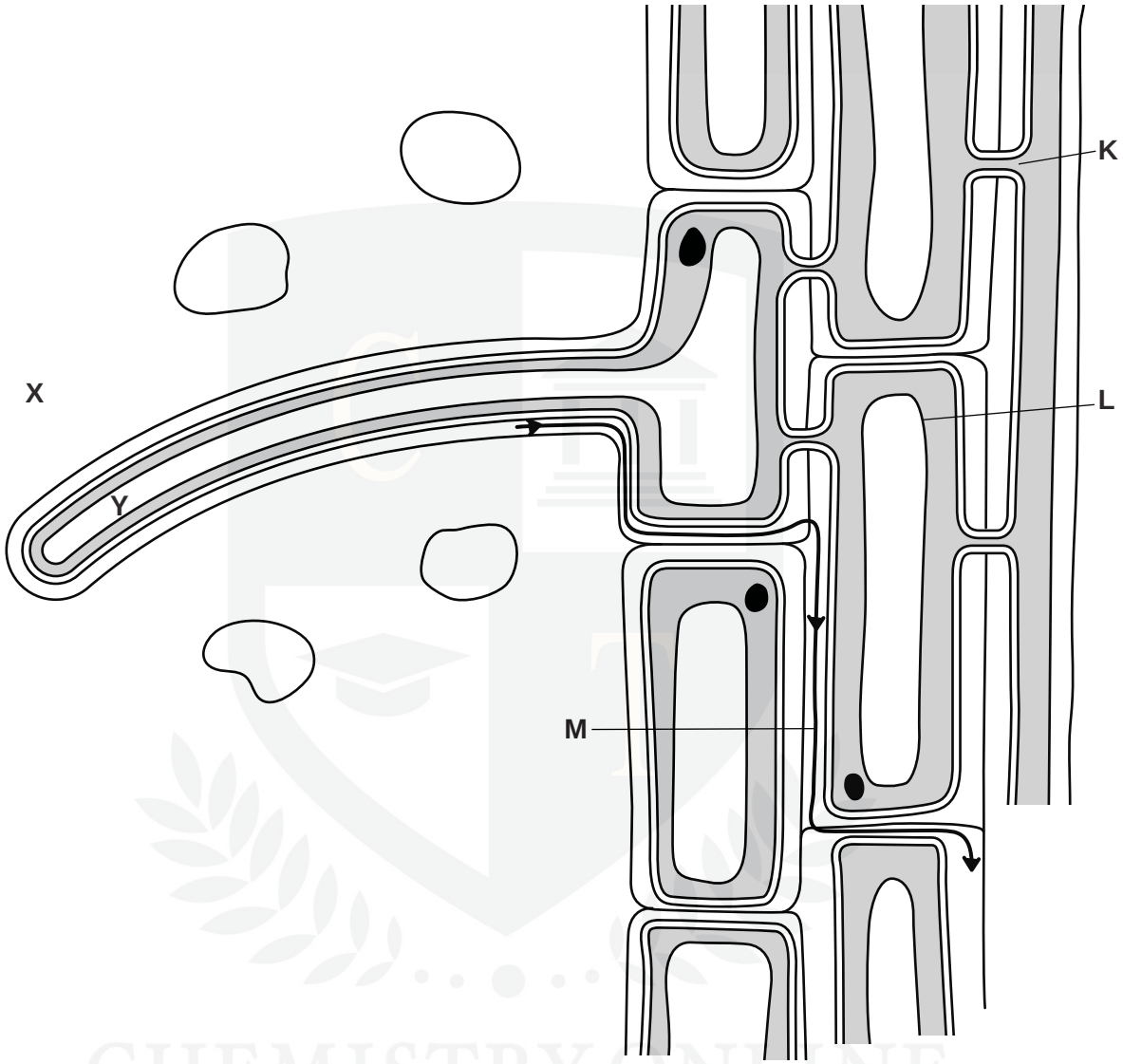

Fig. 6.1

(a) Explain how water passes from **X** to **Y**.

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..... [3]

(b) Name:

(i) the structures **K** and **L**

K .....

L .....
[2]

(ii) the pathway indicated by **M**.

