

Plants and photosynthesis/plants for food

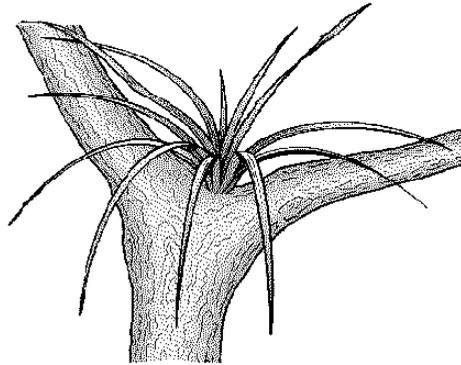
9C & 9D

31 min

33 marks

Q1-L4, Q2-L5, Q3-L5, Q4-L6, Q5-L6

1. The drawing shows a plant called Tillandsia.

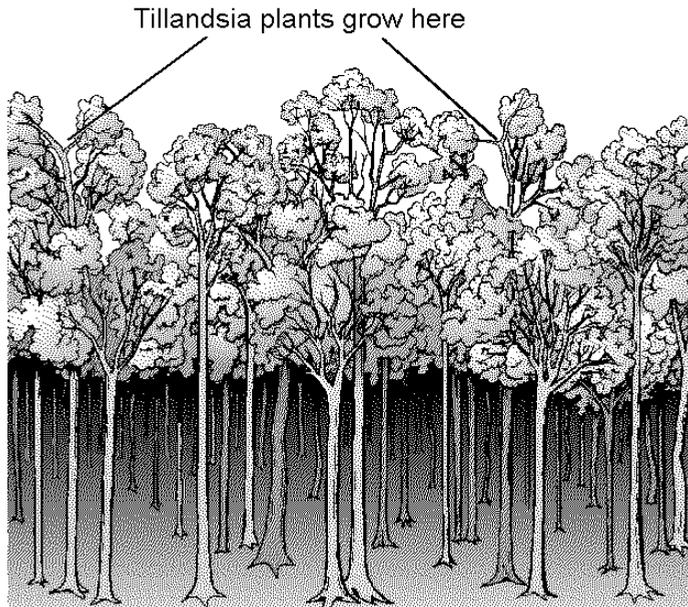


- (a) (i) The leaves of this plant absorb light.
Why do plants need light?

.....

1 mark

(ii) Tillandsia plants grow on the high branches of trees in rain forests.



not to scale

These plants **cannot** grow well on the lowest branches.
Explain why.

.....
.....

1 mark

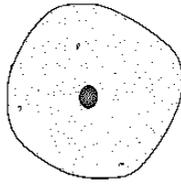
(b) Tillandsia plants do **not** have root hairs on their roots.

What **two** substances do most plants absorb through their root hairs?

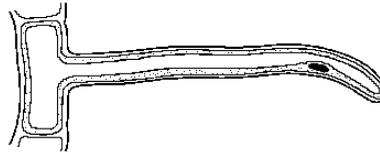
1.
2.

2 marks

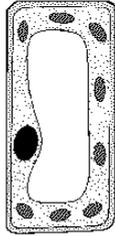
- (c) Which diagram below shows a root hair?
Tick the correct box.



A



B



C



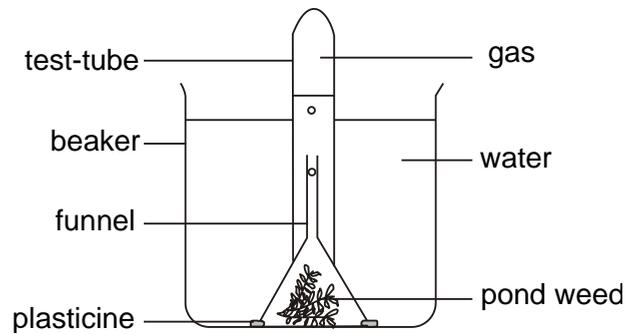
D

not to scale

1 mark

Maximum 5 marks

2. The drawing shows an experiment to investigate photosynthesis in weed from a pond.



Bubbles of gas produced during photosynthesis were given off from the pond weed and collected in the test tube.

- (a) Name the gas given off in photosynthesis

.....

