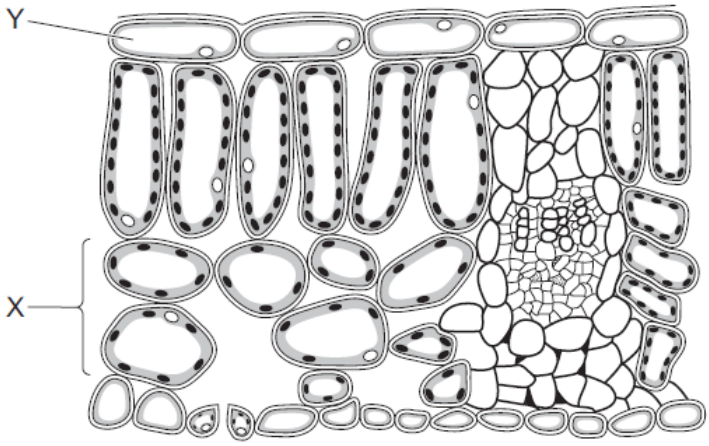
Plant nutrition – 2020 IGCSE 0610

1. Nov/2020/Paper_11/No.13

The diagram shows a section through a leaf.

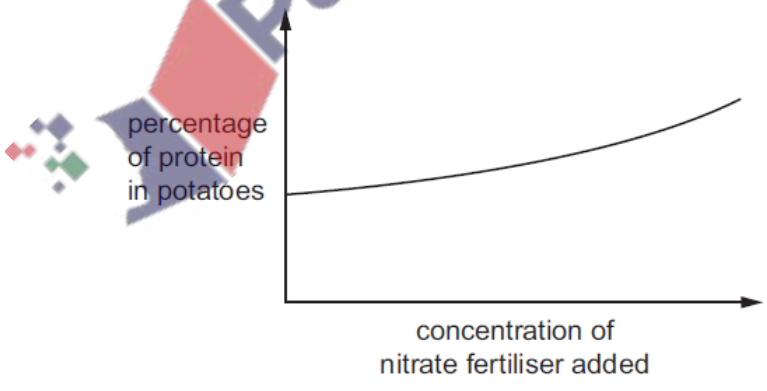


Which row correctly identifies tissues X and Y?

	X	Y
A	palisade mesophyll	cuticle
B	palisade mesophyll	upper epidermis
C	spongy mesophyll	cuticle
D	spongy mesophyll	upper epidermis

2. Nov/2020/Paper_12/No.13

The graph shows how the percentage of protein found in potatoes was affected by the concentration of nitrate fertiliser added to the crop when it was growing.



These results suggest that greater concentrations of nitrate fertiliser allow the potatoes to make more

A amino acids.

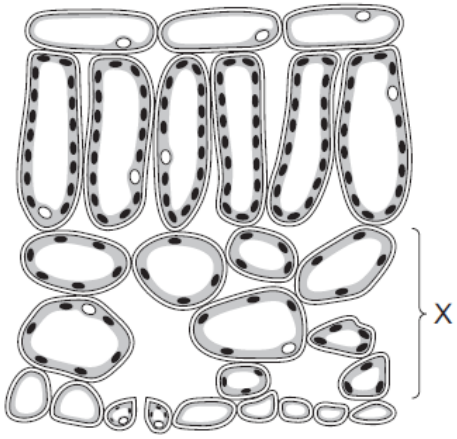
B cellulose.

C lipid.

D starch.

3. Nov/2020/Paper_13/No.13

The diagram shows part of a leaf.



What is layer X?

