Transport in Flowering Plants

Question Paper

Level	O Level
Subject	Biology
Exam Board	Cambridge International Examinations
Topic	Transport in Flowering Plants
Sub Topic	
Booklet	Question Paper

Time Allowed: **46 minutes**

Score: **/38**

Percentage: **/100**

1 Which statement best describes the movement of water through the stem of a plant?

A Water moves up the stem as it evaporates from the leaves.

B Water moves up the stem as it is pushed by water entering the roots.

C Water moves up the stem because it is used in photosynthesis.

D Water moves up the stem by osmosis.

2 What is the main cause of water moving up to the leaves in xylem vessels?

A active transport

B evaporation from the epidermis of the leaf

C evaporation from the walls of the mesophyll cells

D use of water in photosynthesis

3 Under which set of conditions will the transpiration rate of a well-watered plant be fastest?

A a cool, dry, windless day

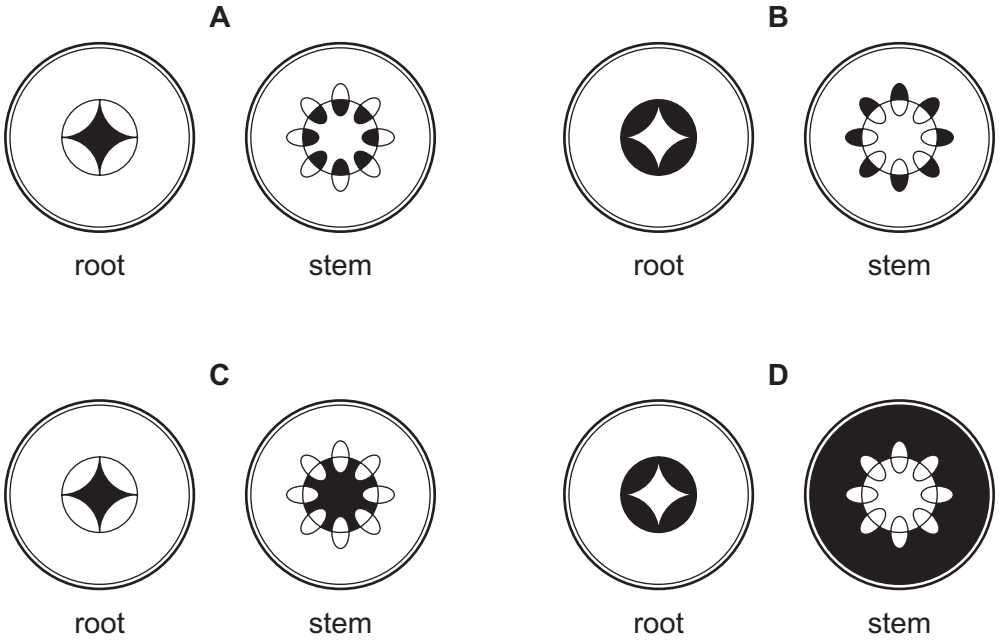
B a cool, rainy, windy day

C a hot, dry, windy day

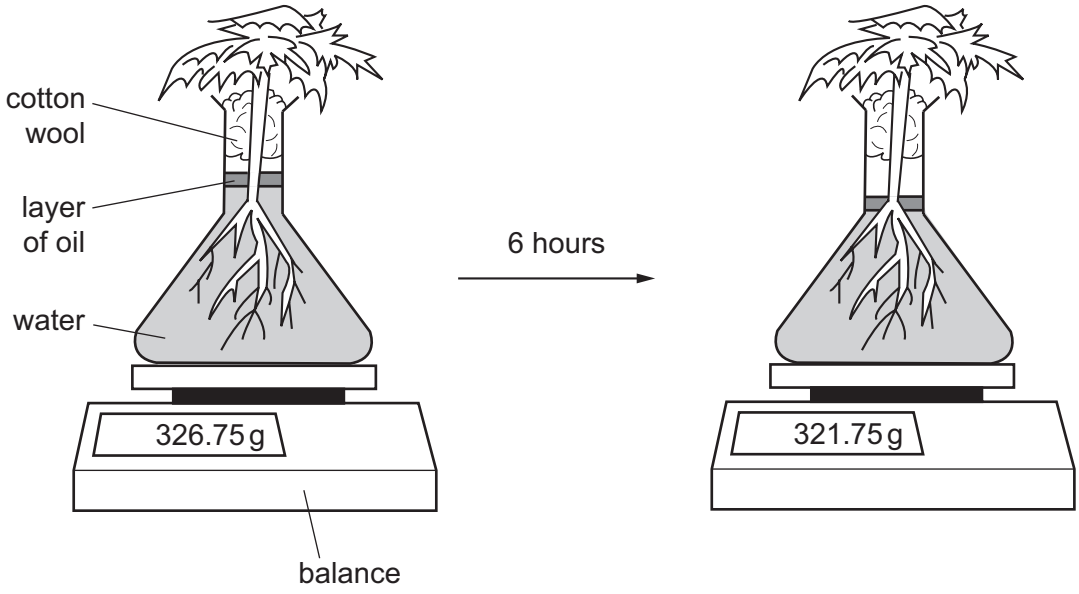
D a hot, rainy, windy day

4 A plant was placed in water containing black dye. After 24 hours the plant was removed and sections were taken from the root and the stem.

