

Q1. Substances can move into and out of cells.

(a) (i) How does oxygen move into and out of cells?

Draw a ring around **one** answer.

diffusion

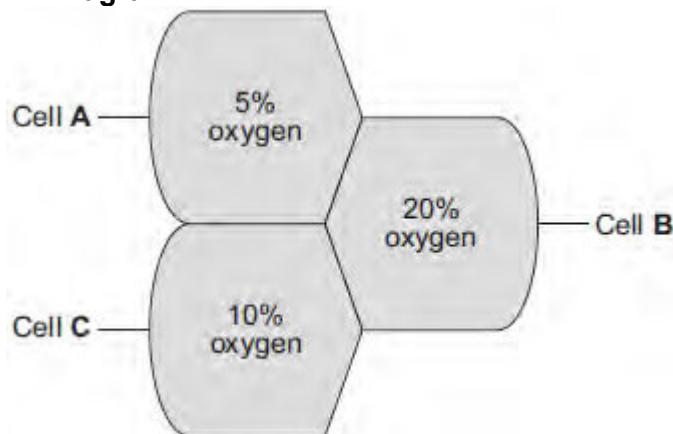
digestion

photosynthesis

(1)

(ii) **Diagram 1** shows the percentage concentration of oxygen in three cells, **A**, **B** and **C**.

Diagram 1



Oxygen can move from cell to cell.

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

(1)

(b) (i) How does water move into and out of cells?

Draw a ring around **one** answer.

breathing

osmosis

respiration

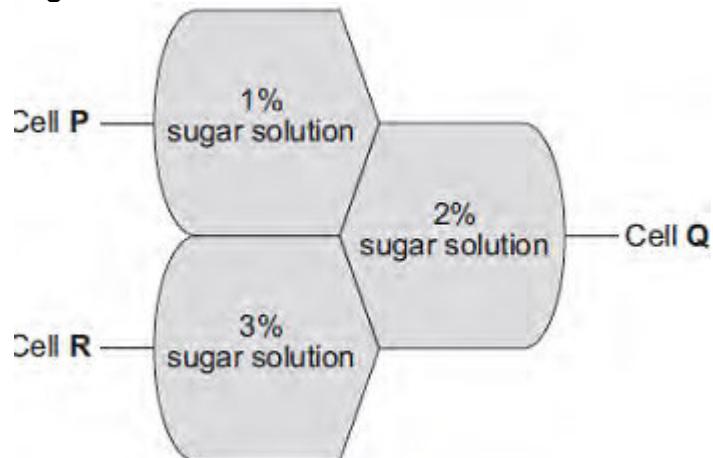
(1)

(ii) Differences in the concentration of sugars in cells cause water to move into or out of cells at different rates.

Diagram 2 shows three different cells, **P**, **Q** and **R**.

The information shows the percentage concentration of sugar solution in cells **P**, **Q** and **R**.

