easyAcademy

Your way to an easy A

2026 WA1 Paper

Naval Base Secondary School

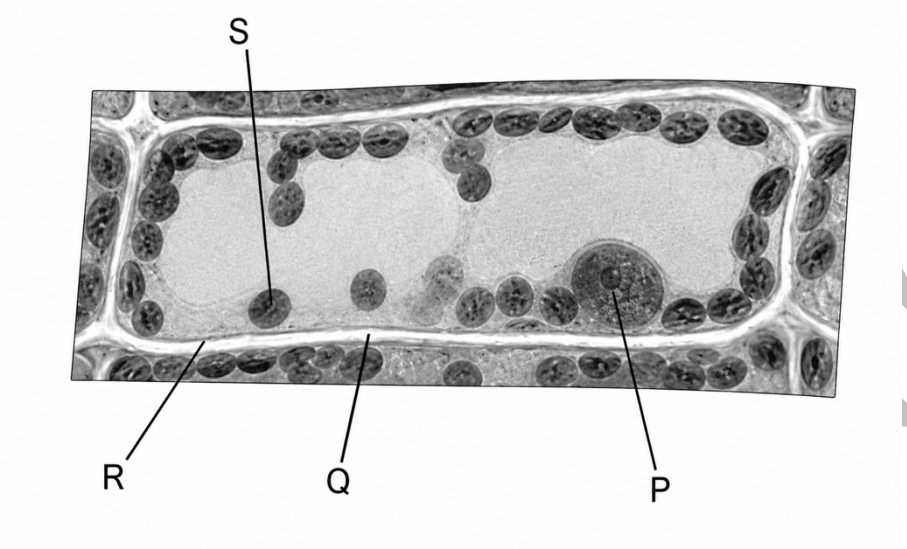
Secondary 3 G3 Science (Biology)

Duration: 35 min

Total	/25

Section A: Choose the one you consider correct and record your choice in the bracket provided. **[5 marks]**

1. The photomicrograph shows a cell from a type of aquatic plant.



Which parts labelled on the photomicrograph indicate that this is a plant cell.

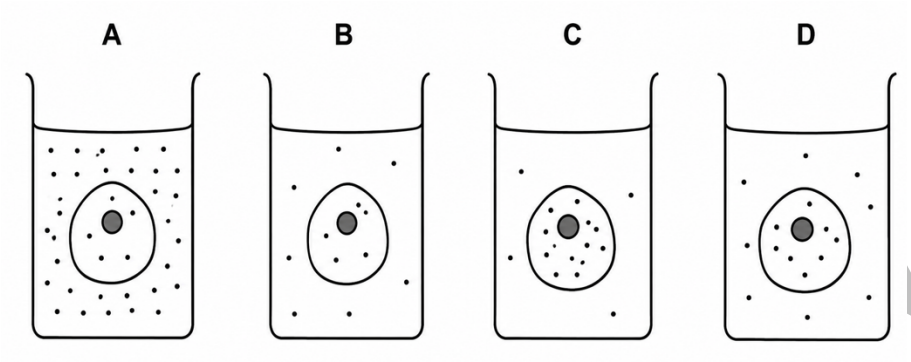
A. P and R
B. P and S
C. Q and R
D. Q and S

( )

2. A farmer watered his plants with a conentrated fertiliser solution in hope that his crops will grow faster. After one day, all his crops wilted.
Which statement explains this?
A. Fertilisers cannot be broken down and will build up in the cells of the plant.
B. Fertiliser decreased the concentration of oxygen in the soil for respiration.
C. The water potential of the soil solution became too low.
D. Too much mineral salts in the fertiliser were absorbed by the plants.

( )

3. The diagrams represent four similar animal cells immersed in blood plasma. The black dots represent molecules of dissolved oxygen. Which cell will have oxygen molecules diffusing into it most rapidly?

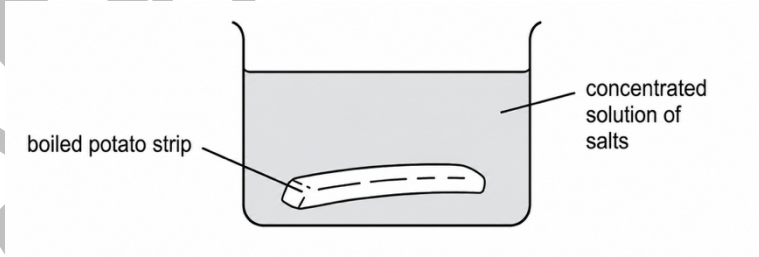


( )

4. Which statement about diffusion is correct?
   A. It only happens through a partially permeable membrane.
   B. It only involves water molecules.
   C. It only occurs between living cells.
   D. It only occurs down a concentration gradient.

