**Q1.**Living organisms are made of cells.

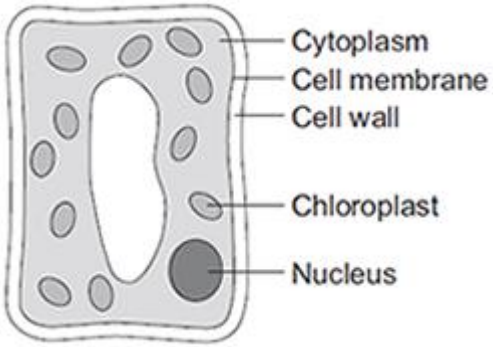
(a) Animal and plant cells have several parts. Each part has a different function.

Draw **one** line from each cell part to the correct function of that part.

| Cell part | Function |
| --- | --- |
| Cell membrane | Where most energy is released in respiration |
| Mitochondria | Controls the movement of substances into and out of the cell |
| Nucleus | Controls the activities of the cell |
| | Where proteins are made |

**(3)**

(b) The diagram below shows a cell from a plant leaf.




Which **two** parts in the diagram above are **not** found in an animal cell?

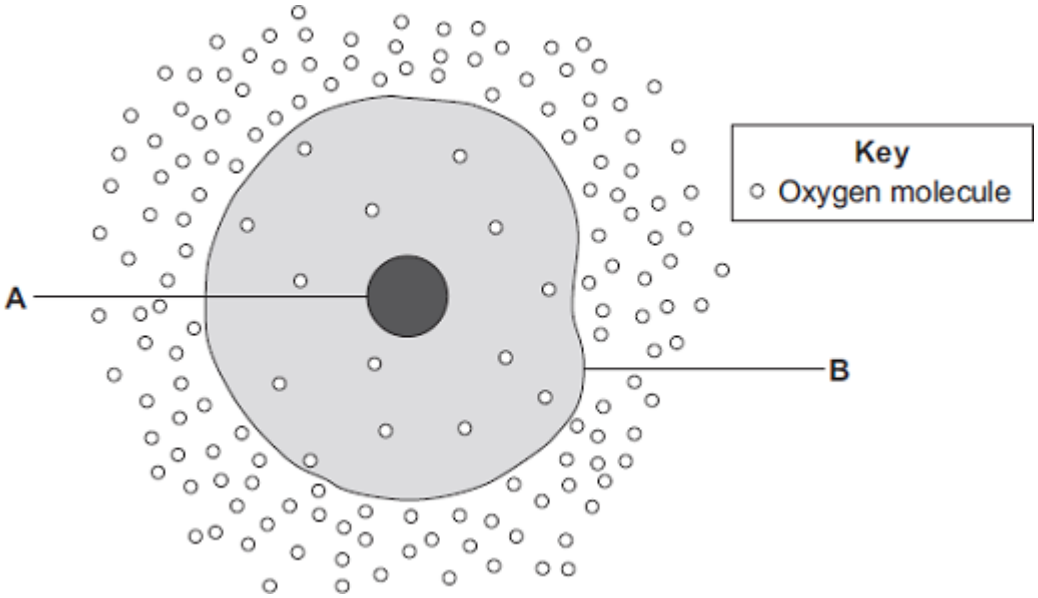
1 .....

2 .....