Which diagram shows the results?



5 The diagrams show a plant in a flask of water. It is left in the light at 16 °C for six hours.



What explains the change in mass after six hours?

A absorption of water into the root hairs

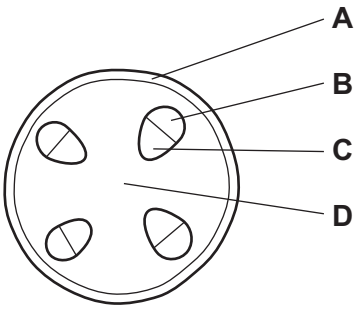
B evaporation of water from the flask

C photosynthesis in the leaves of the plant

D transpiration from the leaves of the plant

6 The diagram shows a section through the stem of a dicotyledonous plant.

Which tissue transports sugars through the stem?



7 Which effects will an increase in temperature and an increase in humidity have on the transpiration rate of a plant?

	transpiration rate	
	with increased temperature	with increased humidity
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

8 What is the main source of the energy that causes water to rise up a plant stem?

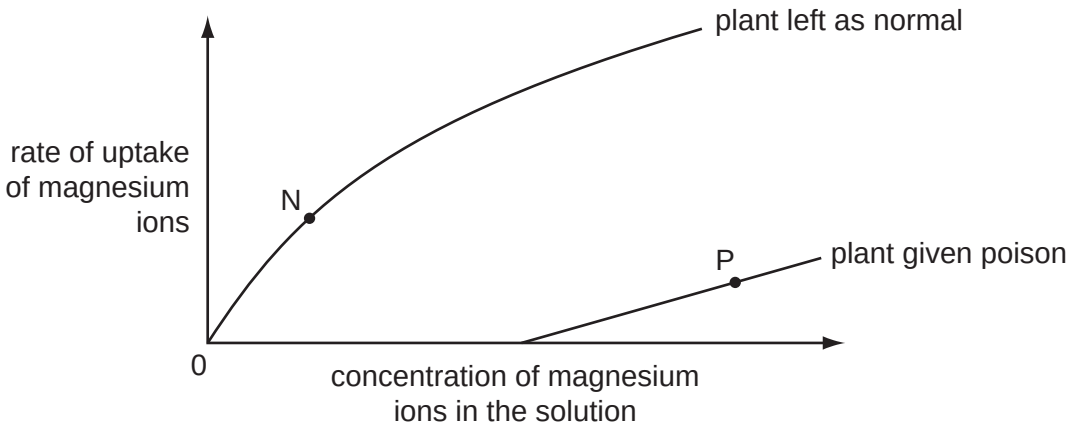
A difference in water potential between cell sap and soil water

B heat from the Sun

C light absorbed by chlorophyll

D respiration of sugars made in photosynthesis

9 An experiment measured the rate at which plants take up magnesium ions from solution. One plant was given a poison that stops respiration. Another plant was left as normal. The graph shows the results.