1 mark

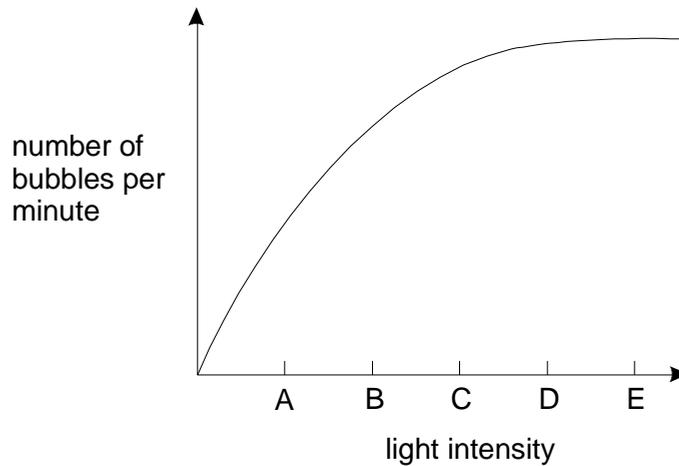
(b) What **two** substances are taken in by the plant and used for photosynthesis?

1.

2.

2 marks

Light of different intensities was shone onto the pond weed. The number of gas bubbles given off in one minute at each light intensity was counted. The results are shown in the graph.



(c) Which letter on the horizontal axis shows the light intensity at which the rate of photosynthesis first reaches its maximum?

.....

1 mark

Blue, green and red light were then shone, in turn, onto the pond weed. The number of bubbles of the gas given off in one minute was counted. The results are shown in the table.

colour of light	number of bubbles in one minute
blue	85
green	10
red	68

The leaves of the pond weed contain a green pigment which absorbs light for photosynthesis

(d) (i) Name this pigment.

.....

1 mark

(ii) Using the information in the table, tick a box by **one** colour of light which is strongly absorbed by the pigment.

blue

green

red

1 mark

(e) Sugar is also produced during photosynthesis.

Give **two** ways in which the plant uses sugar.

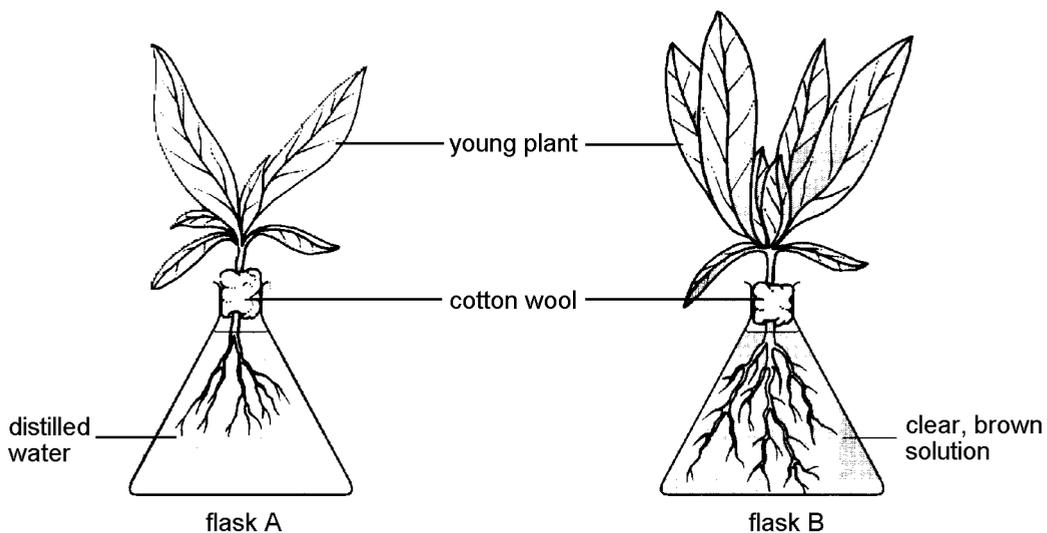
1.
.....
2.
.....

2 marks

Maximum 8 marks

3. Plants take in water from the soil. Lisa did an experiment to find out if there is anything else in soil that plants need for growth.

The diagrams below show the results of Lisa's experiment.



