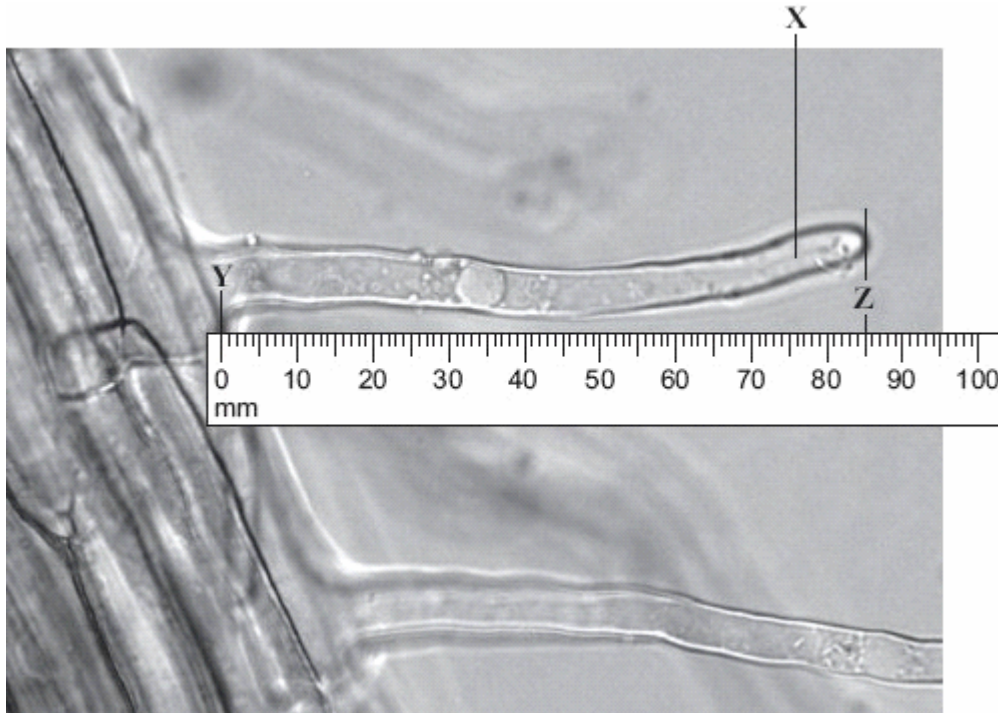


Exchange systems in plants

1. The photograph shows part of the surface of a plant root. This part of the root is covered with hundreds of structures like the one labelled X.



- (a) What is the name of structure X?

Draw a ring around **one** answer.

root hair **stoma** **villus**

(1)

- (b) (i) Use the scale to measure the length Y–Z on the photograph.

On the photograph, length Y–Z = mm.

(1)

- (ii) The photograph shows the root magnified 100 times.

Calculate the actual length Y–Z.

.....

Actual length Y–Z =mm.

(2)

- (iii) Structure X is very small. There are thousands of structures like X on a plant root.
How does this help the plant?

.....

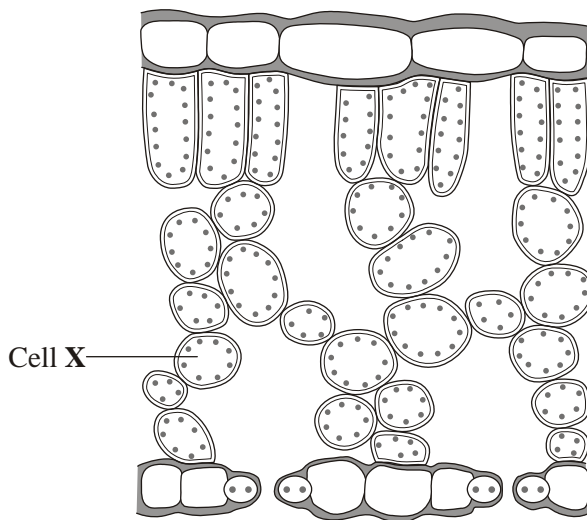
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(2)
(Total 6 marks)

2. (a) The diagram shows a section through a plant leaf.
Water evaporates from cell X.



- (i) **On the diagram**, draw an arrow to show how water vapour from cell X gets out of the leaf.

(1)

- (ii) Name the process by which water vapour is lost from a leaf.
Draw a circle around **one** answer.