How are the magnesium ions being absorbed by the plants at points N and P?

	point N	point P
A	active transport	active transport
B	active transport	diffusion
C	diffusion	active transport
D	diffusion	diffusion

10 What contributes to the wilting of plant leaves?

A the mesophyll cells lose turgor

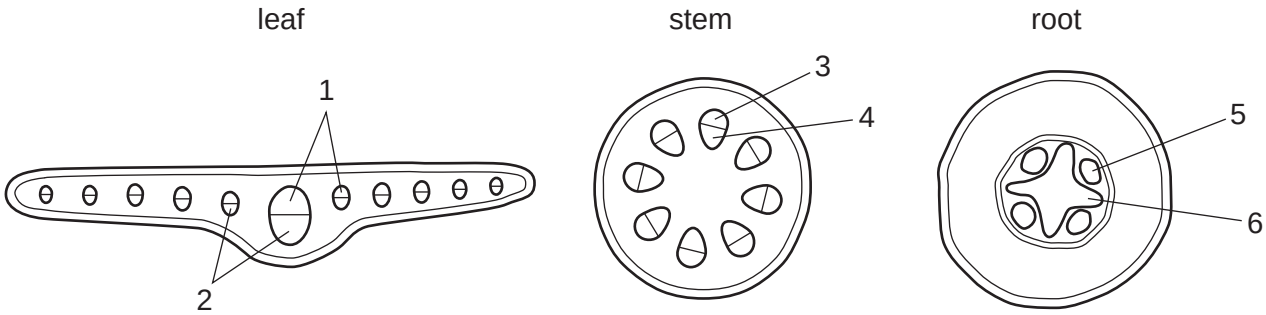
B the phloem stops translocating

C the stomata close

D the xylem fills with air

11 In an experiment to investigate the transport of water, the roots of a plant are placed in water coloured with a dye.

The diagrams show sections of the leaf, stem and root.



Which numbered parts will become stained by the dye as the water is initially absorbed?

	leaf	stem	root
A	1	3	5
B	2	3	6
C	1	4	6
D	2	4	5

12 In which direction do water molecules move in the phloem and in the xylem of a plant stem?

	phloem	xylem
A	down only	up only
B	up only	down only
C	up only	both up and down
D	both up and down	up only

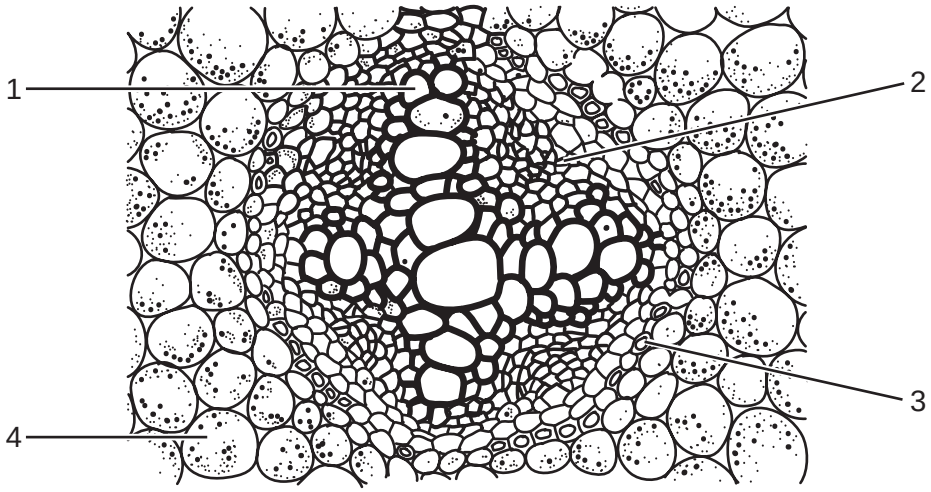
13 Four similar leafy shoots are exposed to different conditions. The rates of water uptake and the rates of water loss are measured.

The results are shown in the table.

Which shoot is most likely to wilt?

	water uptake / mm^3 per min	water loss / mm^3 per min
A	14	13
B	10	12
C	5	5
D	4	2

14 The diagram shows a transverse section of the central portion of a root in a dicotyledonous plant.



Which tissues transport amino acids and sugars?

	amino acids	sugars
A	1	3
B	2	2
C	3	4
D	4	1

15 Transpiration increases when conditions become

A less humid and less windy.

B less humid and more windy.

