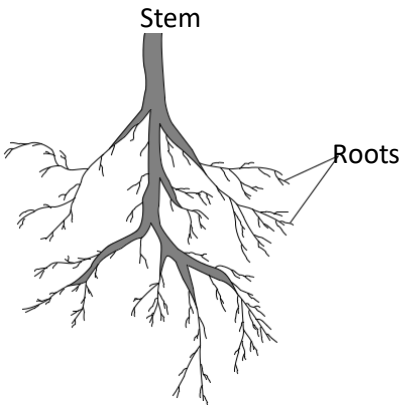
# Diffusion,Osmosis and Active Transport 2

**Q:1** Plants need different substances to survive. Figure 4 shows the roots of a plant.

Figure 4




**(a) (i)** Mineral ions are absorbed through the roots.

Name one other substance absorbed through the roots.

_____

**[1 mark]**

**(a) (ii)** The plant in Figure 4 has a higher concentration of mineral ions in the cells of its roots than the concentration of mineral ions in the soil.

Which two statements correctly describe the absorption of mineral ions into the plant's roots?

Tick (⍰) two boxes.

The mineral ions are absorbed by active transport. ☐

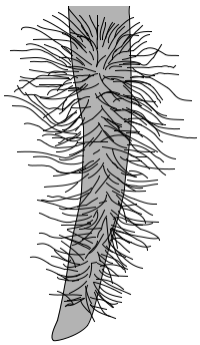
The mineral ions are absorbed by diffusion. ☐

The mineral ions are absorbed down the concentration gradient. ☐

The absorption of mineral ions needs energy. ☐

**(a) (iii)** The plant in Figure 4 has roots adapted for absorption. Figure 5 shows a magnified part of a root from Figure 4.

Figure 5



Describe how the root in Figure 5 is adapted for absorption.

_____

_____

_____

_____

**[2 marks]**

**Q:2** In fish and chip shops, potatoes are cut into chips several hours before they are cooked. The amount of water in the chips must be kept constant during this time.

To keep the water in the chips constant, the chips are kept in salt solution.

A student investigated the effect of different concentrations of salt solution on the mass of chips.

He weighed each of five chips.

He placed each chip into a different concentration of salt solution. After one hour he removed the chips, then reweighed them.

His results are shown in the table.

| Concentration of salt solution | 0 M | 0.5 M | 1 M | 2 M | 3 M |
|---|---|---|---|---|---|
| Mass of chip at start in grams | 2.6 | 2.8 | 2.8 | 2.5 | 2.6 |
| Mass of chip after one hour in grams | 2.7 | 2.8 | 2.7 | 2.3 | 2.1 |

**(a)(i)** In which concentration of salt solution did the chip gain mass?

_____M

**(1 mark)**

**(a)(ii)** Complete the sentence by drawing a ring around the correct answer in the box.

The chip gained mass because water entered by

| digestion |
|---|
| osmosis. |
| respiration |

**(1 mark)**

**(b)** In which concentration of salt solution should the chips be kept?

_____ M

Give a reason for your answer.

_____

_____

**(2 marks)**

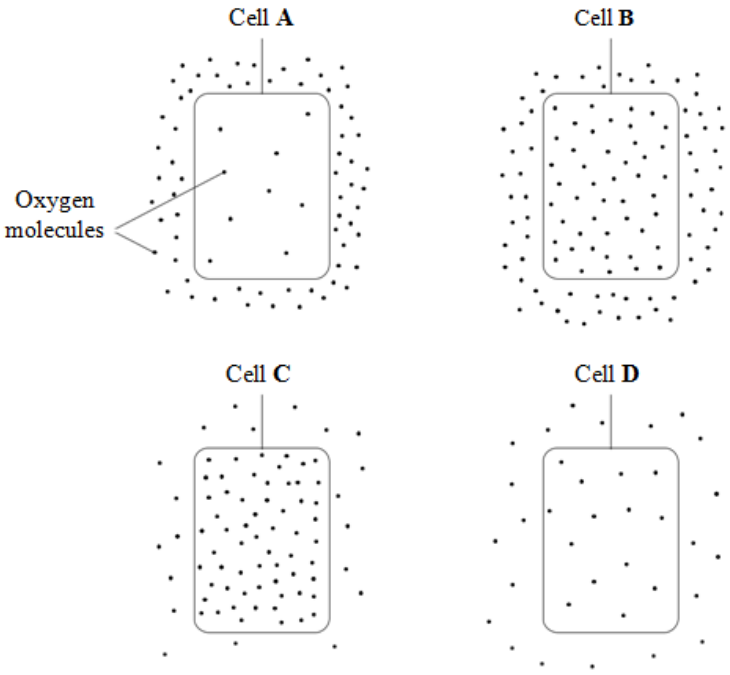
**(c)** How could the student have made his investigation more reliable?

