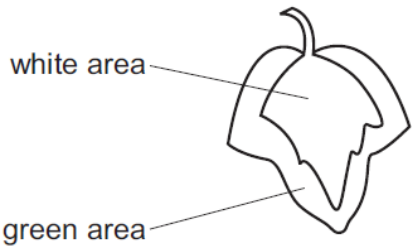
Plant nutrition – 2021 IGCSE 0610

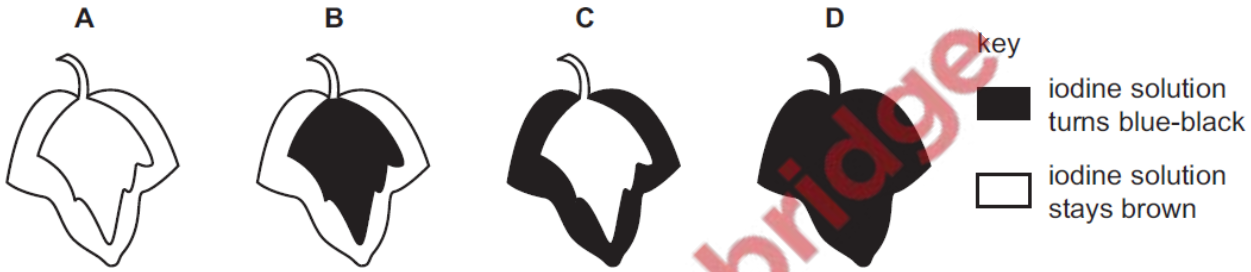
1. Nov/2021/Paper_11/No.9

In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.



Which diagram shows the result of the experiment?



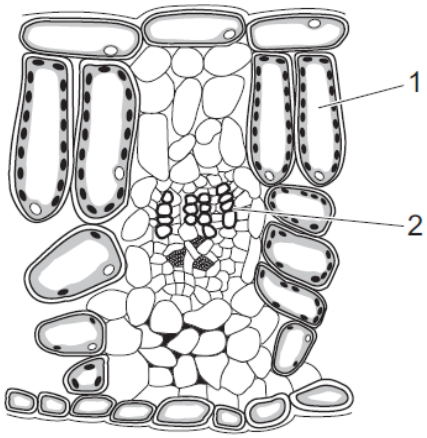
2. Nov/2021/Paper_11/No.12

Which row shows the raw materials needed for photosynthesis and the products of photosynthesis?

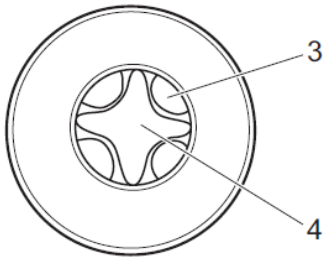
	raw materials	products
A	water + chlorophyll	carbon dioxide + glucose
B	carbon dioxide + water	chlorophyll + oxygen
C	oxygen + carbon dioxide	water + glucose
D	water + carbon dioxide	glucose + oxygen

3. Nov/2021/Paper_11/No.17

The diagrams show sections of a leaf and a root.



section of a leaf



not to scale

section through a root

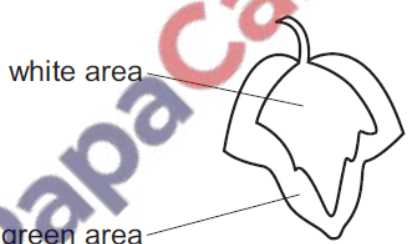
Which two labelled structures identify xylem?

A 1 and 4 **B** 2 and 3 **C** 1 and 3 **D** 2 and 4

4. Nov/2021/Paper_12/No.9

In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.



Which diagram shows the result of the experiment?