A lower epidermis

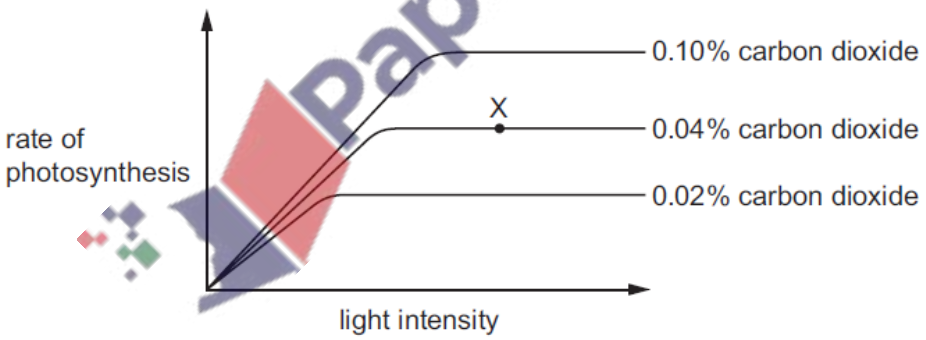
B palisade mesophyll

C spongy mesophyll

D vascular bundle

4. Nov/2020/Paper_21/No.11

The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

A carbon dioxide concentration

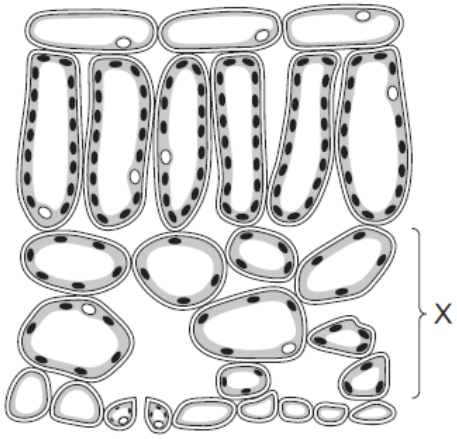
B light intensity

C surface area of the plant

D temperature

5. Nov/2020/Paper_21/No.12

The diagram shows part of a leaf.



What is layer X?

A lower epidermis

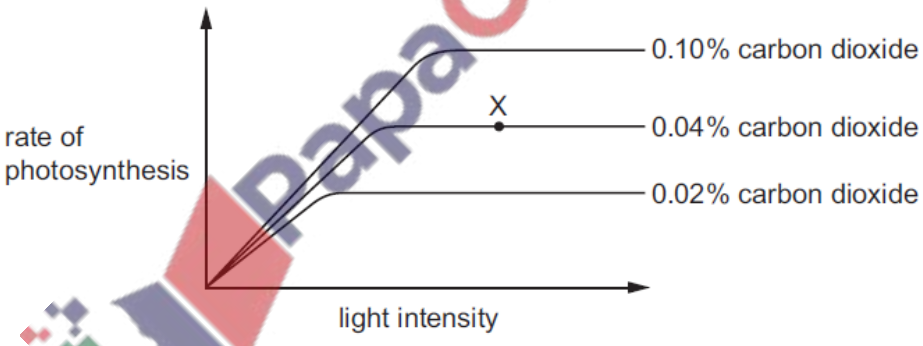
B palisade mesophyll

C spongy mesophyll

D vascular bundle

6. Nov/2020/Paper_22/No.11

The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

A carbon dioxide concentration

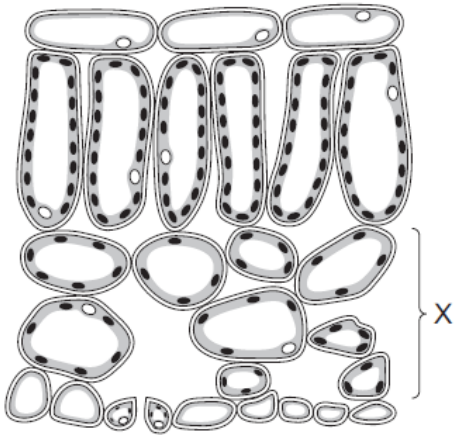
B light intensity

C surface area of the plant

D temperature

7. Nov/2020/Paper_22/No.12

The diagram shows part of a leaf.



What is layer X?