Lisa made the clear, brown solution in flask B by shaking a mixture of soil and water and then separating the solution from the soil particles.

(a) How could Lisa separate the brown solution from the soil particles?

.....

1 mark

(b) Explain why Lisa grew one plant in distilled water.

.....

.....

1 mark

(c) (i) What type of substance, dissolved in the water in flask B, is used by the plant for growth?

.....

1 mark

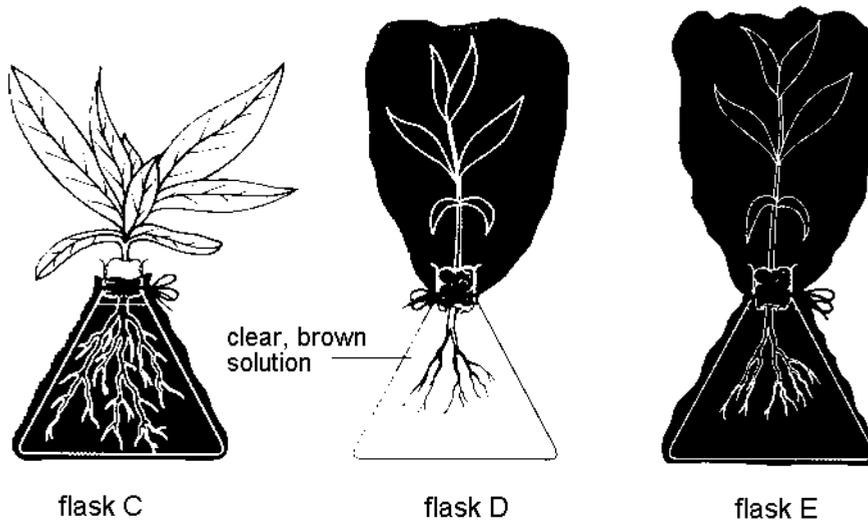
(ii) How are roots adapted for taking in water?

.....

.....

1 mark

(d) Lisa set up a second experiment using three similar plants. The solution in flasks C, D and E was the same. She put all three flasks in a sunny position. The diagrams below show the results of Lisa's second experiment.



the flask containing the clear, brown solution is wrapped in black paper

stem and leaves are wrapped in black paper

stem and leaves and the flask containing the clear, brown solution are wrapped in black paper

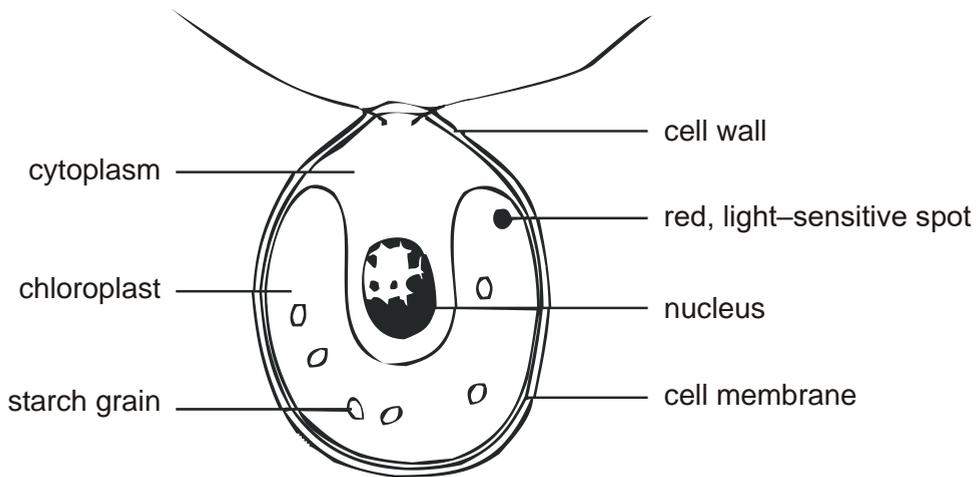
The plant in flask C was the only one which grew well in this experiment.
Explain why.

.....
.....

1 mark

Maximum 5 marks

4. The diagram below shows a single-cell organism called Chlamydomonas. It lives in pond water.



Use the information in the diagram to help you answer the questions below.