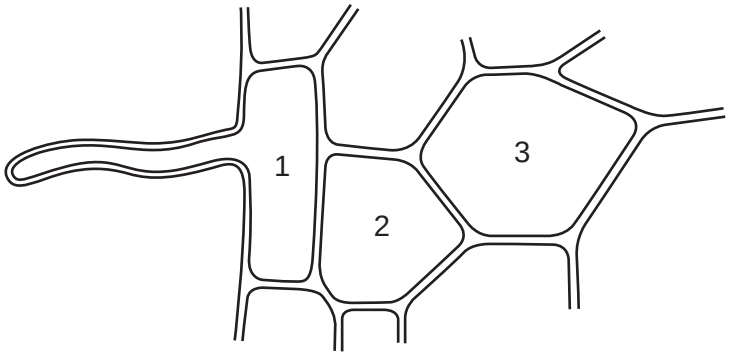
C more humid and less windy.

D more humid and more windy.

16 Through which organs do carbon dioxide molecules, magnesium ions and nitrate ions enter plants?

	carbon dioxide molecules	magnesium ions	nitrate ions
A	leaves	roots	leaves
B	leaves	roots	roots
C	roots	leaves	leaves
D	roots	leaves	roots

17 The diagram shows some cells in the root of a plant that is absorbing water from the soil.



How does the water potential of the cell marked 2 differ from the water potentials of the cells marked 1 and 3?

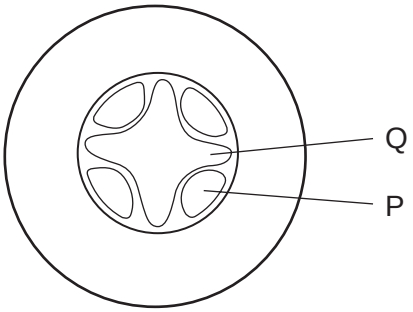
A higher than cell 1 and cell 3

B higher than cell 1 and lower than cell 3

C lower than cell 1 and higher than cell 3

D lower than cell 1 and lower than cell 3

18 A herbaceous plant, growing in a nutrient solution, is placed in a well-lit experimental chamber through which humid air is being passed slowly. The diagram below shows a section through a part of the plant.

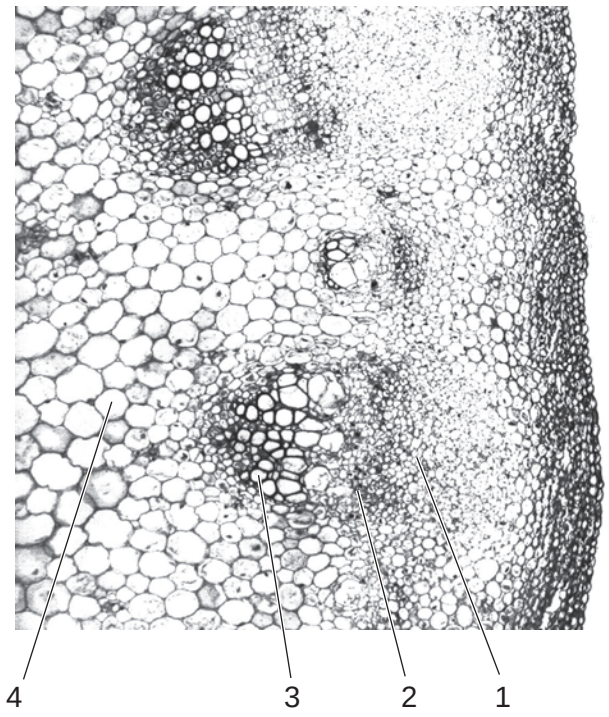


The speeds of movement of the fluids in tissues P and Q are measured. The humid air is then replaced by dry air and the speeds of movement of the fluids change.

What are these changes?

	tissue P	tissue Q
A	greatly increased upward movement	greatly increased downward movement
B	greatly increased downward movement	little change
C	little change	greatly increased downward movement
D	little change	greatly increased upward movement

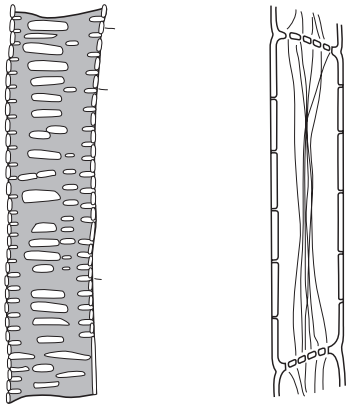
19 The photomicrograph shows part of a sunflower stem.



