

Transport in Cells

Question Paper 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.1 Cell Biology
Sub-Topic	Transport in Cells
Difficulty Level	Silver Level
Booklet	Question Paper 1

Time Allowed: 45 minutes

Score: /44

Percentage: /100

Grade Boundaries:

Q1. Students used quadrats to estimate the population of dandelion plants on a field.

- (a) Describe how quadrats should be used to estimate the number of dandelion plants in a field.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

- (b) The field measured 40 m by 145 m.

The students used 0.25 m² quadrats.

The students found a mean of 0.42 dandelions per quadrat.

Estimate the population of dandelions on the field.

.....

.....

.....

.....

Estimated population of dandelions =

(2)

- (c) In one area of the field there is a lot of grass growing in the same area as dandelions.

Suggest why the dandelions may **not** grow well in this area.

.....

.....

.....

.....

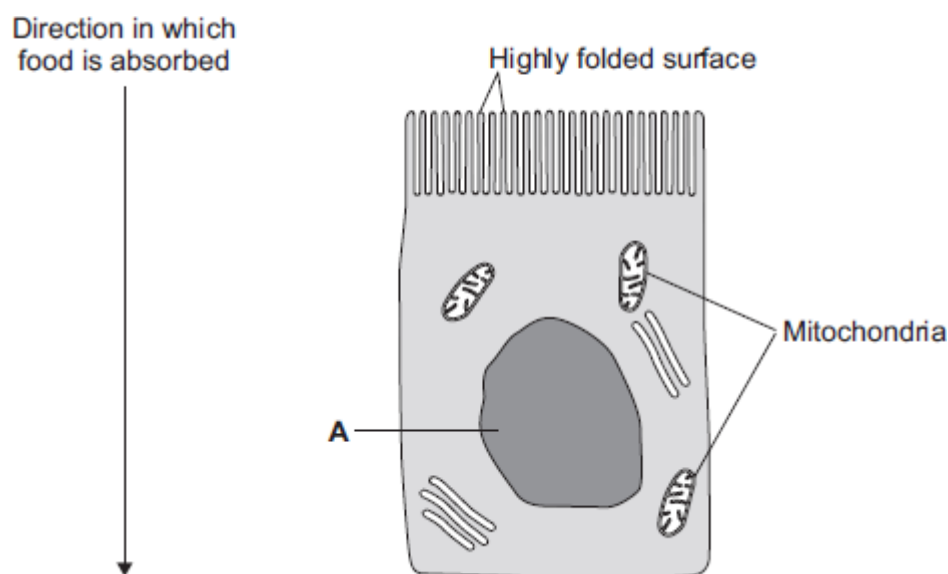
.....

.....

.....

(4)
(Total 10 marks)

Q2. 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.

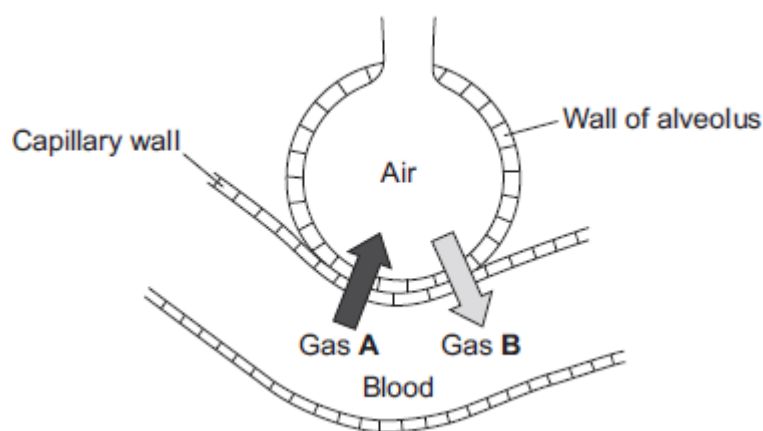
Give **one** substance that plants absorb by active transport.

(1)
(Total 8 marks)

Q3. Gas exchange takes place in the lungs.

The diagram shows an alveolus next to a blood capillary in a lung.

The arrows show the movement of two gases, **A** and **B**.



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

Gases **A** and **B** move by

diffusion.
osmosis.
respiration.

(1)

(ii) Gas **A** moves from the blood to the air in the lungs.

Gas **A** is then breathed out.

Name Gas **A**.

(1)

- (iii) Which cells in the blood carry Gas **B**?

Draw a ring around the correct answer.

platelets

red blood cells

white blood cells

(1)

- (b) The average number of alveoli in each human lung is 280 million.