.....[1]

[Total: 6]

4 Fig. 2.1 shows one section of the nitrogen (N) cycle. Some details of the water cycle are also included.

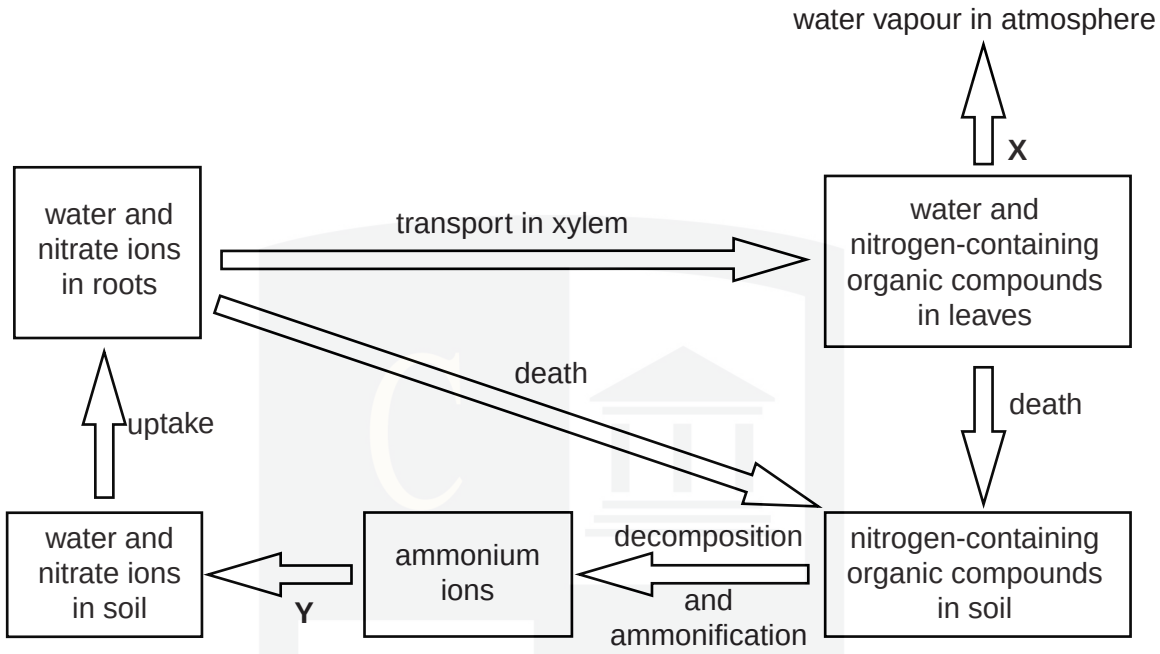

Fig. 2.1

(a) Name processes **X** and **Y**.

X .....

Y .....[2]

(b) Name **one** organism involved in process **Y**.

.....[1]

(c) Explain why process **X** occurs, even if it is a disadvantage to a plant.

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.....[1]

(d) State two examples of how the leaves of xerophytic plants are adapted to reduce the loss of water vapour to the atmosphere.

1. .....

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2. .....

.....[2]

(e) Nitrate ions are taken up by root hair cells.

Outline the role of the cell surface membrane of root hair cells in the uptake of nitrate ions.

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(f) Describe **and** explain how water and nitrate ions are transported in the xylem from roots to leaves.

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(g) One use of the nitrogen in the nitrate ions is for the synthesis of organic molecules such as RNA.

State where nitrogen is found within an RNA molecule.

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[Total: 13]

5 **(a)** Explain the need for transport systems in plants.

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(b) Fig. 3.1 is a drawing of a transverse section through part of the stem of a dicotyledonous plant. Cell **A** and cell **B** are involved in the transport of dissolved organic molecules.

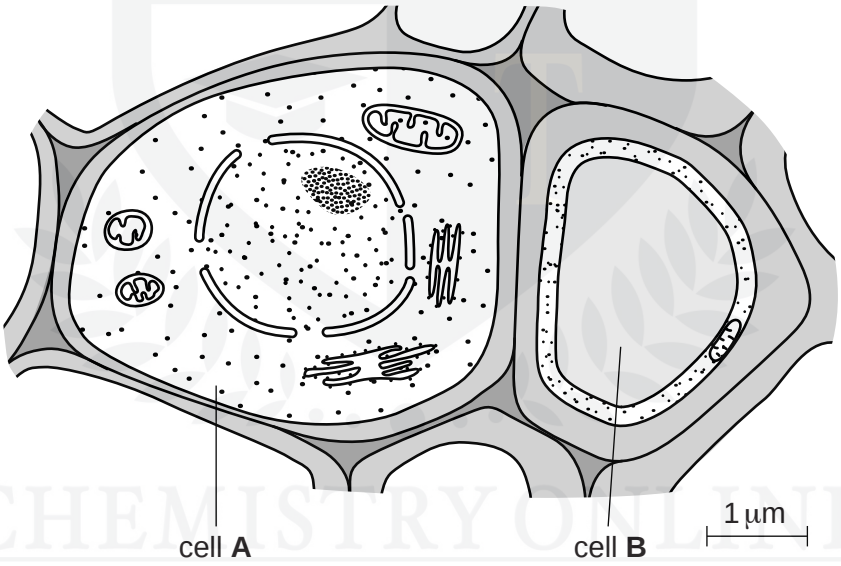

Fig. 3.1

(i) Name cell **A** and cell **B**.