Diagram 2

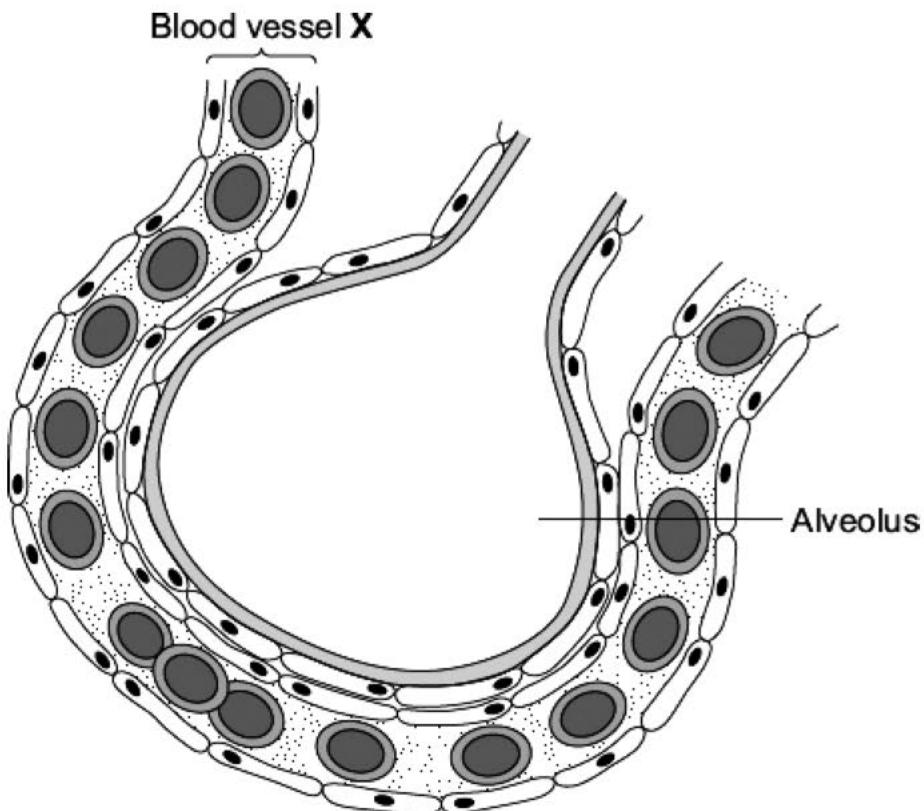


Water can move from cell to cell.

Into which cell, **P**, **Q** or **R**, will water move the fastest?

(1)
(Total 4 marks)

Q2. The diagram shows an alveolus and a blood vessel in the lung.



(a) Draw a ring around the correct answer to complete each sentence.

(i) Blood vessel X is

an artery.

a capillary.

a vein.

(1)

(ii) Gases pass across the wall of the alveolus by

diffusion.

evaporation.

fermentation.

(1)

(iii) The table compares the concentrations of some gases in inhaled air and exhaled air.

Complete the table.

Write 'lower' **or** 'higher' in each box.

One line has been completed for you as an example.

Gas	Concentration	
	Inhaled air	Exhaled air
Water vapour	lower	higher
Carbon dioxide		
Oxygen		

(2)

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

(i) Oxygen is carried in the blood mainly in

blood plasma.

red blood cells.

white blood cells.

(1)

(ii) In the blood, the oxygen combines with

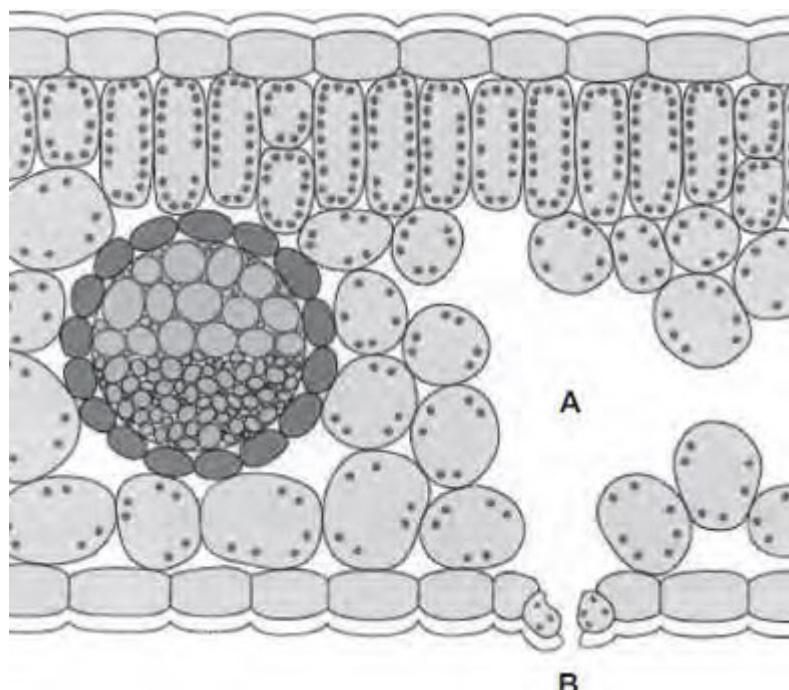
carbon dioxide.

haemoglobin.

urea.

