Material cycles and energy
Photosynthesis

Total mark – 16

Question: 1

1 Green plants make their own food.

1 (a) (i) What is the name of the process that plants use to make food?

[1 mark]

Draw a ring around the correct answer.

digestion **growth** **photosynthesis** **respiration**

1 (a) (ii) Plants need energy to make food.

Where does this energy come from?

[1 mark]

Draw a ring around the correct answer.

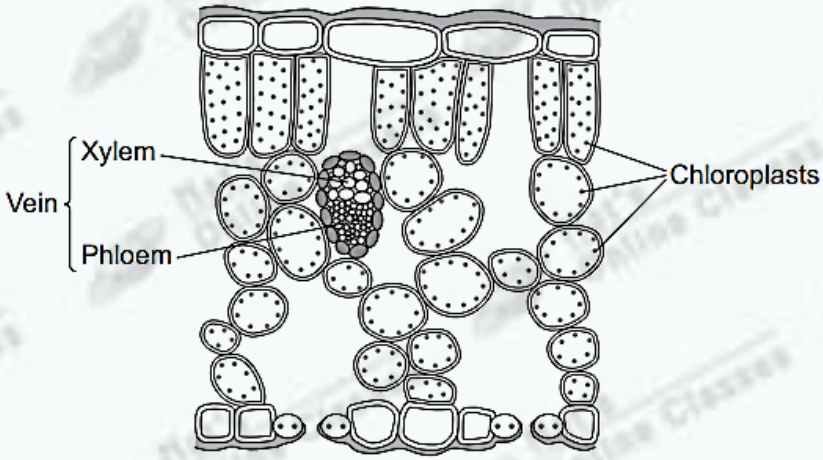
light **oxygen** **soil** **water**

1 (b) In plants, most of the food is made by the leaves.

Figure 1 shows a section through a plant leaf.

In the leaf, many of the cells contain chloroplasts.

Figure 1



1 (b) (i) Chloroplasts contain a green substance.

Name this green substance.

[1 mark]

_____

1 (b) (ii) How does this green substance help chloroplasts to make food?

[1 mark]

_____

_____

1 (b) (iii) What is the function of the vein shown in **Figure 1**?

[1 mark]

_____

_____

1 (b) (iv) Plants make glucose.

Name **two** substances a plant must take in to make glucose.

[2 marks]

1 _____

2 _____

Question: 2

2 Substances travel from the soil into plant roots by different processes.

2 (a) One of these processes is osmosis.

What is the definition of osmosis?

[1 mark]

Tick (✓) **one** box.

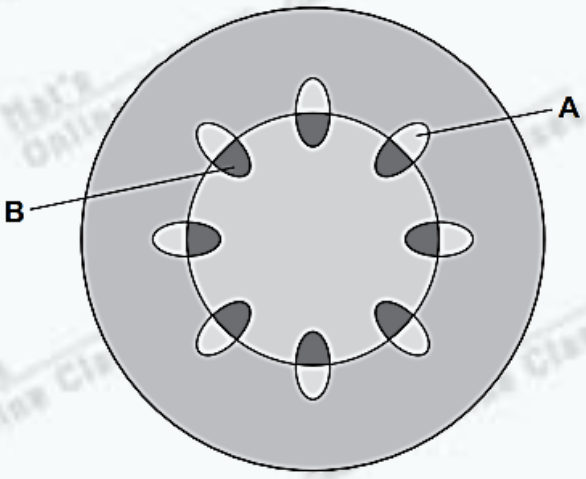
The movement of water from a concentrated solution to a more dilute solution through a partially permeable membrane. ☐

The movement of water from a dilute solution to a more concentrated solution through a partially permeable membrane. ☐

The movement of water through a partially permeable membrane using energy. ☐

2 (b) **Figure 2** shows a cross-section through a plant stem.

Figure 2



Parts **A** and **B** in **Figure 2** contain tubes that transport materials in plants.

A student collected fluid from parts **A** and **B**.

The fluid from **A** contained a lot of sugar.

The fluid from **B** contained a lot of mineral ions.

What are the names of parts **A** and **B** in **Figure 2**?

[2 marks]

Use the correct answers from the box.

guard cells	**phloem**	**stomata**	**storage organ**	**xylem**

A _____

B _____

2 (c) In plants water moves from the roots, up through the stem and out of the leaves.

What is the name of this movement of water?

[1 mark]

Complete the sentence.

The _____ stream.

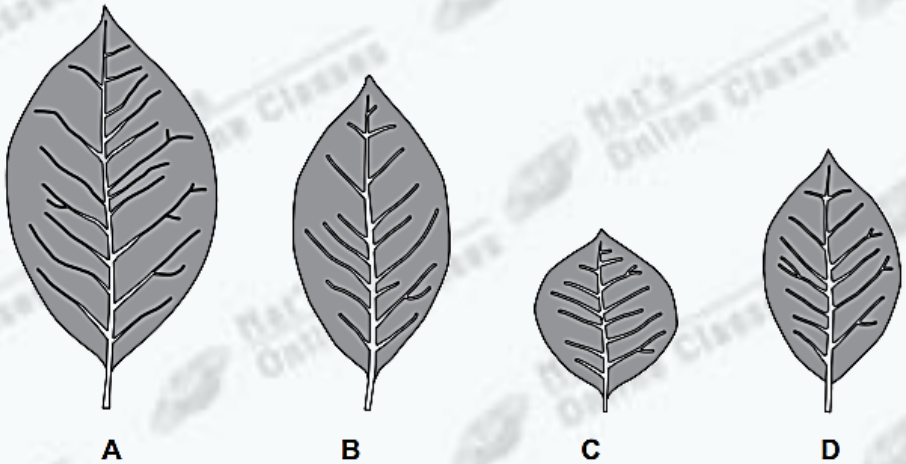
2 (d) The student investigated the rate of water loss from leaves.

The student:

- took four leaves, **A**, **B**, **C** and **D**, from the same plant
- measured the mass of each leaf
- kept the leaves in the same room for 3 hours
- measured the mass of each leaf again.

Figure 3 shows the four leaves she used.

Figure 3



2 (d) (i) How could the student calculate the mass of water lost for each leaf?

[1 mark]

Tick (✓) **one** box.

mass after ÷ mass before ☐

mass after × mass before ☐

mass before + mass after ☐

mass before − mass after ☐

2 (d) (ii) Suggest which leaf, **A**, **B**, **C** or **D**, lost the most water.

Give a reason for your answer.

[2 marks]

Leaf _____

Reason _____

_____

2 (d) (iii) The student changed the conditions in the room.

Suggest **two** conditions that would increase the rate of water loss from the leaves.

[2 marks]

1 _____

2 _____