A lower epidermis

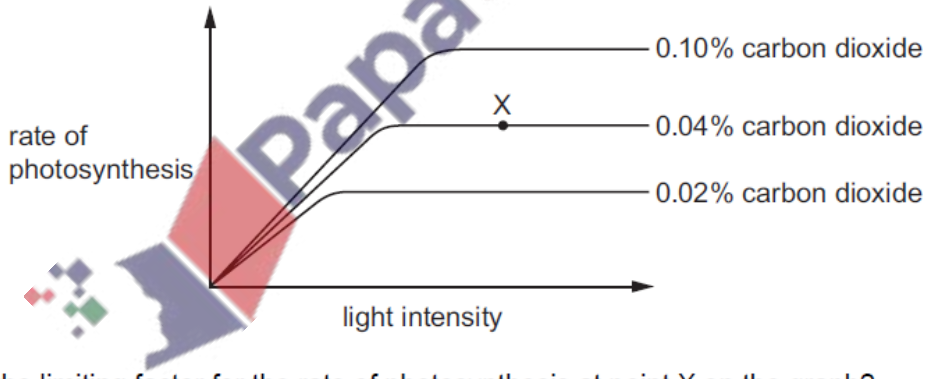
B palisade mesophyll

C spongy mesophyll

D vascular bundle

8. Nov/2020/Paper_23/No.11

The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

A carbon dioxide concentration

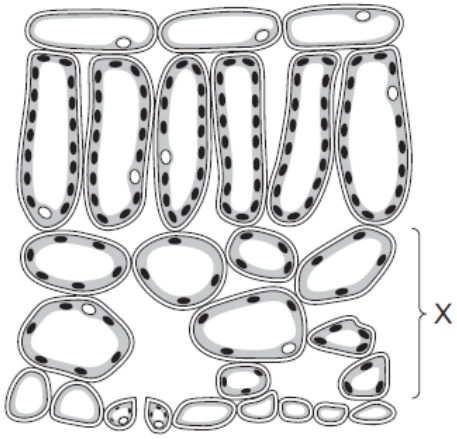
B light intensity

C surface area of the plant

D temperature

9. Nov/2020/Paper_23/No.12

The diagram shows part of a leaf.



What is layer X?

A lower epidermis

B palisade mesophyll

C spongy mesophyll

D vascular bundle

10. Nov/2020/Paper_32/No.8

Plants carry out photosynthesis.

(a) State the names of **two** substances produced by photosynthesis.

1 .....

2 .....

[2]

(b) A student investigated how temperature affects the rate of photosynthesis. The concentration of carbon dioxide was kept constant during the investigation.

The results are shown in Fig. 8.1.

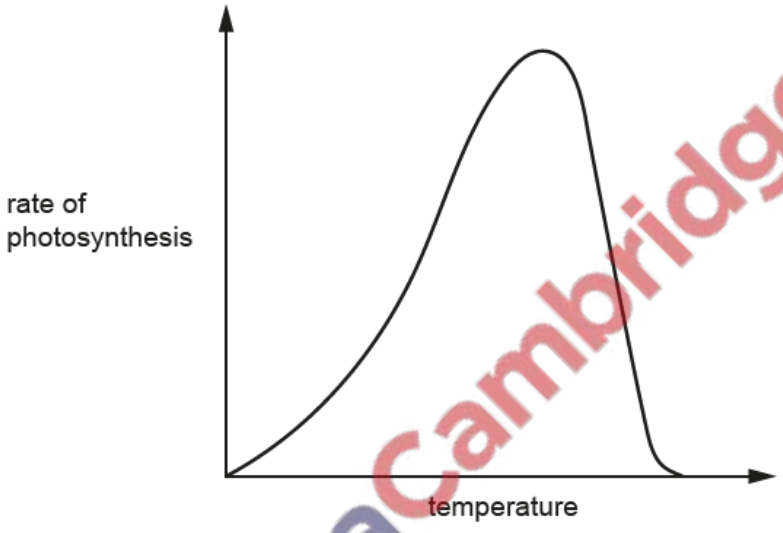


Fig. 8.1

(i) Predict how the rate of photosynthesis will change when carbon dioxide concentration increases and the temperature is kept constant at 20 °C.

.....

.....

..... [1]

(ii) State **one** factor other than temperature and carbon dioxide concentration that will affect the rate of photosynthesis.

..... [1]

(c) In another investigation students used a plant which had variegated leaves.