(1)
(Total 6 marks)

Q3. 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
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..... and

(1)

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

(i) What is *diffusion*?

.....
.....
.....
.....

(2)

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

.....
(1)
(Total 4 marks)

Q4. After a meal rich in carbohydrates, the concentration of glucose in the small intestine changes.

The table below shows the concentration of glucose at different distances along the small intestine.

Distance along the small intestine in cm	Concentration of glucose in mol dm ⁻³
100	50
300	500
500	250
700	0

(a) At what distance along the small intestine is the glucose concentration highest?

..... cm
(1)

(b) Use the data in the table to plot a bar chart on the graph below.

- Label the y-axis.
- Choose a suitable scale.



(4)

(c) Look at the graph above.

Describe how the concentration of glucose changes as distance increases along the small intestine.

.....

.....

.....

.....

(2)

(d) Explain why the concentration of glucose in the small intestine changes between 100 cm and 300 cm.

.....

.....

.....

.....

.....

.....

(2)

(e) Explain why the concentration of glucose in the small intestine changes between 300 cm and 700 cm.

.....

.....

.....

.....

.....

.....

.....

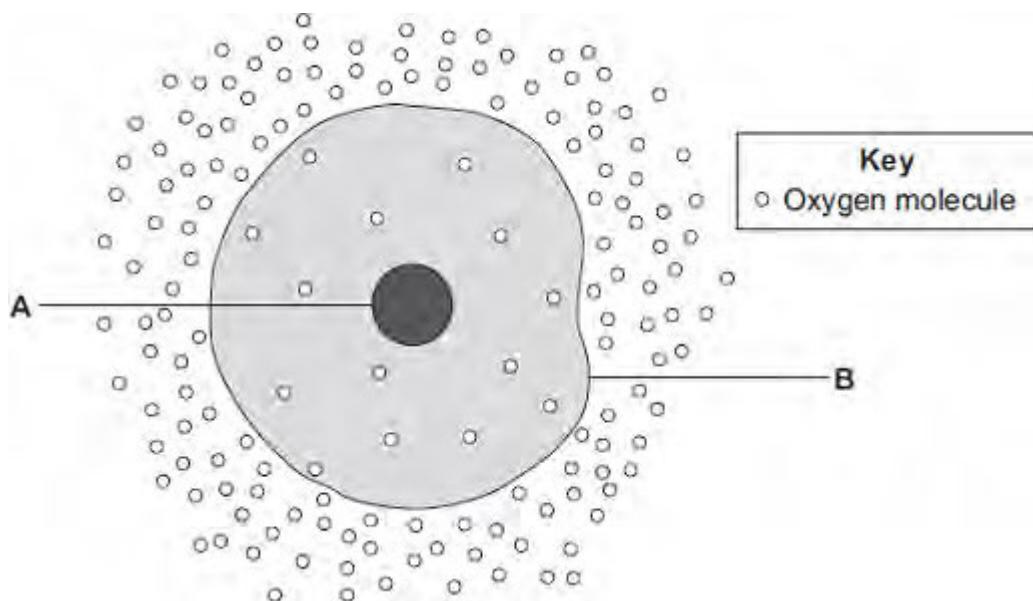
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.....

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(3)
(Total 12 marks)

Q5. The diagram shows a cell.



(a) (i) Use words from the box to name the structures labelled **A** and **B**.

cell membrane	chloroplast	cytoplasm	nucleus
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A

B

(2)

(ii) The cell in the diagram is an animal cell.

How can you tell it is an animal cell and **not** a plant cell?

Give **two** reasons.

1

.....

2

.....

(2)

(b) Oxygen will diffuse into the cell in the diagram.

Why?

