Transport in plants – 2021 IGCSE 0610

1. March/2021/Paper_12/No.17

Which statement about a function of xylem tissue is correct?

A It carries glucose from the roots to the leaves.

B It helps to support stems and leaves.

C It is the only transport tissue in the plant.

D It carries water away from the leaves.

2. March/2021/Paper_12/No.18

What is part of the definition of transpiration?

A the loss of water vapour from plant leaves by evaporation of water at the surfaces of the mesophyll cells

B the movement of molecules into the cells of the organism where they are used

C the movement of particles through a cell membrane from a region of lower concentration to a region of higher concentration

D the transport of mineral ions from the roots into the stem and leaves

3. June/2021/Paper_11/No.18

A plant shoot is placed in a solution of dye.

The dye moves up the stem.

Under which conditions will the dye move most slowly?

	temperature	humidity
A	high	high
B	high	low
C	low	high
D	low	low

4. June/2021/Paper_12/No.17

Which sequence describes the pathway taken by water as it moves through a plant?

A root hair cell → xylem → root cortex cell → mesophyll

B mesophyll → xylem → root cortex cell → root hair cell

C root cortex cell → root hair cell → xylem → mesophyll

D root hair cell → root cortex cell → xylem → mesophyll

5. June/2021/Paper_12/No.18

A plant shoot is placed in a solution of dye.

The dye moves up the stem.

Under which conditions will the dye move most slowly?

	temperature	humidity
A	high	high
B	high	low
C	low	high
D	low	low

6. June/2021/Paper_13/No.18

A plant shoot is placed in a solution of dye.

The dye moves up the stem.

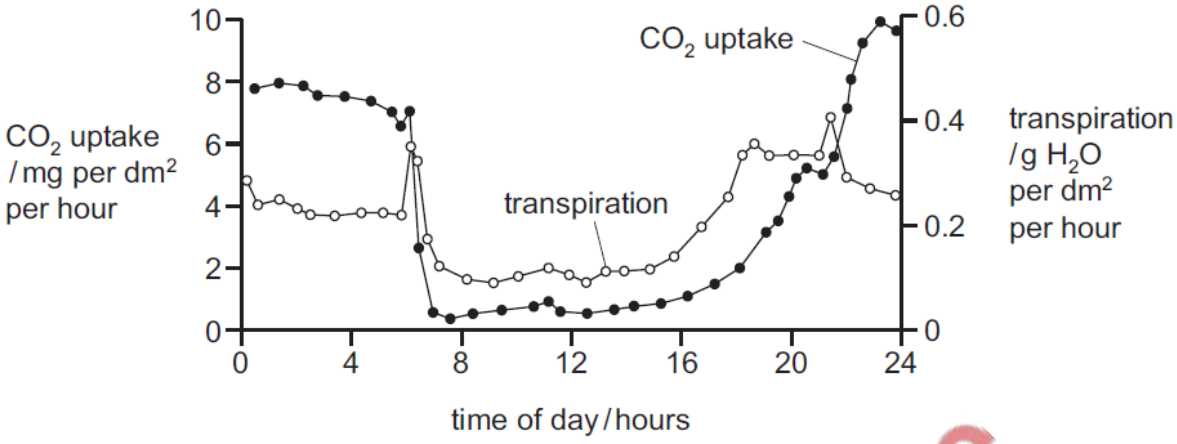
Under which conditions will the dye move most slowly?

	temperature	humidity
A	high	high
B	high	low
C	low	high
D	low	low

7. June/2021/Paper_21/No.14

The graph shows daily carbon dioxide uptake and transpiration by the plant *Agave americana*.

The plant is adapted to live in very dry conditions.



What can be concluded from this graph?

A More stomata are closed during dark periods.

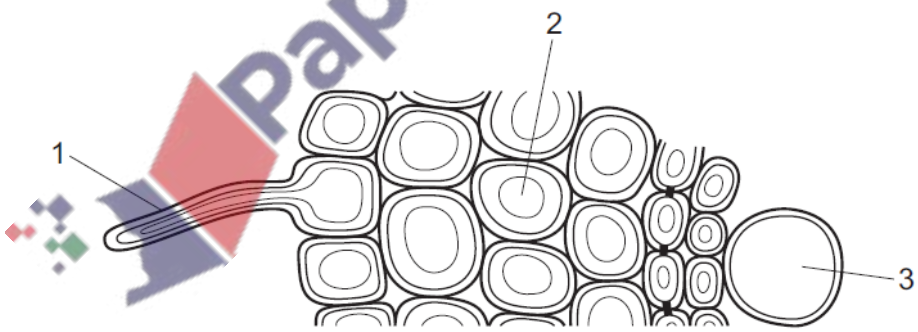
B More stomata are closed during light periods.