The average surface area of 1 million alveoli is 0.25 m².

Calculate the total surface area of a human lung.

.....

Answer m²

(2)

- (c) An athlete trains to run a marathon. The surface area of each of the athlete's lungs has increased to 80 m².

Give **one** way in which this increase will help the athlete.

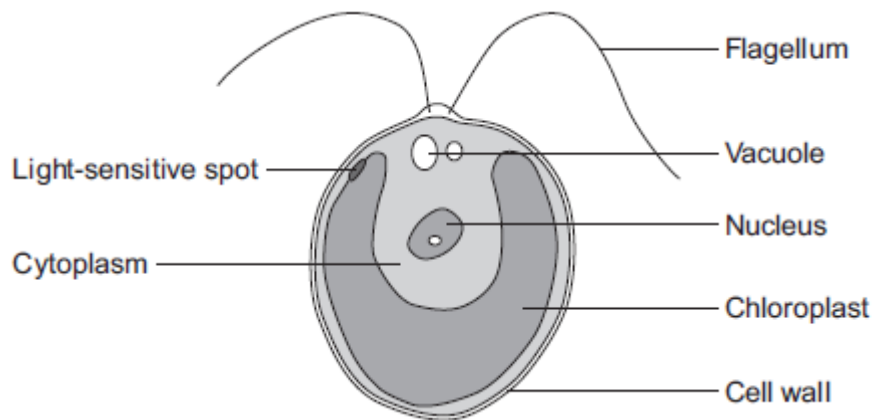
.....

.....

(1)

(Total 6 marks)

Q4. The diagram below shows a single-celled alga which lives in fresh water.



(a) Which part of the cell labelled above:

(i) traps light for photosynthesis

.....

(1)

(ii) is made of cellulose?

.....

(1)

(b) In the freshwater environment water enters the algal cell.

(i) What is the name of the process by which water moves into cells?

.....

(1)

(ii) Give the reason why the algal cell does not burst.

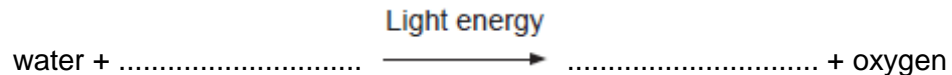
.....

.....

(1)

- (c) (i) The alga can photosynthesise.

Complete the **word** equation for photosynthesis.



(2)

- (ii) The flagellum helps the cell to move through water. Scientists think that the flagellum and the light-sensitive spot work together to increase photosynthesis.

Suggest how this might happen.

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

(2)

- (d) Multicellular organisms often have complex structures, such as lungs, for gas exchange.

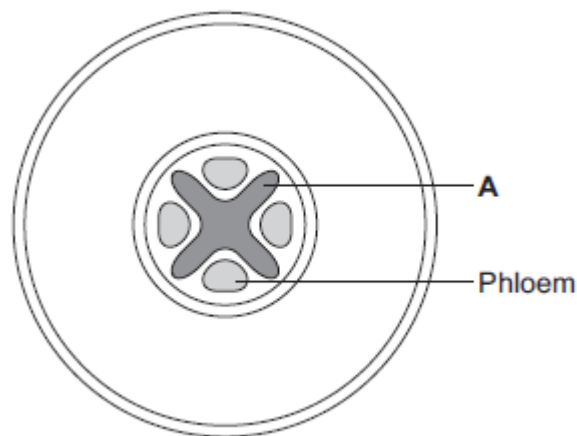
Explain why single-celled organisms, like algae, do **not** need complex structures for gas exchange.

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

(3)

(Total 11 marks)

Q5. The diagram below shows a cross-section of a plant root. The transport tissues are labelled.



- (a) (i) What is tissue **A**?

Draw a ring around the correct answer.

cuticle

epidermis

xylem

(1)

- (ii) Name **two** substances transported by tissue **A**.

1

2

(2)

- (b) Phloem is involved in a process called translocation.

- (i) What is translocation?

.....

.....

.....

(1)

- (ii) Explain why translocation is important to plants.

.....

.....

.....

.....

(2)

- (c) Plants must use active transport to move some substances from the soil into root hair cells.

- (i) Active transport needs energy.

Which part of the cell releases most of this energy?

Tick (✓) **one** box.

mitochondria

☐

nucleus

☐

ribosome

☐

(1)

- (ii) Explain why active transport is necessary in root hair cells.

.....

.....

.....

.....

.....

.....

(2)

(Total 9 marks)