Use information from the diagram.

.....

.....

(1)

(c) The cell shown in the diagram is usually found with similar cells.

Draw a ring around the correct answer to complete the sentence.

Scientists call a group of similar cells

an organ.
a system.
a tissue.

(1)
(Total 6 marks)

Q6. Substances can move into cells and out of cells.

(a) Draw a ring around the correct answer to complete each sentence.

Water moves into cells and out of cells by

active transport.
osmosis.
reabsorption.

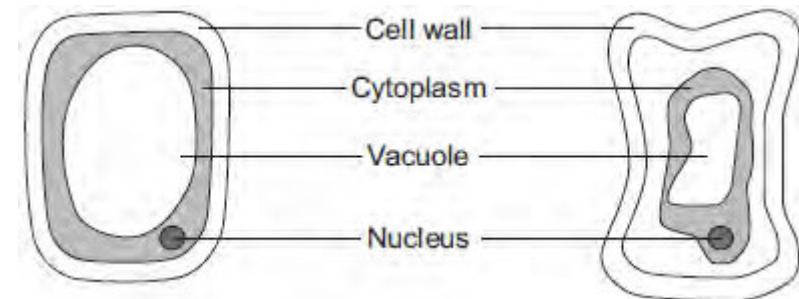
The water moves through a membrane.

freely permeable
non-permeable
partially permeable

(2)

(b) Students put plant cells into two different strengths of sugar solutions, **A** and **B**.

The diagram below shows what the cells looked like after 1 hour.



Cell in
sugar solution **A**
(after 1 hour)

Cell in
sugar solution **B**
(after 1 hour)

(i) Describe **two** ways in which the cell in sugar solution **B** is different from the cell in sugar solution **A**.

1

.....

2

(2)

(ii) A student put red blood cells into water.

Suggest what would happen to the cells.

.....
.....
.....

(1)

(c) In the human body, glucose is absorbed into the blood from the small intestine.

The small intestine contains many villi.

Which **two** of the following help the absorption of glucose in the small intestine?

Tick (✓) **two** boxes.

Villi have a cell wall.

Villi are covered in thick mucus.

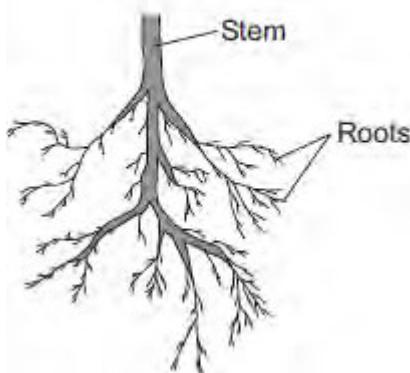
Villi give the small intestine a large surface area.

Villi have many blood capillaries.

(2)
(Total 7 marks)

Q7. Plants need different substances to survive. **Figure 1** shows the roots of a plant.

Figure 1



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

Name **one** other substance absorbed through the roots.

.....

(1)

(ii) The plant in **Figure 1** 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.

(2)

(iii) The plant in **Figure 1** has roots adapted for absorption.

Figure 2 shows a magnified part of a root from **Figure 1**.

Figure 2



Describe how the root in **Figure 2** is adapted for absorption.

.....
.....
.....
.....

(2)

(b) The leaves of plants have stomata.