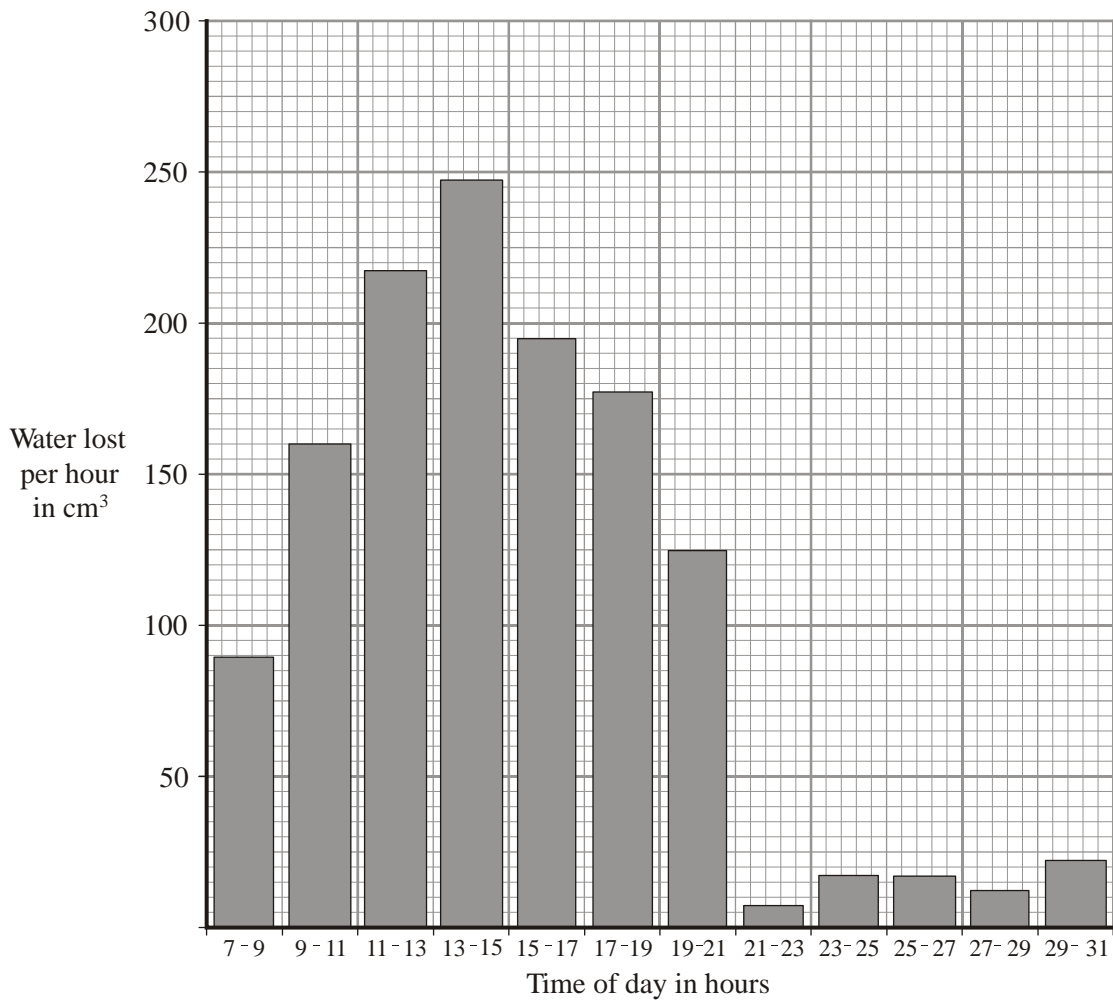
osmosis

transpiration

wilting

(1)

- (b) The graph shows how much water was lost from a plant at different times of the day.



(i) During which 2-hour period was water lost most quickly?

.....

(1)

(ii) Give **one** possible explanation why water was lost most quickly at this time.

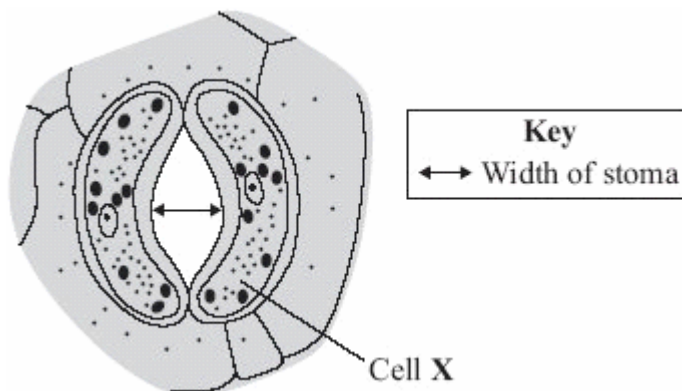
.....

(2)

(Total 5 marks)

3. Plant leaves have many stomata.

The diagram shows a stoma.



(a) Name cell X

(1)

(b) The table shows the mean widths of the stomata at different times of the day for two different species of plant.
 Species **A** normally grows in hot, dry deserts.
 Species **B** grows in the UK.

	Time of day in hours	Mean width of stomata as a percentage of their maximum width	
		Species A	Species B
Dark	0	95	5
	2	86	5
	4	52	6
Light	6	6	40
	8	4	92
	10	2	98
	12	1	100
	14	0	100
	16	1	96
	18	5	54
Dark	20	86	6
	22	93	5
	24	95	5

The data in the table show that species **A** is better adapted than species **B** to living in hot, dry deserts.

Explain how.

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.....

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(4)
(Total 5 marks)