A

B

C

D

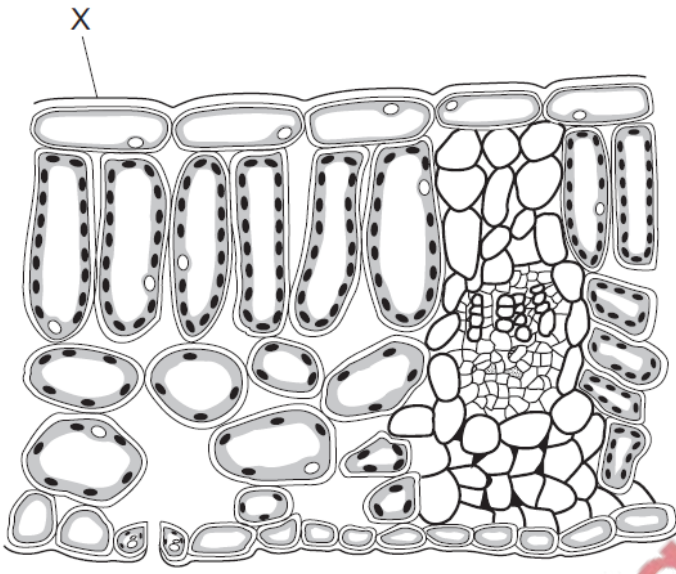
key

iodine solution turns blue-black

iodine solution stays brown

5. Nov/2021/Paper_12/No.12

The diagram shows a cross-section through a leaf.



What is the structure labelled X?

A cuticle

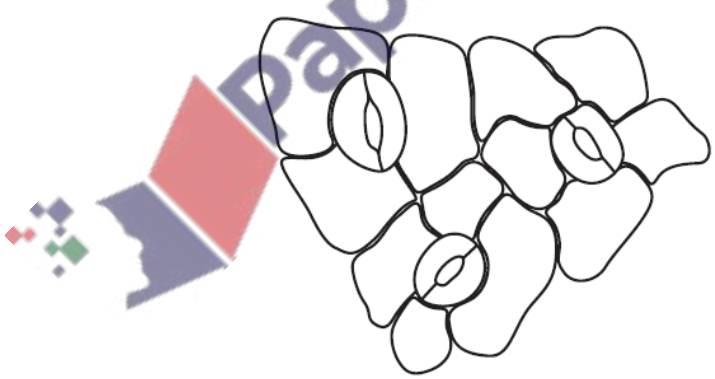
B palisade mesophyll

C spongy mesophyll

D stomata

6. Nov/2021/Paper_12/No.13

The diagram shows the surface view of part of the epidermis of a leaf.

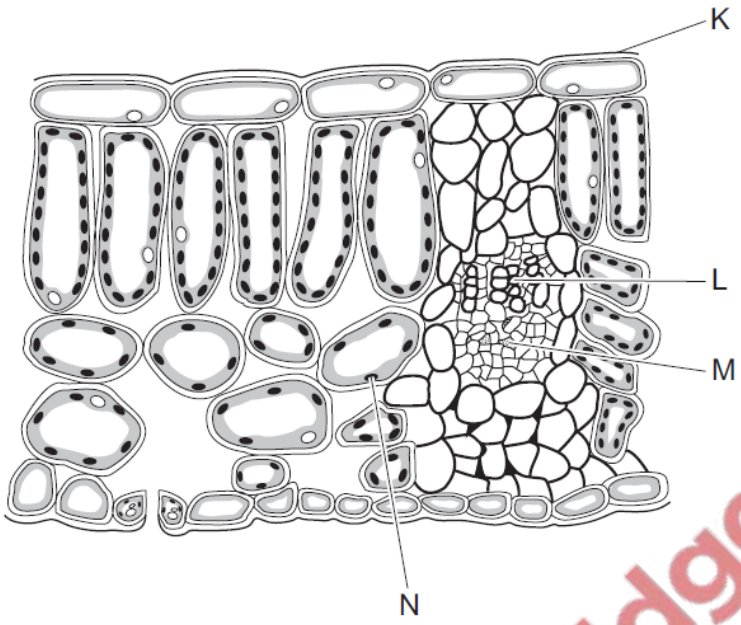


How many guard cells are present?

A 0 **B** 3 **C** 6 **D** 12

7. Nov/2021/Paper_13/No.12

The diagram shows a section through a leaf.



What are structures K, L, M and N?

	K	L	M	N
A	cuticle	phloem	xylem	spongy mesophyll
B	cuticle	xylem	phloem	spongy mesophyll
C	xylem	phloem	spongy mesophyll	cuticle
D	xylem	spongy mesophyll	cuticle	phloem

8. Nov/2021/Paper_13/No.17

By which method is water absorbed by root hair cells?

A active transport

B evaporation

C osmosis

D transpiration

9. Nov/2021/Paper_13/No.38

Which process releases carbon dioxide into the atmosphere?