**(2)**

**(Total 5 marks)**

**Q2.**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 |

**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.

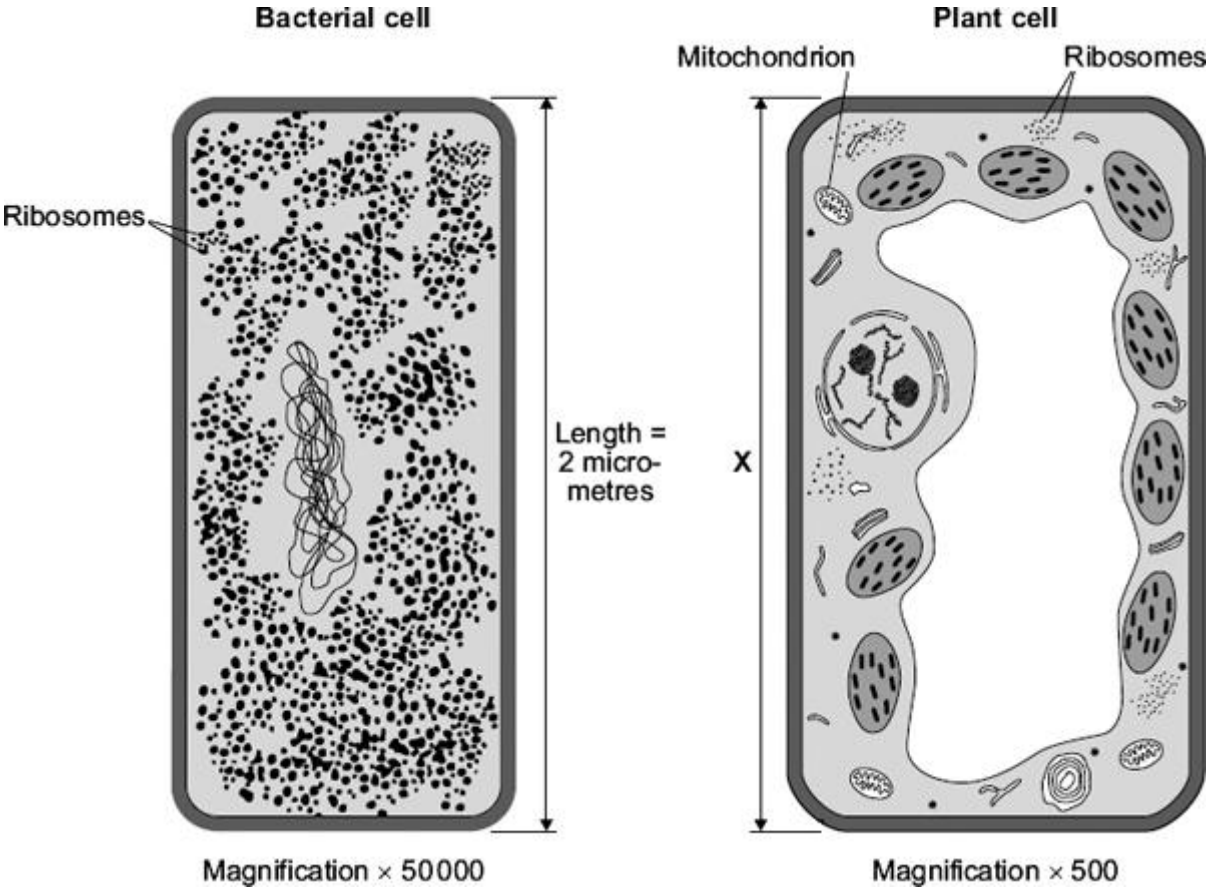
a system.

a tissue.

**(1)**

**(Total 6 marks)**

**Q3.** The diagram shows two cells, a bacterial cell and a plant cell.




(a) (i) Both the bacterial cell and the plant cell contain ribosomes.

What is the function of a ribosome?

.....

.....

**(1)**

(ii) The plant cell contains mitochondria but the bacterial cell does **not** contain mitochondria.

Give **one** other way in which the plant cell is different from the bacterial cell.

.....

.....

**(1)**

(b) (i) Both cells are drawn the same length, but the magnification of each cell is different.

The real length of the bacterial cell is 2 micrometres.
Calculate the real length, **X**, of the plant cell. Give your answer in micrometres.

Show clearly how you work out your answer.

.....

.....

.....

**X** = ..... micrometres

**(2)**

(ii) Most mitochondria are about 3 micrometres in length.

The plant cell contains mitochondria but the bacterial cell does **not** contain mitochondria.

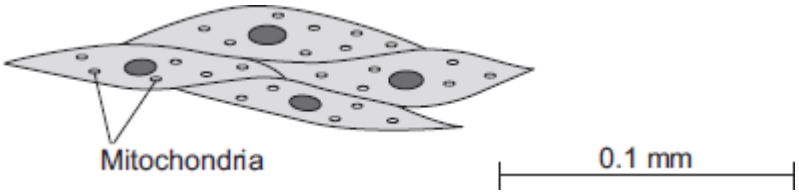
Use your answer to part (b)(i) and the information in the diagram to suggest why.