C There is no carbon dioxide uptake during dark periods.

D There is no water uptake during light periods.

8. June/2021/Paper_21/No.17

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



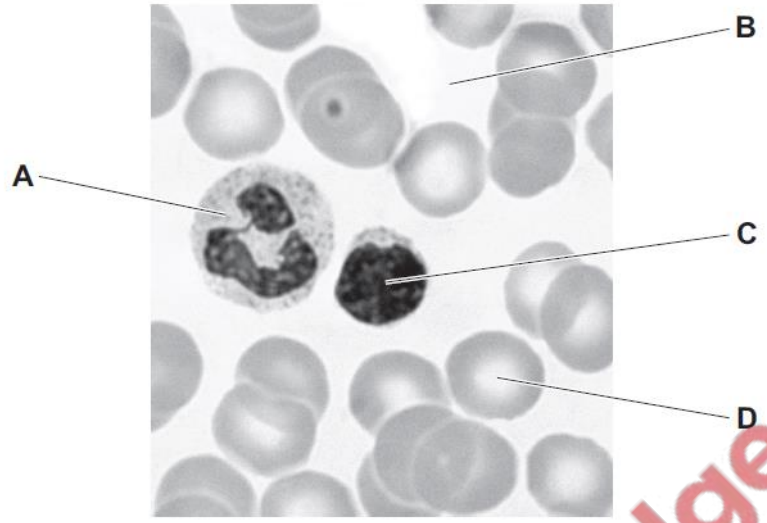
What are cells 1, 2 and 3?

	1	2	3
A	root cortex cell	root hair cell	mesophyll cell
B	root hair cell	root cortex cell	xylem
C	root hair cell	root cortex cell	mesophyll cell
D	root cortex cell	root hair cell	xylem

9. June/2021/Paper_21/No.20

The photomicrograph shows human blood.

Which blood component makes antibodies?



10. June/2021/Paper_22/No.17

Which sequence describes the pathway taken by water as it moves through a plant?

A root hair cell → xylem → root cortex cell → mesophyll

B mesophyll → xylem → root cortex cell → root hair cell

C root cortex cell → root hair cell → xylem → mesophyll

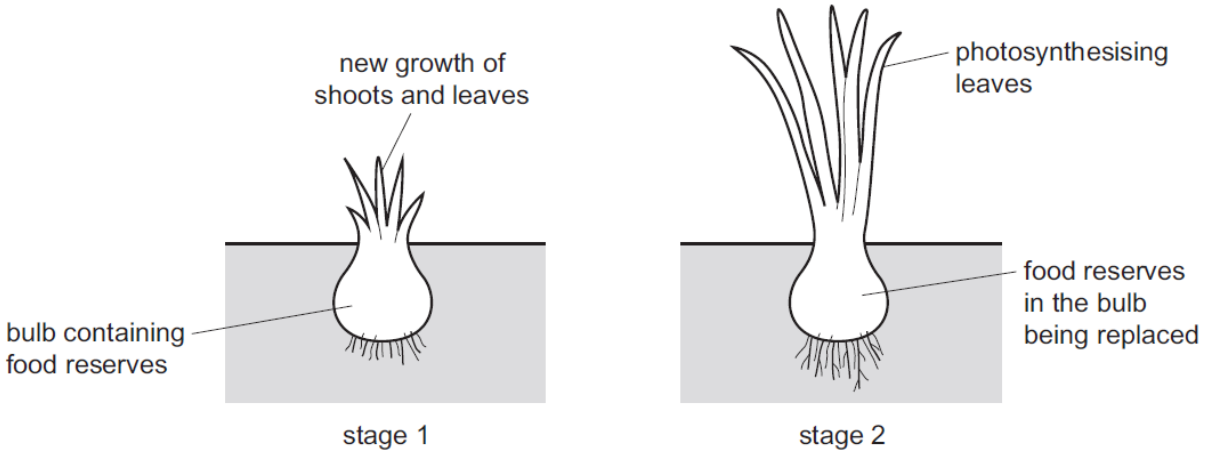
D root hair cell → root cortex cell → xylem → mesophyll

11. June/2021/Paper_22/No.18

The diagram shows a plant at different times of year.

stage 1 At the start of the growing season, the plant uses the food reserves stored in the bulb for the growth of shoots and leaves.

stage 2 Later in the season, the leaves of the plant photosynthesise and the food reserves in the bulb are replaced.