A decomposition

B fossilisation

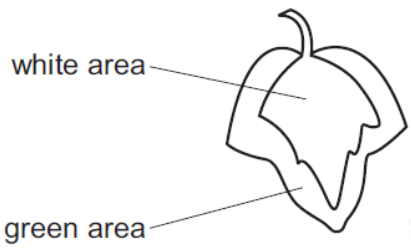
C photosynthesis

D transpiration

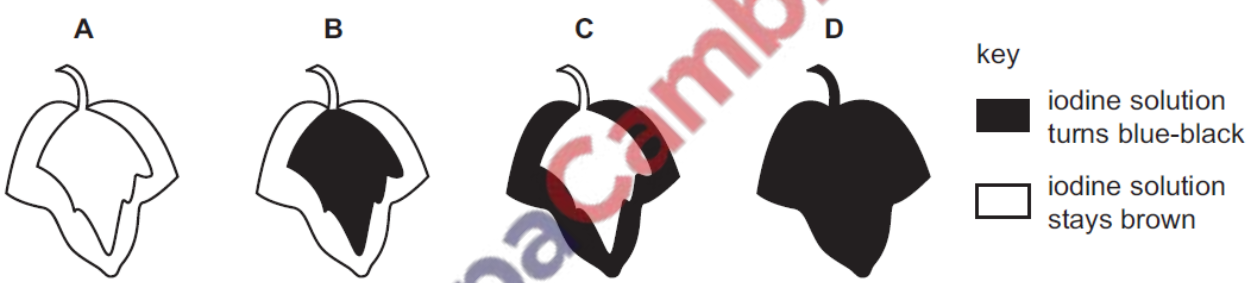
10. Nov/2021/Paper_21/No.9

In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.

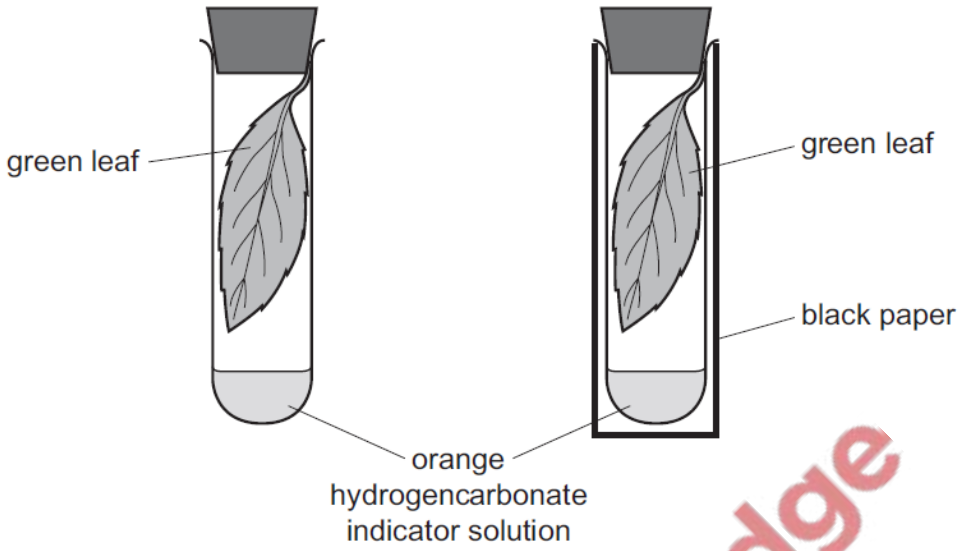


Which diagram shows the result of the experiment?



11. Nov/2021/Paper_21/No.12

Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.

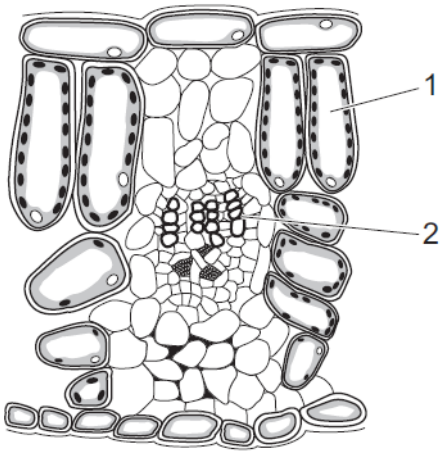


After a few hours, which colour would the hydrogencarbonate indicator solution be in each test-tube?