.....

.....

**(1)**
**(Total 5 marks)**

**Q4.** The image below shows some muscle cells from the wall of the stomach, as seen through a light microscope.




(a) Describe the function of muscle cells in the wall of the stomach.

.....

.....

.....

.....

**(2)**

(b) **Figure above** is highly magnified.

The scale bar in **Figure above** represents 0.1 mm.

Use a ruler to measure the length of the scale bar and then calculate the magnification of **Figure above**.

.....

.....

.....

.....

Magnification = ..... times

**(2)**

(c) The muscle cells in **Figure above** contain many mitochondria.

What is the function of mitochondria?

.....

.....

.....

.....

**(2)**

(d) The muscle cells also contain many ribosomes. The ribosomes cannot be seen in **Figure above**.

(i) What is the function of a ribosome?

.....

.....

**(1)**

(ii) Suggest why the ribosomes **cannot** be seen through a light microscope.

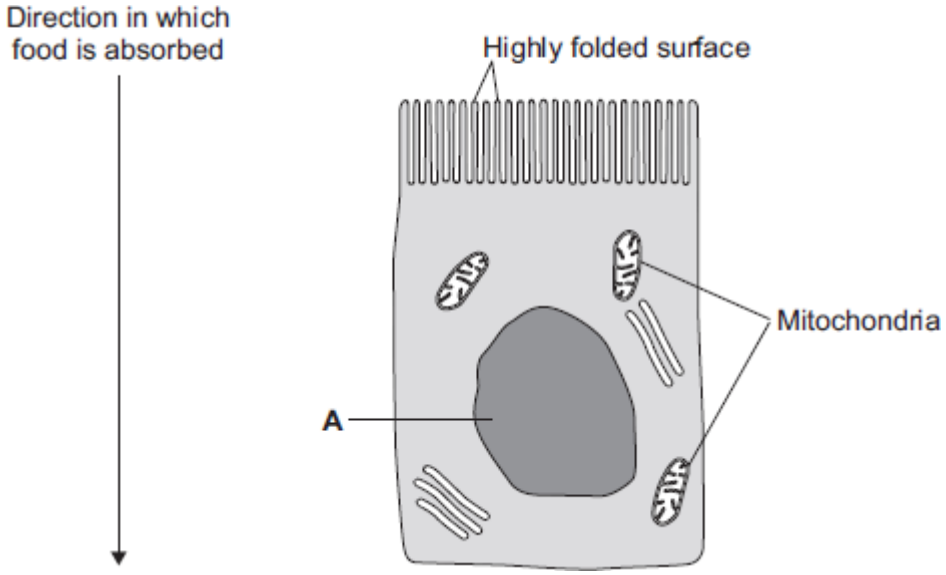
.....

.....

**(1)**

**(Total 8 marks)**

**Q5.**The image below shows an epithelial cell from the lining of the small intestine.




(a) (i) In the image above, the part of the cell labelled **A** contains chromosomes.

What is the name of part **A**?

.....

**(1)**

(ii) How are most soluble food molecules absorbed into the epithelial cells of the small intestine?

Draw a ring around the correct answer.

**diffusion** **osmosis** **respiration**

**(1)**

(b) Suggest how the highly folded cell surface helps the epithelial cell to absorb soluble food.

.....

.....

**(1)**

(c) Epithelial cells also carry out active transport.

(i) Name **one** food molecule absorbed into epithelial cells by active transport.

.....

**(1)**

(ii) Why is it necessary to absorb some food molecules by active transport?

.....

.....

**(1)**

(ii) Suggest why epithelial cells have many mitochondria.

.....

.....

.....

.....

**(2)**

(d) Some plants also carry out active transport.

Give **one** substance that plants absorb by active transport.