Which tissue transports water and mineral salts and which tissue transports sucrose?

	water and mineral salts	sucrose
A	1	4
B	2	3
C	3	2
D	4	1

20 The diagram shows two plant cells, X and Y, drawn to different scales.



X Y

Samples of the contents of X and Y were tested for nutrients.

What results are expected?

	X		Y	
	Benedict's reagent	iodine in potassium iodide solution	Benedict's reagent	iodine in potassium iodide solution
A	+	+	–	+
B	+	–	+	–
C	–	+	–	+
D	–	–	+	–

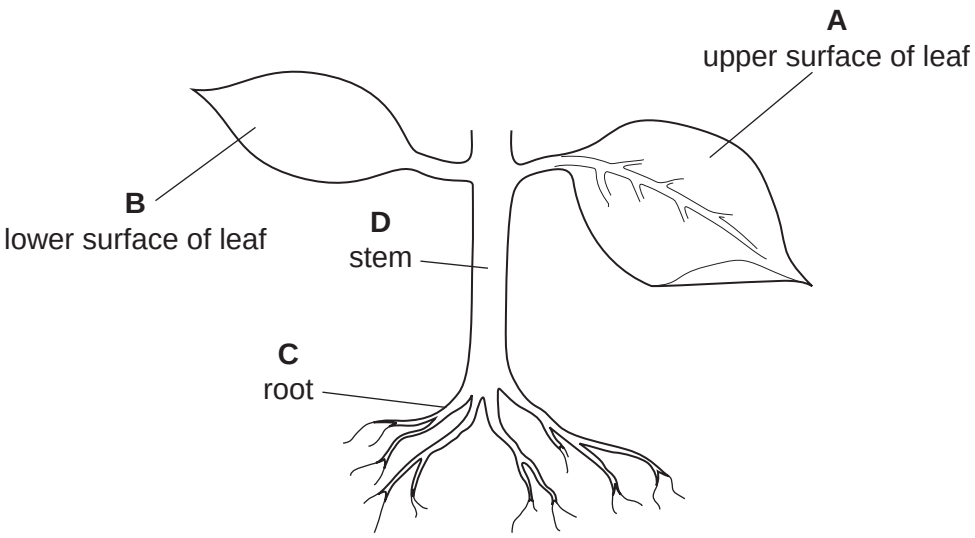
key
– = negative result
+ = positive result

21 Which substances are transported in xylem and in phloem?

	xylem	phloem
A	amino acids and mineral ions	amino acids and water
B	mineral ions and sucrose	starch and mineral ions
C	mineral ions and water	sucrose and water
D	starch and water	sucrose and starch

22 The diagram shows part of a flowering plant.

Where does most transpiration take place?



23 During translocation in plants, which substance is moved and in which direction?

	substance	from	to
A	sucrose	anthers	stigmas
B	sucrose	leaves	roots
C	water	roots	leaves
D	water	soil	root hairs

24 Which substances are transported in the phloem and which in the xylem?

	phloem	xylem
A	nitrate ions	sugar
B	starch	nitrate ions
C	sugar	water
D	water	starch

25 When a complete ring of bark is removed from the trunk of a tree, it will eventually die because this action cuts off the supply of

A mineral salts to the leaves.

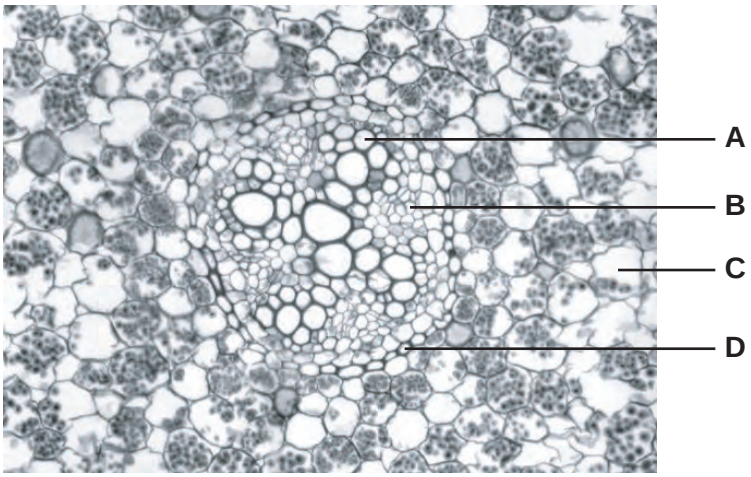
B nutrients to the roots.