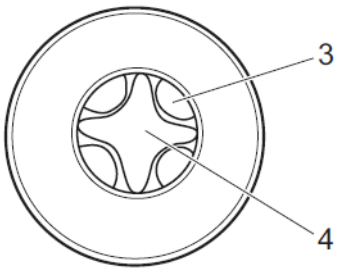
	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

12. Nov/2021/Paper_21/No.16

The diagrams show sections of a leaf and a root.



section of a leaf



section through a root

not to scale

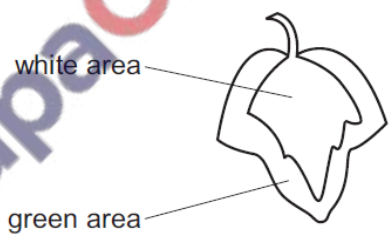
Which two labelled structures identify xylem?

A 1 and 4 **B** 2 and 3 **C** 1 and 3 **D** 2 and 4

13. Nov/2021/Paper_22/No.9

In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.



Which diagram shows the result of the experiment?

A

B

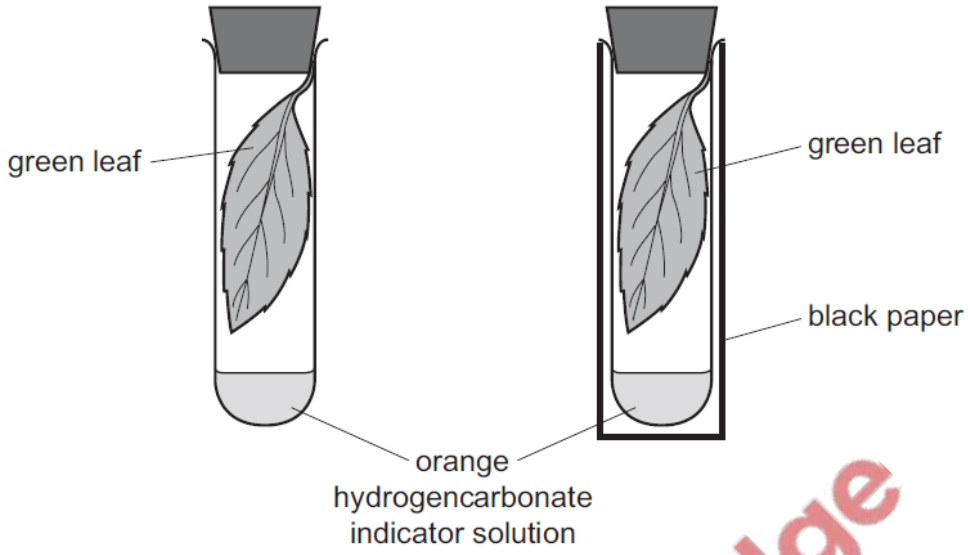
C

D

key

14. Nov/2021/Paper_22/No.12

Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.

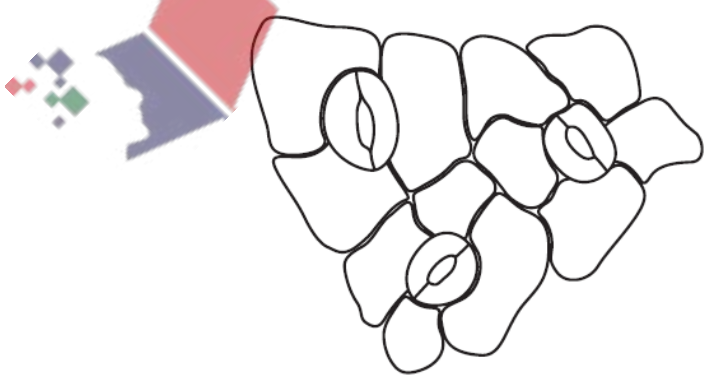


After a few hours, which colour would the hydrogencarbonate indicator solution be in each test-tube?

	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

15. Nov/2021/Paper_22/No.13

The diagram shows the surface view of part of the epidermis of a leaf.



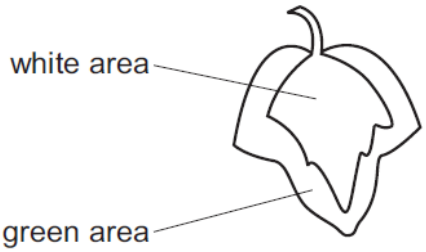
How many guard cells are present?

