

Cell Structure

Question Paper 1

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

Time Allowed: 48 minutes

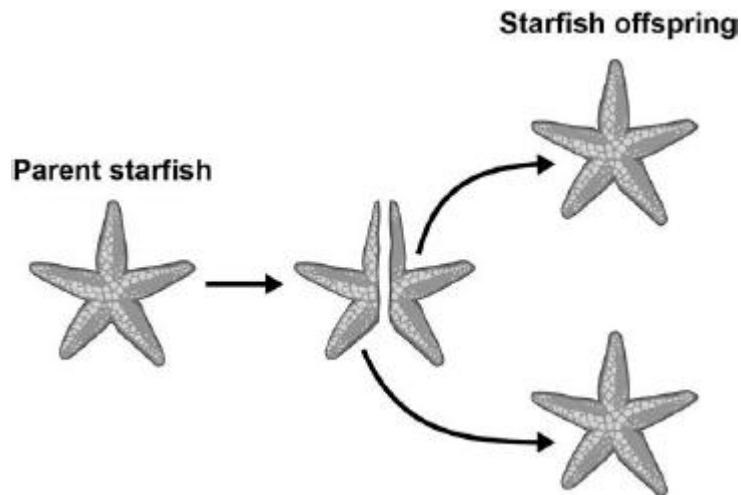
Score: /48

Percentage: /100

Grade Boundaries:

Q1. Starfish can split in half. Each half can then grow new arms to form offspring.

This process is shown in the figure below.



(a) What process produces the starfish offspring?

Tick **one** box.

Asexual reproduction

☐

Fertilisation

☐

Selective breeding

☐

Sexual reproduction

☐

(1)

(b) More cells are produced as the starfish grows more arms.

What process will produce more cells in the starfish as they grow?

.....

(1)

- (c) All the offspring produced are genetically identical.

What name is given to genetically identical organisms?

.....

(1)

- (d) Each body cell of the parent starfish contains 44 chromosomes.

How many chromosomes are in each body cell of the offspring?

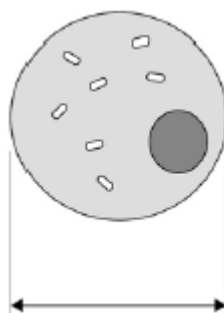
.....

(1)

(Total 4 marks)

Q2.Figure 1 shows a cell viewed through a light microscope.

Figure 1



The size of the real cell is 0.03 mm.

- (a) Calculate the magnification of the microscope.

Use **Figure 1** to help you answer.

.....

.....

Magnification =

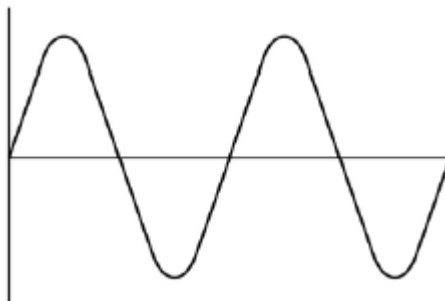
(2)

- (b) A light microscope uses light waves to observe objects.

Light waves can be modelled using water waves.

Figure 2 shows a water wave.

Figure 2



Give **one** similarity between a light wave and a water wave.

.....

(1)

(c) Write down the equation that links frequency, wave speed and wavelength.

.....

(1)

(d) The wave in **Figure 2** has a wavelength of 75 cm.

The wave moves at a speed of 1.6 m / s.

Calculate the frequency of the wave.