C oxygen to the roots.

D water to the leaves.

26 The diagram shows a transverse section from the middle of a root of a dicotyledonous plant.

In which tissue are sugars and amino acids transported?



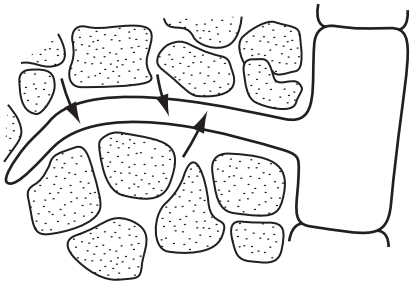
27 Crop plants are grown in well-watered soils.

Their root hair cells have higher concentrations of mineral ions than in the soil surrounding them.

What processes are used by these plants to absorb water and mineral ions?

	water	mineral ions
A	active uptake	osmosis
B	diffusion	osmosis
C	osmosis	diffusion
D	osmosis	active uptake

28 The diagram shows a root hair absorbing ions from the surrounding soil.



What will assist the uptake of ions by the root hair?

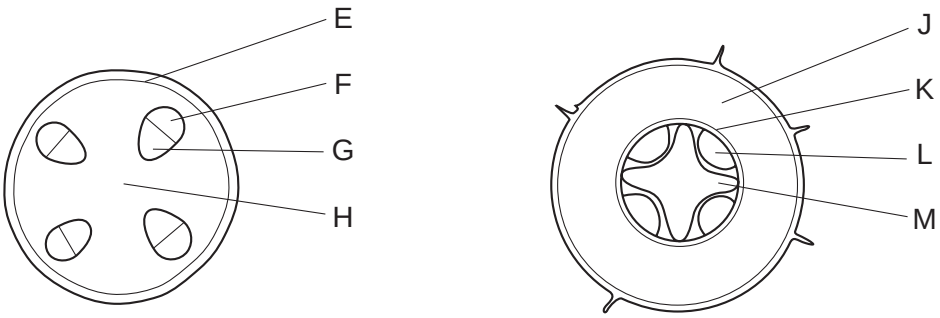
A a higher concentration of ions in the root hair than in the soil