A 0 **B** 3 **C** 6 **D** 12

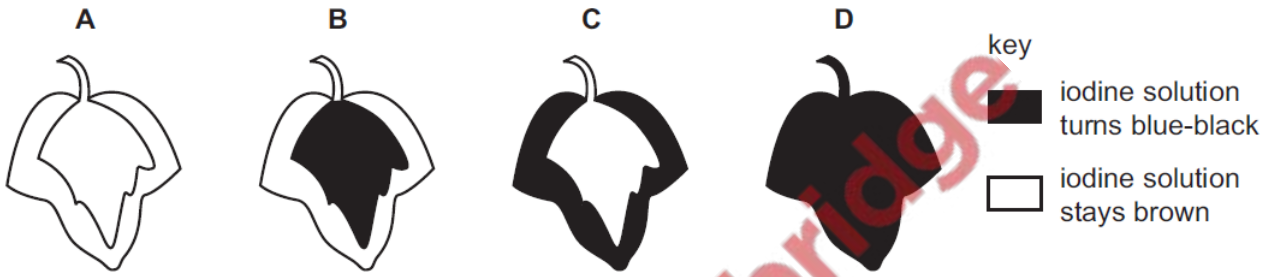
16. Nov/2021/Paper_23/No.9

In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.

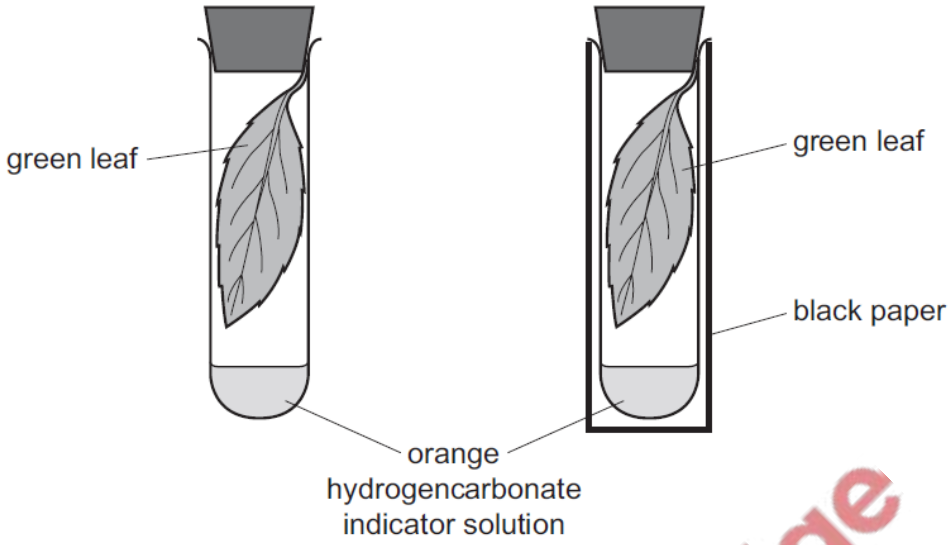


Which diagram shows the result of the experiment?



17. Nov/2021/Paper_23/No.12

Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.

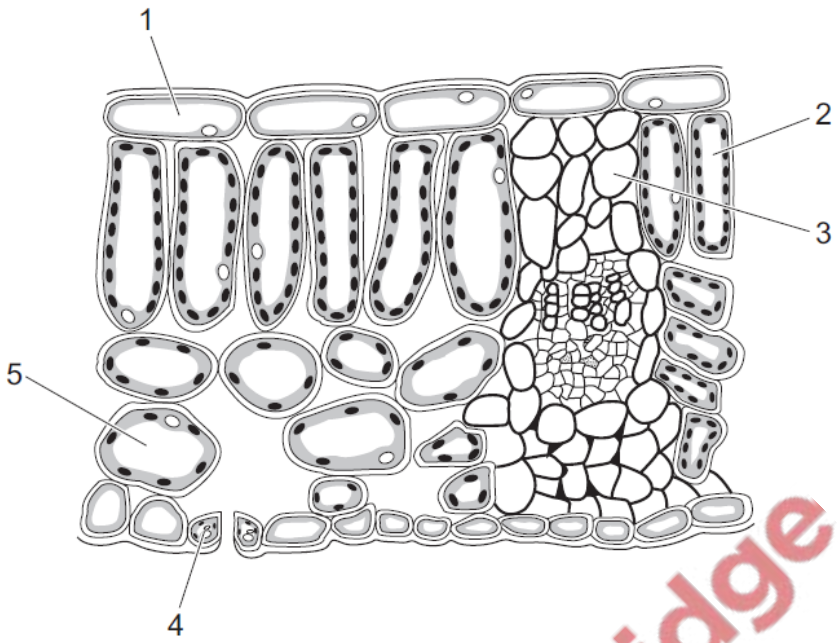


After a few hours, which colour would the hydrogencarbonate indicator solution be in each test-tube?