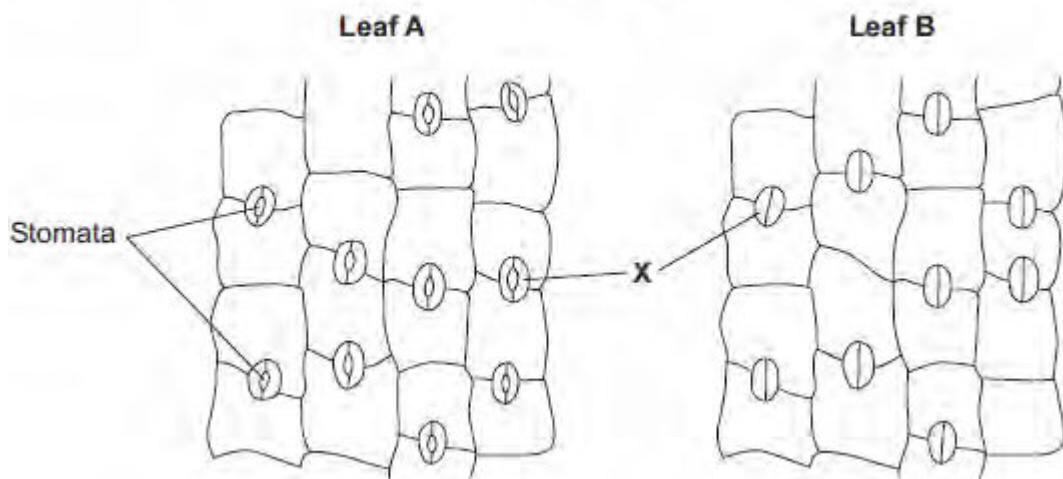
What is the function of the stomata?

.....
.....

(1)

(c) **Figure 3** shows the underside of two leaves, **A** and **B**, taken from a plant in a man's house.

Figure 3



(i) In **Figure 3**, the cells labelled **X** control the size of the stomata.

What is the name of the cells labelled **X**?

Tick (✓) one box.

Guard cells

Phloem cells

Xylem cells

(1)

(ii) Describe how the appearance of the stomata in leaf **B** is different from the appearance of the stomata in leaf **A**.

.....

.....

(1)

(iii) The man forgets to water the plant.

What might happen to the plant in the next few days if the stomata stay the same as shown in leaf **A** in **Figure 3**?

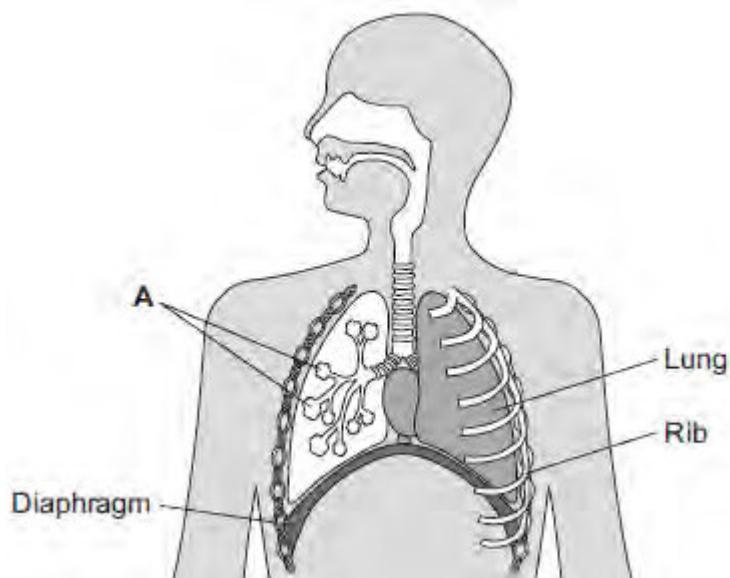
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(1)
(Total 9 marks)

Q8. Our lungs help us to breathe.

The image below shows the human breathing system.



(a) (i) Name part A.

.....

(1)

(ii) Give **one** function of the ribs.

.....

(1)

(b) (i) Use the correct answer from the box to complete the sentence.

active transport	diffusion	osmosis
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Oxygen moves from the air inside the lungs into the blood by the process of

(1)

(ii) Use the correct answer from the box to complete the sentence.

arteries	capillaries	veins
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Oxygen moves from the lungs into the blood through the walls

of the

(1)

(iii) Inside the lungs, oxygen is absorbed from the air into the blood.

Give **two** adaptations of the lungs that help the rapid absorption of oxygen into the blood.

1

.....

2

.....

(2)
(Total 6 marks)