One of the leaves from this plant is shown in Fig. 8.2.

Fig. 8.2

Complete Table 8.1 to show where the processes of photosynthesis and respiration occurred in this variegated leaf when the plant was in the light.

Place a tick (✓) in each correct box.

Table 8.1

process	area **A**	area **B**
photosynthesis		
respiration		

[2]

(d) Cells in the mesophyll layers of a leaf carry out photosynthesis.

State the names of **two** leaf layers that light must pass through to reach the spongy mesophyll cells.

1 .....

2 .....

[2]

(e) Plants absorb mineral ions from the soil.

(i) State the name of the tissue that transports mineral ions in plants.

..... [1]

(ii) State the name of the mineral ion that is used to make chlorophyll.

..... [1]

(iii) State the name of the mineral ion that is used to make amino acids.

..... [1]

(f) Plants are involved in nutrient cycles in ecosystems.

Describe the role of plants in the carbon cycle and the water cycle.

.....

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.....

.....

..... [4]

[Total: 15]

11. Nov/2020/Paper_33/No.1

(a) Fig. 1.1 is a photograph of a strawberry plant growing in a glasshouse. It photosynthesises and produces fruit.

Fig. 1.1

(i) State the names of the products of photosynthesis.

..... [1]

(ii) State the name of the structure in plant cells which contains chlorophyll.

..... [1]

(b) Scientists investigated the effect of carbon dioxide concentration on the rate of photosynthesis of strawberry plants grown in a glasshouse.

Fig. 1.2 is a graph of the results of the investigation.

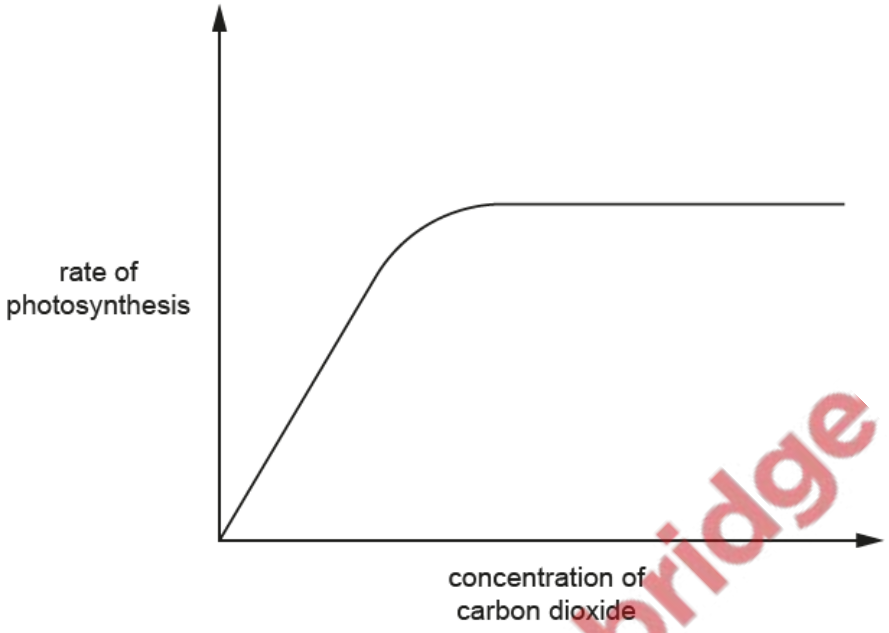

Fig. 1.2

(i) Describe the trend shown in the graph in Fig. 1.2.

.....

.....

..... [1]

(ii) The investigation on the effect of carbon dioxide concentration on the rate of photosynthesis was repeated at a higher light intensity.

Sketch, **on the graph in Fig. 1.2**, a second line to show the expected results of this second investigation. [2]

(iii) Place ticks (✓) in the correct boxes to identify **three** substances or conditions that would be supplied to the strawberry plants to maximise photosynthesis.

glucose	
lipase	
magnesium ions	
warm temperature	
water	
very low light intensity	

[3]

(c) Plants are an important part of the water cycle.