	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

18. Nov/2021/Paper_23/No.13

The diagram shows part of a leaf cross-section.



Which cells can carry out photosynthesis?

A 1, 2 and 3 **B** 2, 3 and 4 **C** 2, 4 and 5 **D** 1, 3 and 5

19. Nov/2021/Paper_33/No.3

(a) Fig. 3.1 shows a diagram of a cross-section through a leaf.

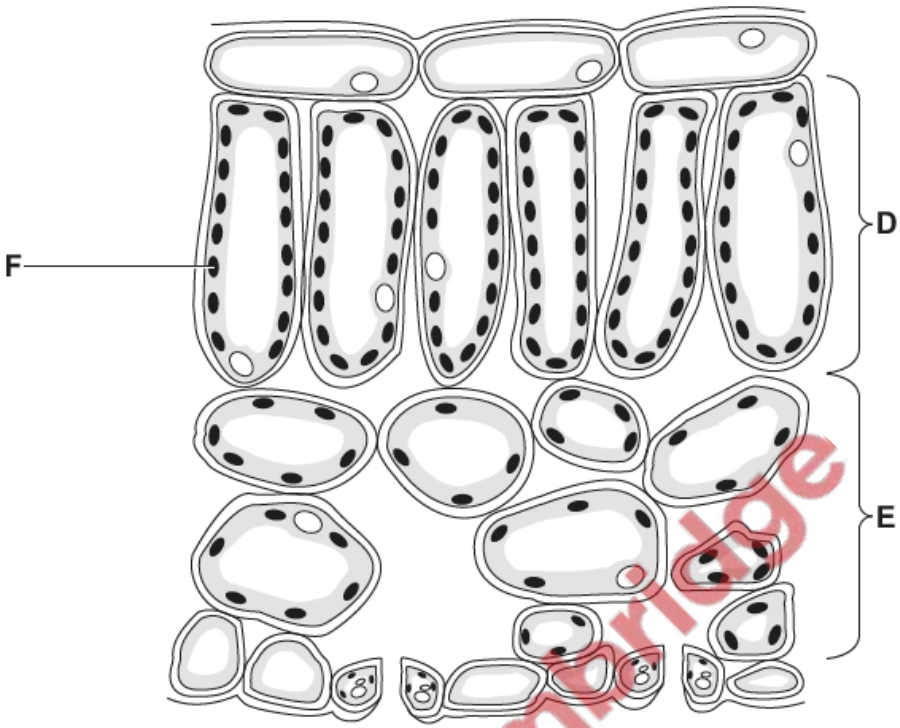


Fig. 3.1

(i) State the name of the tissues labelled **D** and **E**.

D .....

E .....

[2]

(ii) State the name of the cell structure labelled **F**.

..... [1]

(b) Plant cells photosynthesise.

State the word equation for photosynthesis.

..... [2]

(c) A student investigated the effect of light on the rate of photosynthesis.

Fig. 3.2 shows the apparatus used.