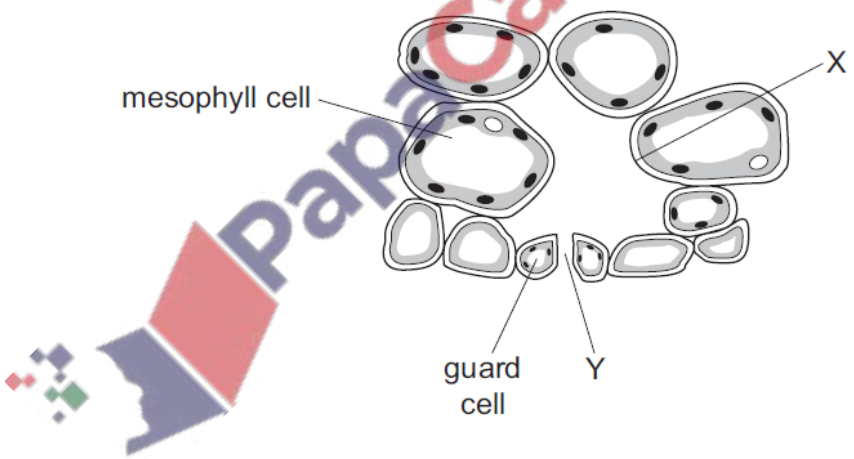


What is the role of the bulb during stage 1 and stage 2?

	stage 1	stage 2
A	sink	sink
B	sink	source
C	source	sink
D	source	source

12. June/2021/Paper_23/No.17

The diagram shows one of the stomata of a leaf, and some of the cells that are near it.

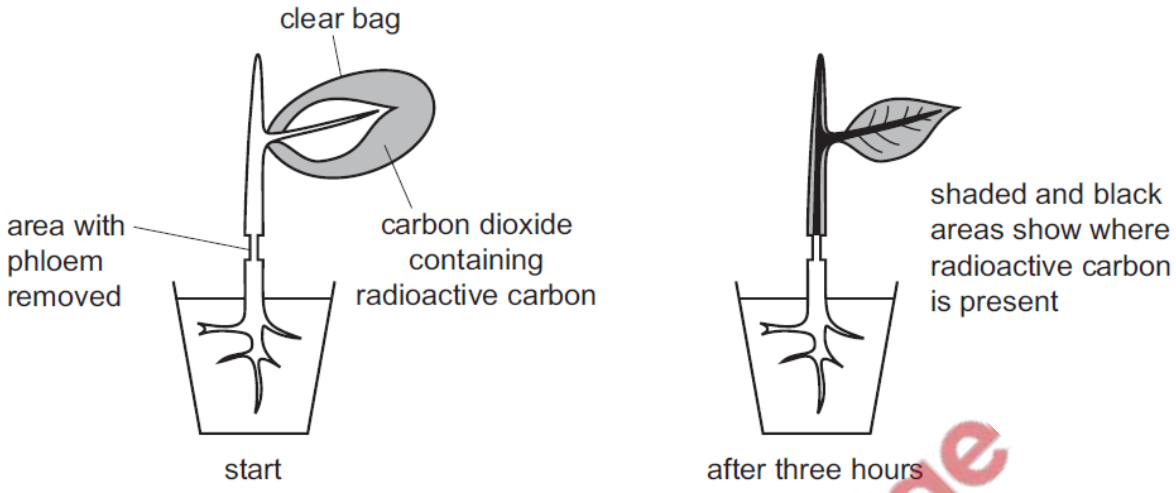


During transpiration, what describes the movement of water at X and at Y?

	movement of water at X	movement of water at Y
A	evaporation	diffusion
B	evaporation	osmosis
C	osmosis	diffusion
D	osmosis	osmosis

13. June/2021/Paper_23/No.18

A ring of phloem tissue was removed from the stem of a plant, as shown in the first diagram. Carbon dioxide containing radioactive carbon was supplied to the leaf of the plant. The second diagram shows where radioactive carbon was present after three hours.



Which statements does the experiment support?

1 Translocation of sugar only occurs in one direction.

2 Translocation occurs in the phloem.

3 Translocation requires energy.

A 1 only **B** 1 and 2 **C** 2 only **D** 2 and 3

14. June/2021/Paper_33/No.3

All living organisms need water. Most plants obtain water from the soil.

(a) (i) State the pathway taken by water as it enters and passes through a plant.

Use words from the list to fill in the spaces.

mesophyll cells **root cortex cells** **root hair cells** **xylem vessels**

enters ..... → ..... → ..... → .....