Fig. 1.3 is a diagram of the water cycle.

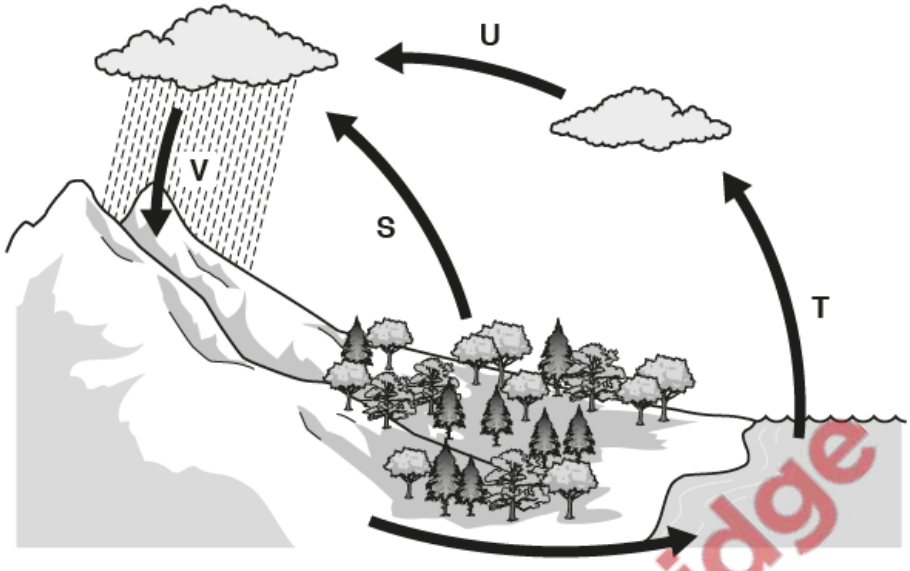

Fig. 1.3

Table 1.1 shows the letters from Fig. 1.3, and descriptions of the stages in the water cycle.

Complete Table 1.1 by writing the name of each stage in the correct boxes.

Table 1.1

letter from Fig. 1.3	name of stage	description of stage
S		loss of water vapour from plant leaves
T		heat from the Sun causes liquid water to change into water vapour
U		water vapour in the air changes to liquid water in the clouds
V		the liquid water falls to the ground

[4]

[Total: 12]

12. Nov/2020/Paper_41/No.1

Water is an essential molecule for life.

(a) Complete the statements.

Water moves into and out of cells by ..... .

Water is known as a ..... because it can dissolve solutes.

[2]

(b) A leaf cell was put into a solution. The water potential of the solution was lower than the water potential of the contents of the cell.

Fig. 1.1 is a sketch of the cell after three hours in the solution.

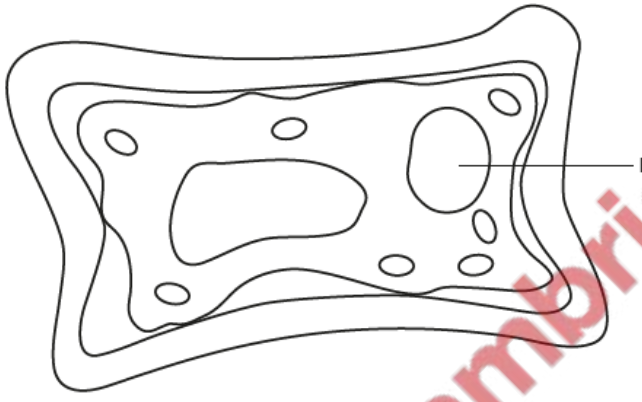

Fig. 1.1

The leaf cell was transferred into pure water.

Sketch the expected appearance of the cell after it had been in the pure water for three hours.

Draw **one** arrow on your sketch to show the direction of water movement.

[3]

(c) A plant was **not** watered for one week.

Fig. 1.2 shows a series of photographs of the plant during the week.

day 0 day 3 day 7

Fig. 1.2

Explain how the lack of water has affected the support of the leaves of the plant shown in Fig. 1.2.

Use the term *turgor pressure* in your answer.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 8]