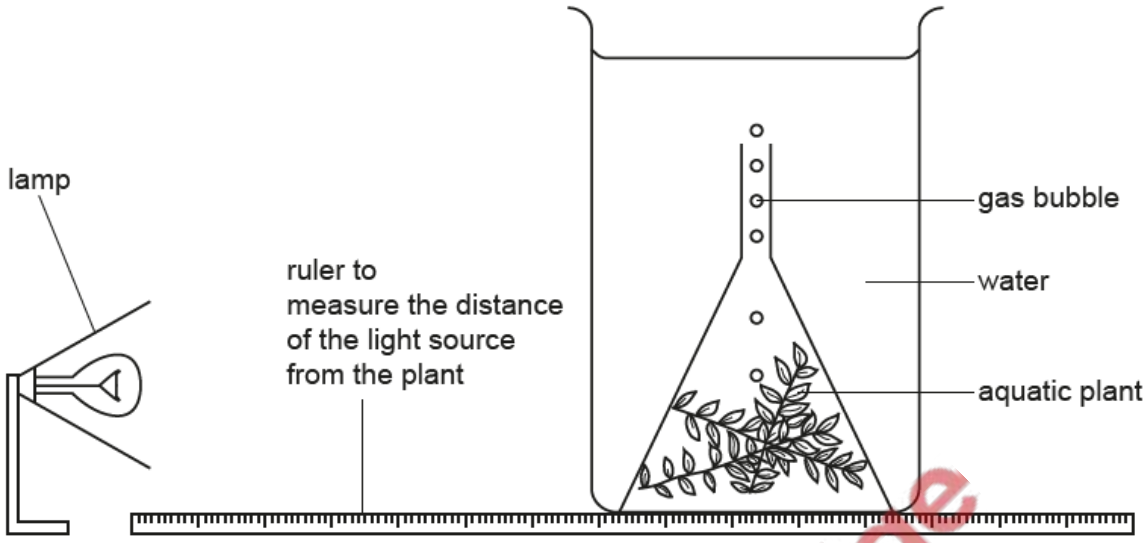


Fig. 3.2

A lamp was used as the only source of light. The lamp was placed 10 cm from the aquatic plant. The number of bubbles the aquatic plant produced in three minutes was counted and the rate of photosynthesis was calculated. This method was repeated at 10 cm intervals.

The results are shown in Table 3.1.

Table 3.1

distance of the lamp from the aquatic plant / cm	number of bubbles counted in three minutes	rate of photosynthesis / bubbles per minute
10	87	29
20	87	29
30	75	
40	48	16
50	24	8

(i) Use the information in Table 3.1 to calculate the rate of photosynthesis when the lamp was 30 cm from the aquatic plant.

..... bubbles per minute [1]

(ii) State the **two** distances between which the rate of photosynthesis halved.

..... cm and ..... cm [1]

(iii) State **two** distances which have the same rate of photosynthesis.

.....cm and .....cm [1]

(iv) Predict what would happen to the rate of photosynthesis if the lamp was switched off.

Give a reason for your answer.

prediction .....

.....

reason .....

.....

.....

[2]

[Total: 10]

20. Nov/2021/Paper_43/No.2

Fig. 2.1 is a photomicrograph of the end of a plant root.

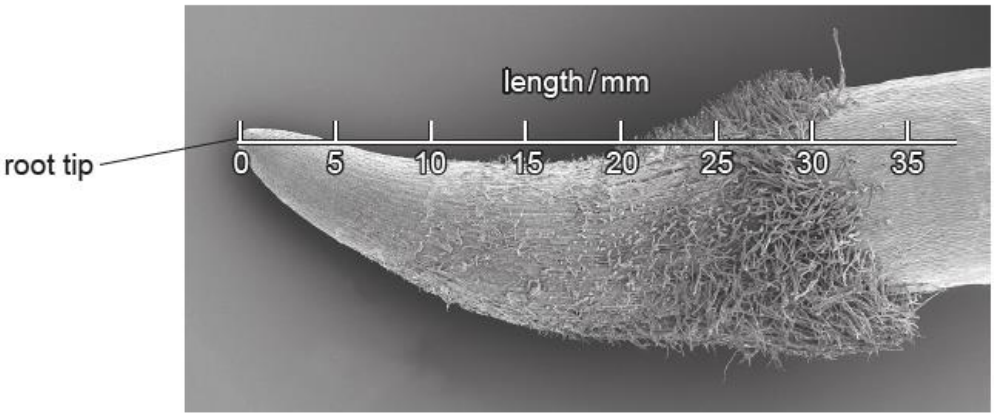


Fig. 2.1

Fig. 2.2 shows the results of a study on the rate of uptake of nitrate ions at different points along the root shown in Fig. 2.1.