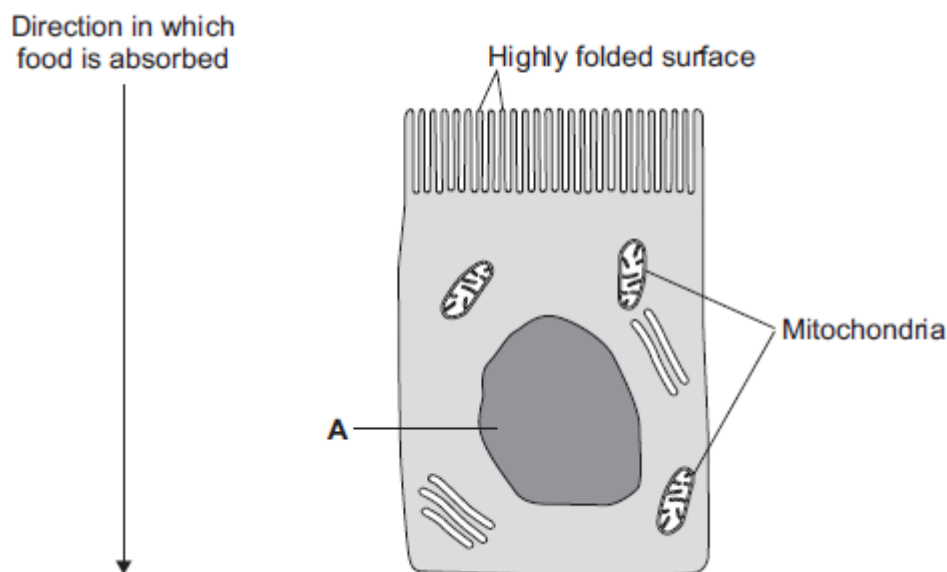
.....
.....
.....
.....
.....

Frequency = Hz

(4)

(Total 8 marks)

Q3.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.

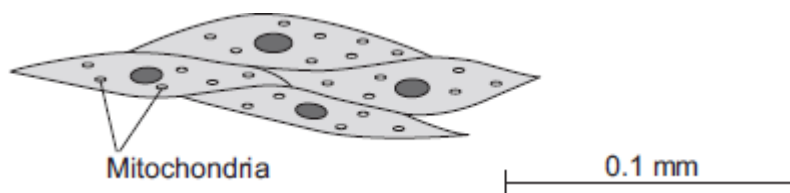
Give **one** substance that plants absorb by active transport.

.....

(1)

(Total 8 marks)

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?

.....

.....

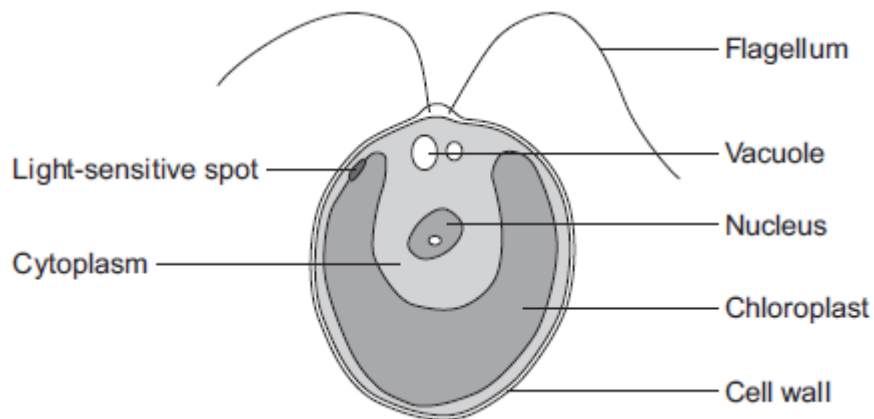
(1)

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

.....
.....

(1)
(Total 8 marks)

Q5. The 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.

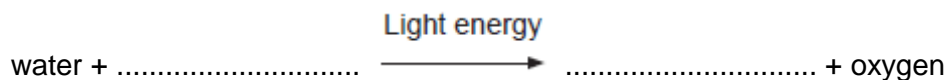
.....

.....

(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.

.....

.....

.....

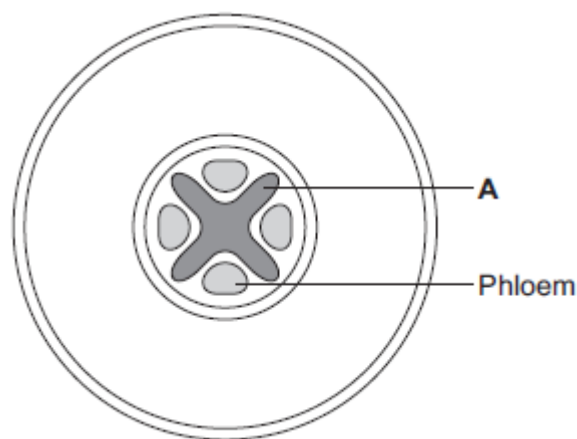
.....

.....

.....

(3)
(Total 11 marks)

Q6. 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)