[2]

(ii) Some of the water that enters the plant is used for transpiration.

Define the term transpiration.

.....

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.....

.....

..... [3]

(iii) State **two** ways a plant uses water other than for transpiration.

1 .....

.....

2 .....

.....

[2]

(b) Fig. 3.1 shows apparatus that can be used to measure water loss in a plant.

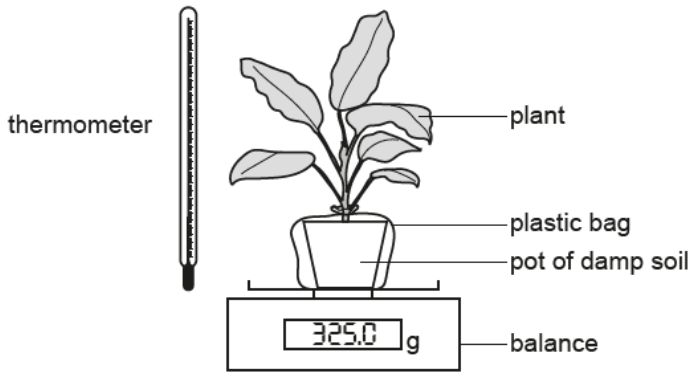

Fig. 3.1

Suggest a reason why the pot of damp soil was placed inside a sealed plastic bag.

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..... [1]

(c) The apparatus shown in Fig. 3.1 was used in an investigation. The results of this investigation are shown in Fig. 3.2.

Readings were taken at hourly intervals during the day between 9:00 and 16:00.

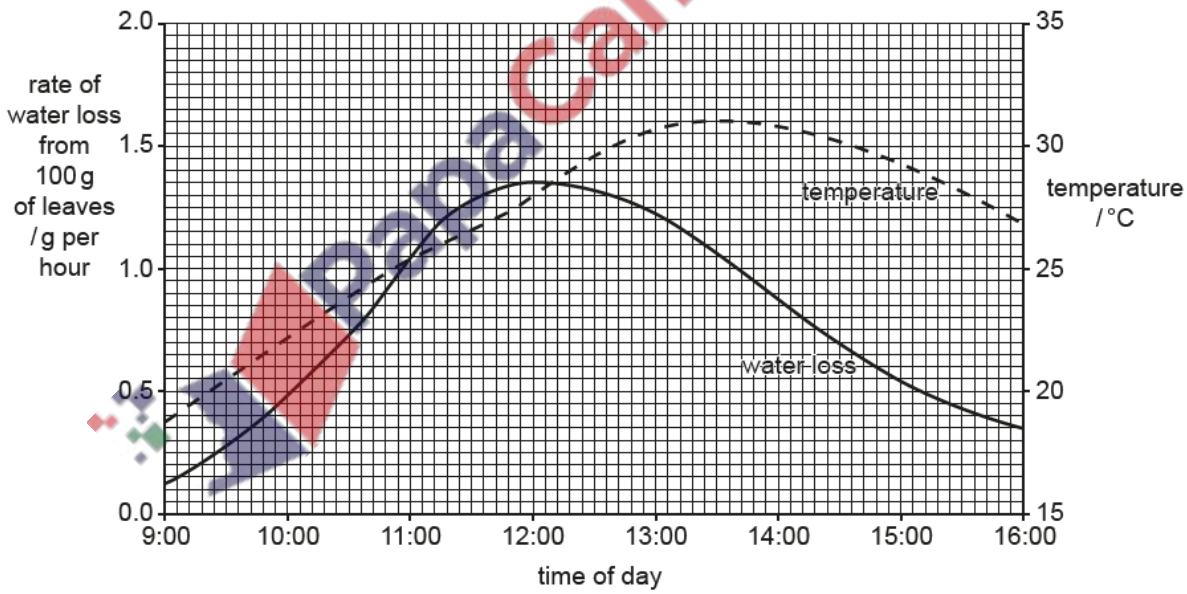

Fig. 3.2

(i) Use the information in Fig. 3.2 to state:

the maximum rate of water loss from 100 g of leaves ..... g per hour

the time at which the temperature was highest .....

the maximum temperature reached during the investigation ..... °C
[3]

(ii) Describe the relationship between temperature and the rate of water loss from leaves shown in Fig. 3.2.

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.....