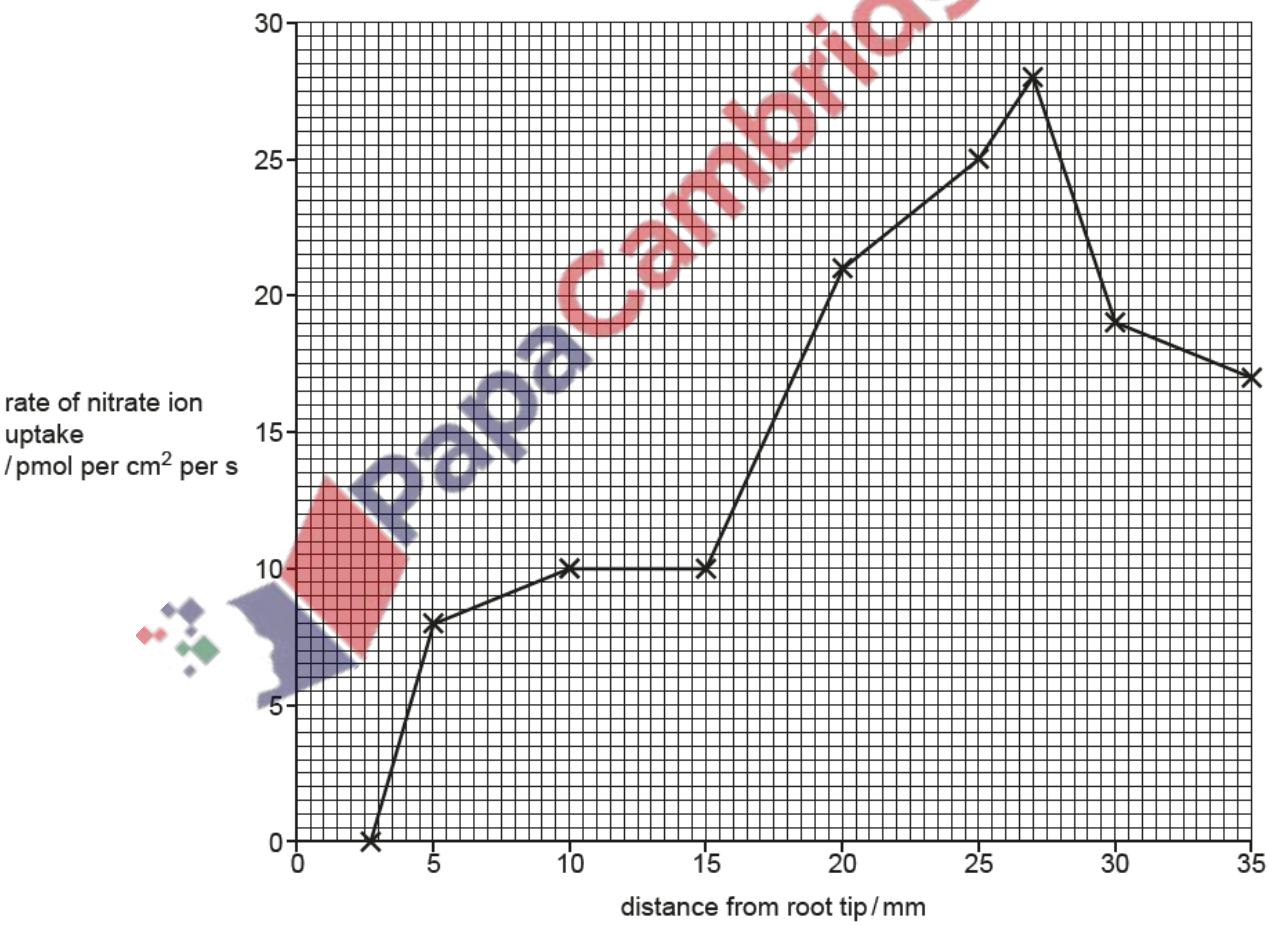


Fig. 2.2

(a) (i) Describe the rate of uptake of nitrate ions along the root.

Use the information in Fig. 2.1 and Fig. 2.2 in your answer.

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..... [5]

(ii) Explain how nitrate ions move from the soil into roots.

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..... [4]

(iii) Explain why the uptake of ions, such as nitrate, is important for the uptake of water in roots.

.....

.....

..... [1]

(iv) Explain why plants need nitrate ions, **other than** for the uptake of water.

.....

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..... [3]

(v) Describe how nitrate ions are formed in the soil.

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.....

.....

..... [3]

(b) **(i)** Fig. 2.3 shows some of the events that occur when high concentrations of nitrate ions flow into lakes.

A	a decrease in the concentration of dissolved oxygen
B	a decrease in the population of consumers
C	a decrease in the population of producers
D	a decrease in light intensity at the bottom of the lake
E	an increase in the population of decomposers
F	an increase in the population of producers

Fig. 2.3

Put the events shown in Fig. 2.3 into the correct sequence.

[2]

(ii) State the name of the process summarised in Fig. 2.3.

..... [1]

[Total: 19]