_____

_____

**(1 mark)**

**Q:3** **(a)** The diagrams show cells containing and surrounded by oxygen molecules. Oxygen can move into cells or out of cells.




Into which cell, A, B, C or D, will oxygen move the fastest?

Write your answer, A, B, C or D, in the box.

☐

**(1 mark)**

**(b)** Draw a ring around the correct word to complete each sentence.

**(b)** **(i)** Oxygen is taken into cells by the process of

| |
|---|
| diffusion |
| osmosis. |
| respiration |

**(1 mark)**

**(b)(ii)** Cells need oxygen for

| |
|---|
| photosynthesis . |
| respiration |
| breathing |

**(1 mark)**

**(b) (iii)** The parts of cells that use up the most oxygen are the

| |
|---|
| membranes |
| mitochondria . |
| nuclei |

**(1 mark)**

**(b)(iv)** Some cells produce oxygen in the process of

| |
|---|
| diffusion |
| photosynthesis . |
| respiration |

**(1 mark)**

**Q:4** Cells contain a solution of salts and sugars.

A student is investigating how cells change when they are put into water.

**(a)** The student:

- looks at a plant cell using a microscope
- adds water to the cell.

The plant cell swells up.

Explain why, as fully as you can.

_____

_____

**(3 marks)**

**(b)** When animal cells are put in water, they swell up, and then burst.

When plant cells are put in water, they swell up, but do not burst.

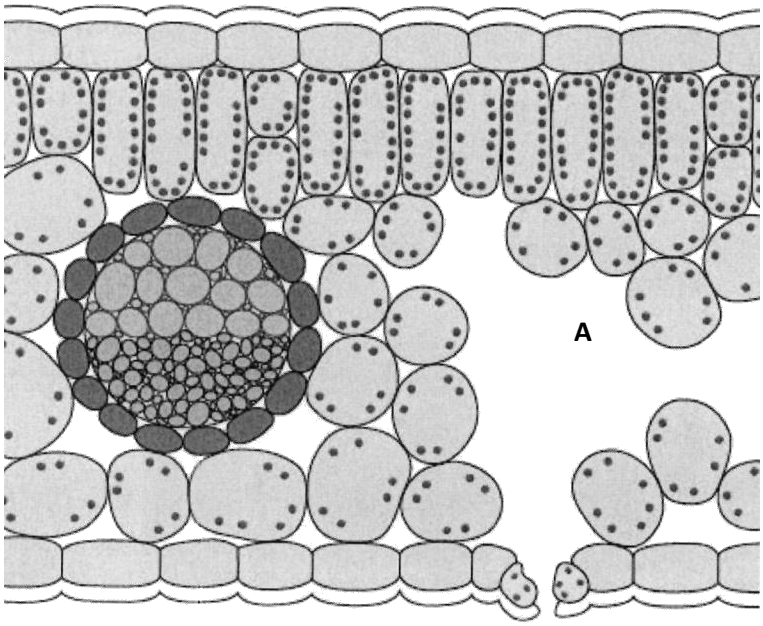
How does the structure of plant cells prevent them from bursting?

_____

_____

**(1 mark)**

**Q:5** The diagram shows a section through a plant leaf.



**(a)** Use words from the box to name two tissues in the leaf that transport substances around the plant.

| epidermis | mesophyll | phloem | xylem |
|---|---|---|---|

_____ and _____ **(1 mark)**

**(b)** Gases diffuse between the leaf and the surrounding air.

**(b) (i)** What is diffusion?

_____

_____

_____

_____

**(2 marks)**

**(b) (ii)** Name one gas that will diffuse from point A to point B on the diagram on a sunny day.

_____

**(1 mark)**

**Q:6** In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Diffusion is an important process in animals and plants.

The movement of many substances into and out of cells occurs by diffusion. Describe why diffusion is important to animals and plants.

In your answer you should refer to:

- animals
- plants
- examples of the diffusion of named substances.

Extra space

**[6 marks]**

**TOTAL MARKS=29**