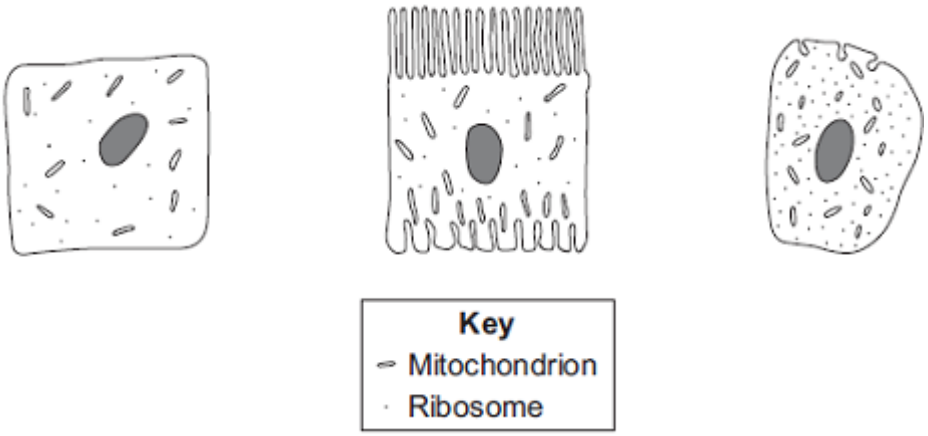
.....

**(1)**

**(Total 8 marks)**

**Q6.** Diagrams **A**, **B** and **C** show cells from different parts of the human body, all drawn to the same scale.

**A B C**




(a) Which cell, **A**, **B** or **C**, appears to be best adapted to increase diffusion into or out of the cell? ☐

Give **one** reason for your choice.

.....

.....

**(1)**

(b) (i) Cell **C** is found in the salivary glands.

Name the enzyme produced by the salivary glands.

.....

**(1)**

(ii) Use information from the diagram to explain how cell **C** is adapted for producing this enzyme.

.....

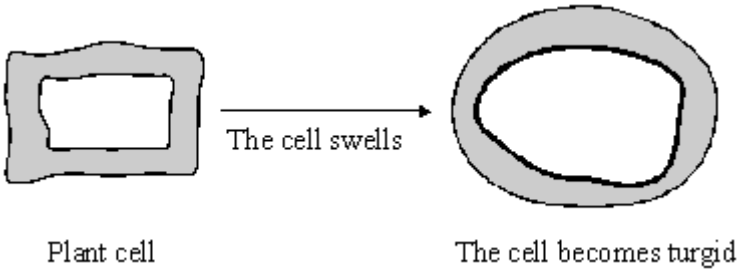
.....

.....

.....

**(2)**
**(Total 4 marks)**

**Q7.** (a) The diagrams show what happens to the shape of a plant cell placed in distilled water.




(i) Explain why the cell swells and becomes turgid. Name the process involved.

.....

.....

.....

**(2)**

(ii) Give **one** feature of the cell wall which allows the cell to become turgid.

.....

**(1)**

(b) Describe the change which will occur if a piece of peeled potato is placed in a concentrated sugar solution and explain why this change occurs.

.....

.....

.....

.....

.....

.....

**(3) (Total 6 marks)**

**Q8.** The table shows the concentrations of three mineral ions in the roots of a plant and in the water in the surrounding soil.

| Mineral ion | Concentration in millimoles per kilogram | |
|---|---|---|
| | **Plant root** | **Soil** |
| Calcium | 120 | 2.0 |
| Magnesium | 80 | 3.1 |
| Potassium | 250 | 1.2 |

(a) (i) The plant roots could **not** have absorbed these mineral ions by diffusion.

Explain why.

.....

.....

.....

.....

**(2)**

(ii) Name the process by which the plant roots absorb mineral ions.

.....

**(1)**

(b) How do the following features of plant roots help the plant to absorb mineral ions from the soil?

(i) A plant root has thousands of root hairs.

.....

.....

**(1)**

(ii) A root hair cell contains many mitochondria.

.....

.....

**(2)**

(iii) Many of the cells in the root store starch.

.....

.....

(1) **(Total 7 marks)**