B a low temperature in the surrounding soil

C rapid uptake of water from the soil by osmosis

D the large surface area of the root hair

29 The diagram shows sections through the stem and root of a dicotyledonous plant.

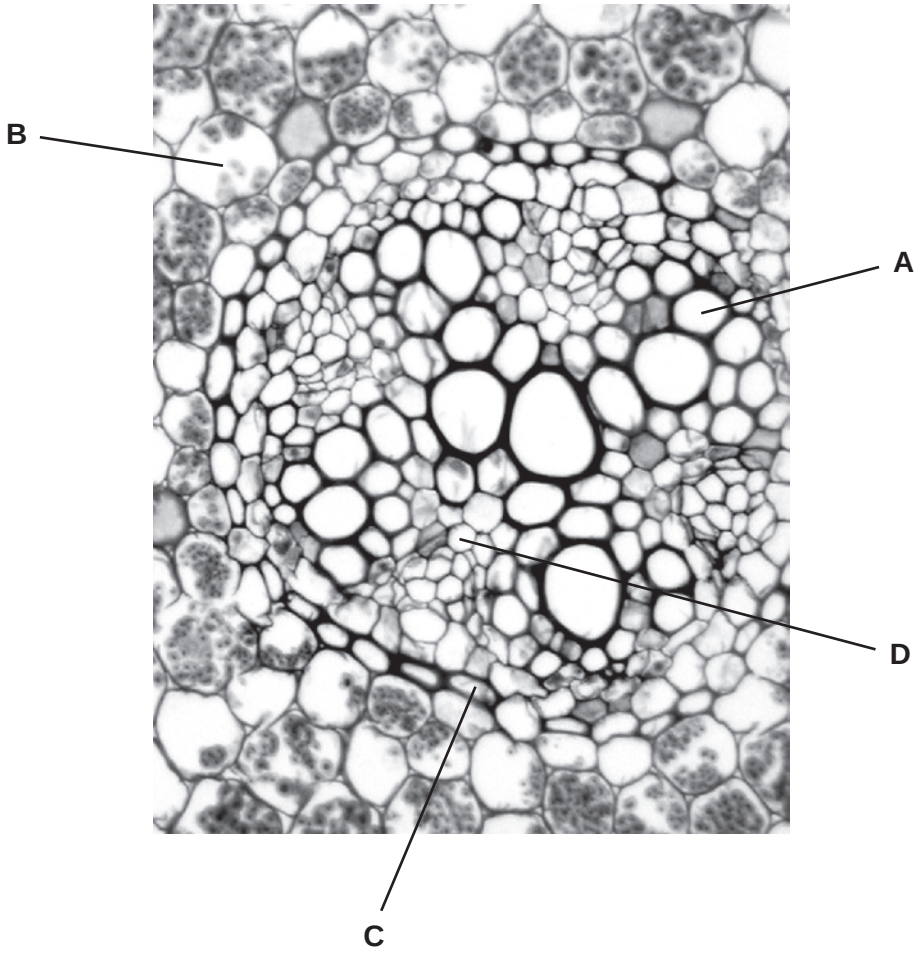


Which structures transport sugars through the stem and root?

A E and J **B** F and L **C** G and M **D** H and K

30 The photomicrograph shows a section of part of the root of a plant.

Through which tissue are sugars and amino acids transported?



31 Which of the following environmental conditions would cause rapid transpiration?

	air	light	temperature
A	damp	bright	cold
B	damp	dim	warm
C	dry	bright	warm
D	dry	dim	cold

32 Which conditions cause the fastest rate of transpiration?

A dry and cold

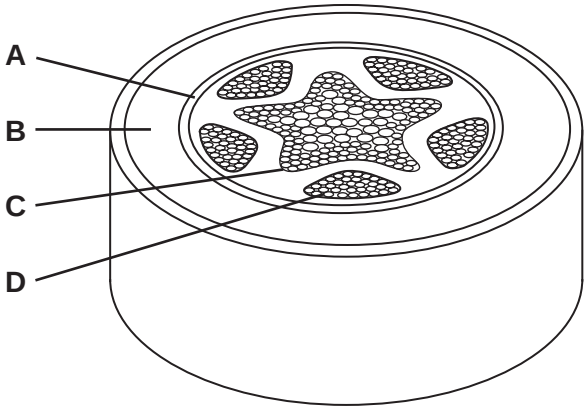
B dry and warm

C wet and cold

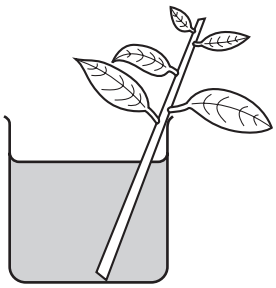
D wet and warm

33 The diagram shows a cross-section of a root.

Which tissue transports water to the leaves?