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..... [3]

[Total: 14]

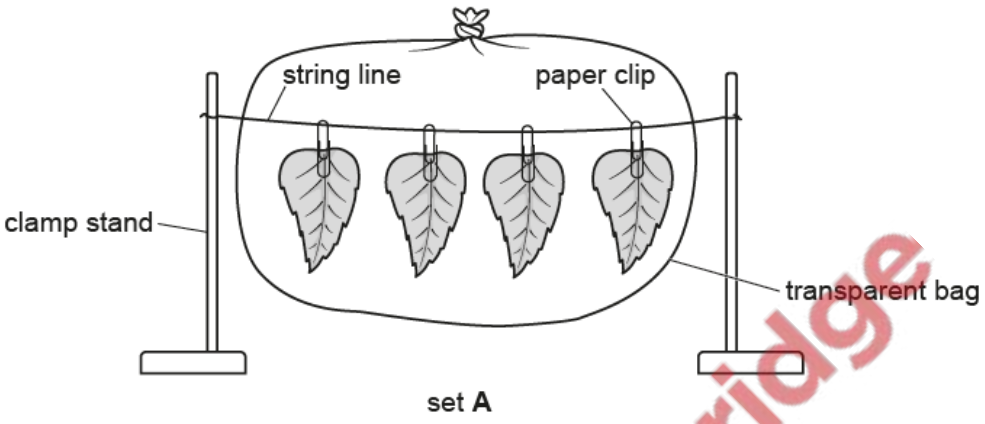
15. June/2021/Paper_42/No.6

(a) Some students set up the apparatus shown in Fig. 6.1 to compare transpiration in two sets of leaves.

Set **A** was kept in a transparent bag and set **B** was left in the open air.

All other conditions were kept constant.

The mass of the leaves in each set was measured at the start of the investigation and after five hours.



set **A**

set **B**

Fig. 6.1

(i) Predict the results for this investigation.

Explain the reason for your prediction.

prediction .....

.....

explanation .....

.....

.....

[3]

(ii) Explain how transpiration occurred in the leaves shown in Fig. 6.1.

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..... [3]

(iii) The students needed two additional pieces of apparatus to take measurements so that they could calculate the rate of transpiration from their results.

State the **two** additional pieces of apparatus the students needed to take the measurements.

1 .....

2 .....

[2]

(b) Fig. 6.2 shows the positions of the different tissues in part of a dicotyledonous leaf.

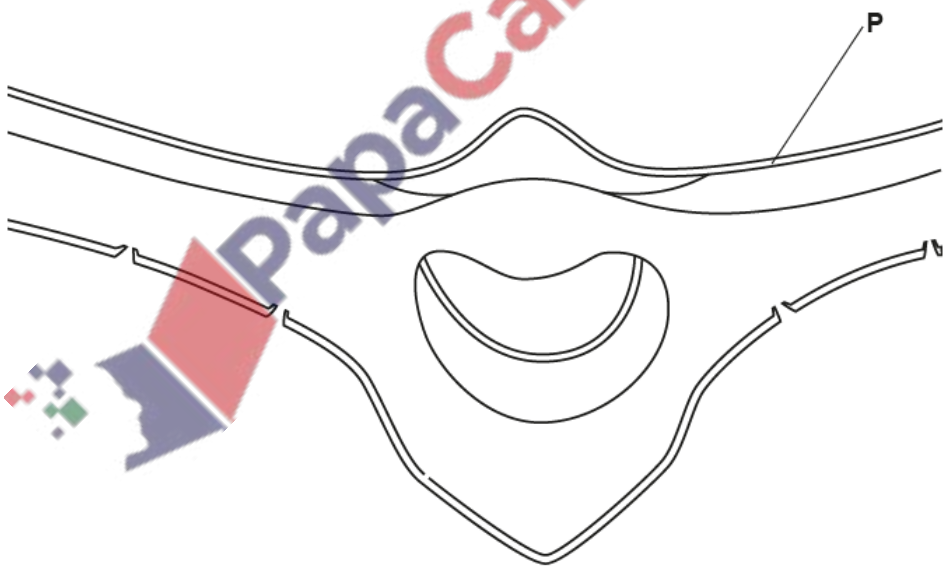

Fig. 6.2

Identify the tissues described in Table 6.1 by:

- drawing label lines with the corresponding letter on Fig. 6.2 **and**
- stating the name of each tissue in Table 6.1.

The label, line and name of the tissue for letter **P** has been completed for you on Fig. 6.2 and in Table 6.1.

Table 6.1

letter	description	name of the tissue
P	a protective transparent layer that allows light to reach the inner tissues	upper epidermis
Q	conducts water from the stem	
R	contains many interconnected air spaces	
S	transports sucrose and amino acids	
T	traps the most light energy to synthesise carbohydrates	

[4]

[Total: 12]