*cell **A*** .....

*cell **B*** .....[1]

(ii) With reference to Fig. 3.1, explain how the different structures of cell types **A** and **B** are related to their function.

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(c) Complete Table 3.1 to state four differences between transport systems in mammals and in plants.

Table 3.1

transport system in mammals	transport system in plants

[4]

[Total: 13]

6 **(a)** Explain what is meant by the term transpiration.

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.....[2]

The rates of transpiration of plants of two species, **A** and **B**, were measured over a period of seven hours. The results are shown in Fig. 4.1.

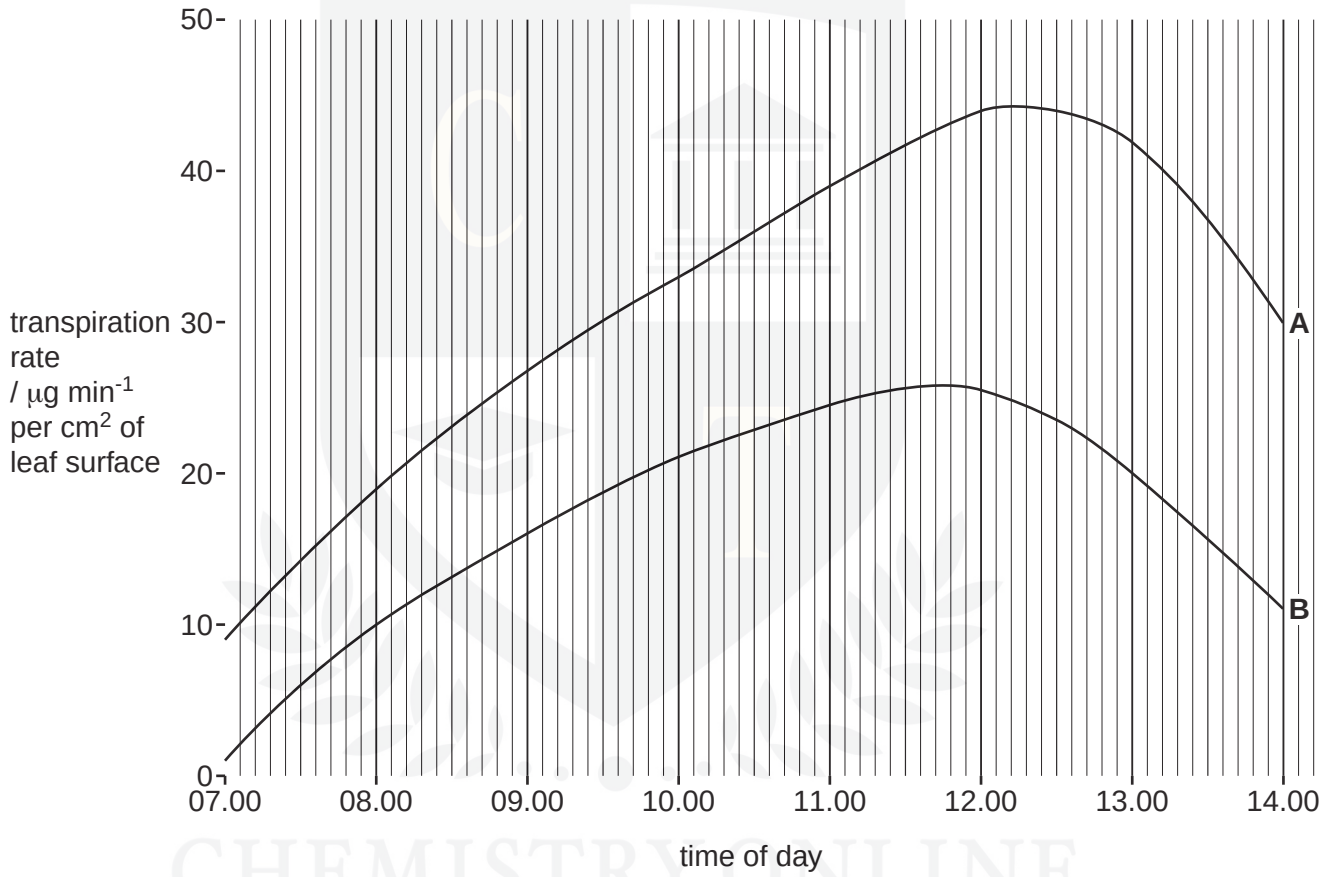

Fig. 4.1

(b) With reference to Fig. 4.1, compare the rates of transpiration of the two species over the seven hour period.

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.....[4]

(c) State two possible features of the **leaves** of species **B** that could explain the different rates of transpiration in comparison with species **A**.

Explain how each feature acts to reduce transpiration.

feature .....

explanation .....

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feature .....

explanation .....

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.....[4]

[Total: 10]