34 When a leafy shoot is placed in a solution of dye, which part becomes most heavily stained?



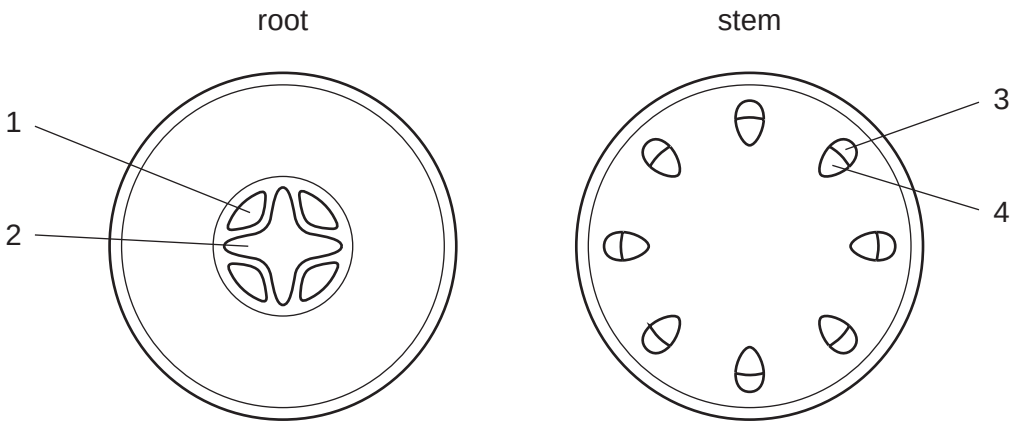
A guard cells in the leaves

B palisade cells in the leaves

C phloem cells in the stem

D xylem vessels in the stem

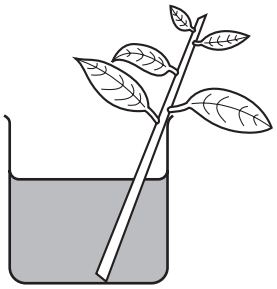
35 The diagrams show transverse sections from the root and the stem of a plant.



Which tissues carry amino acids in solution?

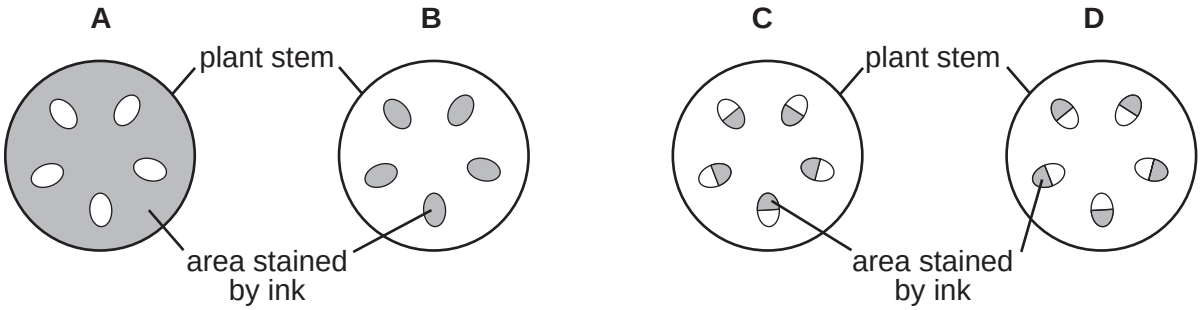
	root	stem
A	1	3
B	1	4
C	2	3
D	2	4

36 A plant shoot is left in ink solution for several hours.



A section is cut through the stem.

What would you see?

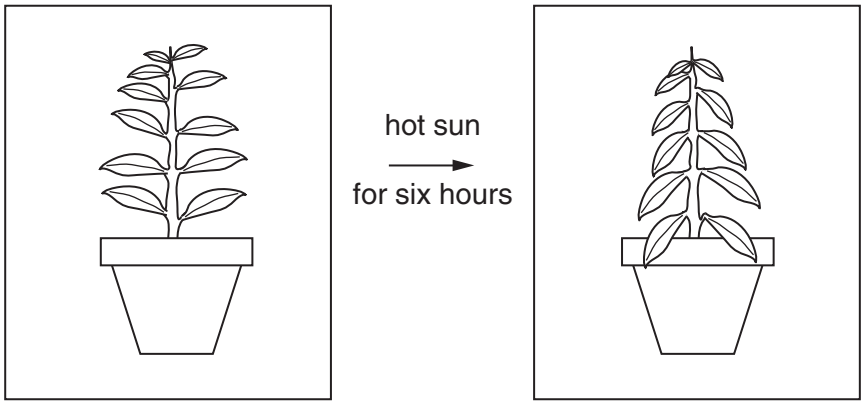


37 A plant is exposed to different temperatures and humidities.

Which set of conditions cause the plant to lose most water?

	temperature / °C	humidity / %
A	15	30
B	15	60
C	25	30
D	25	60

38 A plant is left in the hot sun for six hours.



The diagram shows how the appearance of the plant changes during this time.

Which statement explains the change in appearance of the plant?

A More water is lost by transpiration than is absorbed.

B Stomata have closed.

C The water potential of the cells has increased.

D There is less support provided by the xylem.