- (a) Give **two** features of Chlamydomonas which show that it is more like a plant cell than an animal cell.

1.
2.

2 marks

- (b) Chlamydomonas makes a sugar called glucose.

- (i) Give the name of the process in which Chlamydomonas makes glucose.

.....

1 mark

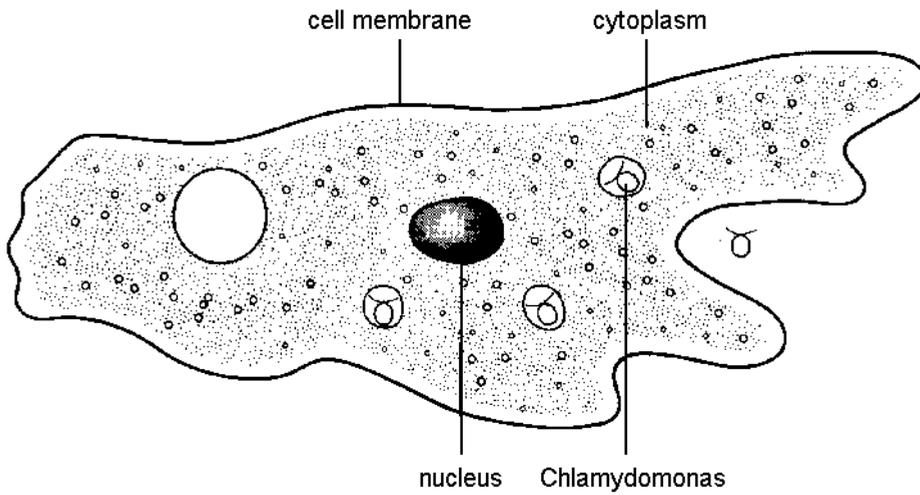
- (ii) Chlamydomonas produces starch grains from glucose.

Suggest what will happen to the number of starch grains in the cell if Chlamydomonas is kept in the dark.

.....

1 mark

- (c) The diagram below shows another single-cell organism called Amoeba. It also lives in pond water. Amoeba traps a Chlamydomonas and digests it.



not to scale

Starch is a carbohydrate. Amoeba's digestive enzymes break down the starch in the Chlamydomonas.

Suggest what substance is produced from the starch and what it is used for.

.....

.....

.....

2 marks

Maximum 6 marks

5. The drawing shows part of a blackberry plant.



- (a) Photosynthesis takes place in the leaves of the blackberry plant. Complete the word equation for photosynthesis.

water + carbon dioxide → + oxygen

1 mark

- (b) Jonathan studied a blackberry plant growing in a shady place and a blackberry

plant growing in a sunny place.

- (i) Jonathan found that the plant in the shady place had larger leaves. Why is it an advantage for plants in the shade to have leaves with a large surface area?

.....

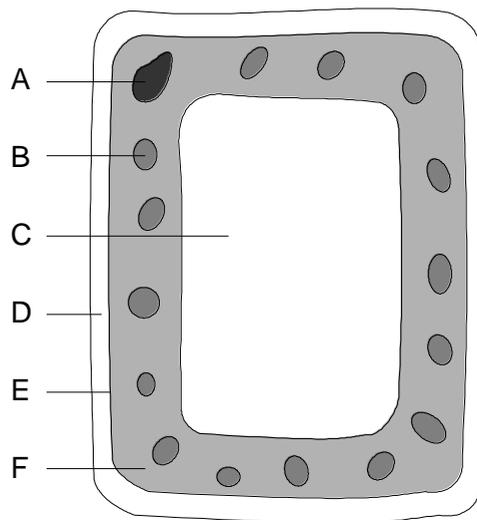
1 mark

- (ii) Both blackberry plants had green leaves. What part of the leaf cells makes the leaf green?

.....

1 mark

- (c) The diagram below shows a cell from a leaf of a blackberry plant.



The names of four parts of the cell are listed in the table below.

- (i) Match the name of each part with a letter from the diagram. Write your answers in the table.

part	letter of part
cell wall	
cytoplasm	
nucleus	
vacuole	

4 marks

- (ii) Which **two** of the labelled parts are also present in an animal cell? Give the correct letters from the diagram.

..... and

2 marks

Maximum 9 marks