( )

5. Boiling potatoes destroys their cell membranes.



A peeled, boiled potato strip is placed in a concentrated solution of salts.
Which row states the process(es) that take place?

	Solute diffusion	Osmosis
(1)	✓	✓
(2)	✓	✗
(3)	✗	✓
(4)	✗	✗

( )

Section B

1. Fig 1.1 is a diagram of an animal cell.

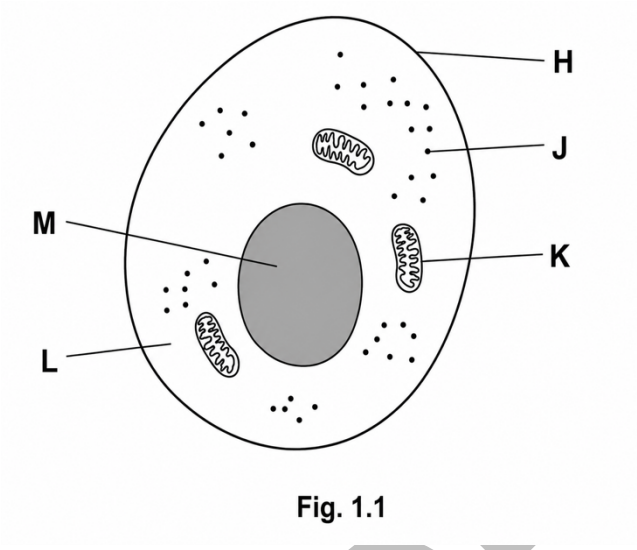


Fig. 1.1

(a) (i) State the letter in Fig 1.1 that identifies: [3]

the cytoplasm _____

the ribosome _____

the structure that controls the activities of the cell _____

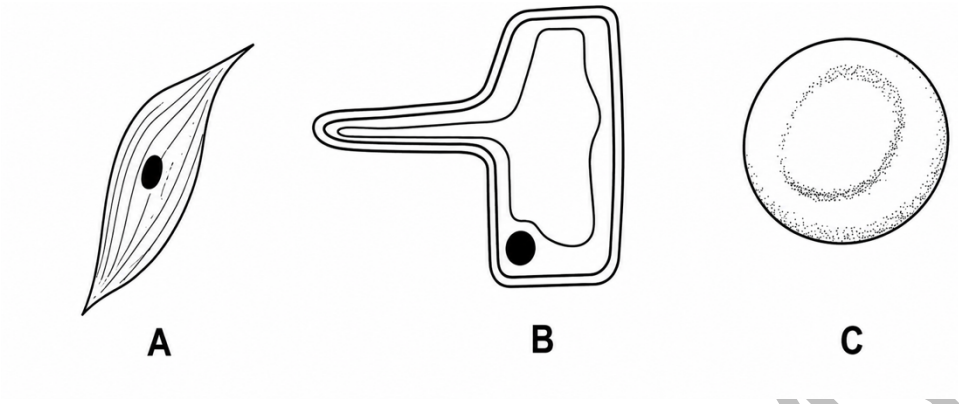
(ii) State the name of structure **K** in Fig 1.1 and state its function. [2]

_____

_____

_____

2. Fig 2.1 shows three specialized cells.



(a) (i) Complete the table, using the letters of the cells, to identify them as animal or plant cells. [2]

	animal	plant
letters		

(ii) State one feature found in all plant cells but not in animal cells. [1]

_____

(b) For each cell shown in Fig 1.1, state one feature that makes the cell different from the other two cells. Relate this feature to the function of the cell. [3]

Cell A

Feature: _____

Function:

_____

_____

_____

Cell B

Feature: _____

Function:

_____

_____

_____

Cell C

Feature: _____

Function:

_____

_____

_____

3. Answer the following questions

(a) Define osmosis. [2]

_____

_____

_____

(b) A group of students investigated the effect of soaking small onion bulbs in different concentrations of sodium chloride solution. The mass of the onions was measured at the start of the experiment. The onions were then immersed in sodium chloride solution and left for three hours. The mass of the onions was measured at the end of the experiment and the change in mass was calculated. The results are shown in Table 3.1.

Concentration of sodium chloride solution / g dm^{-3}	Mass of onion at the start / g	Mass of onion afer three hours / g	Change in mass / g
+260	147	173	+26
25	153	165	+12
50	176	172	-4
100	154	149	-5
150	149	142	

(i) Calculate the change in mass of the onions that were in the most concentrated solution of sodium chloride. Show your working.

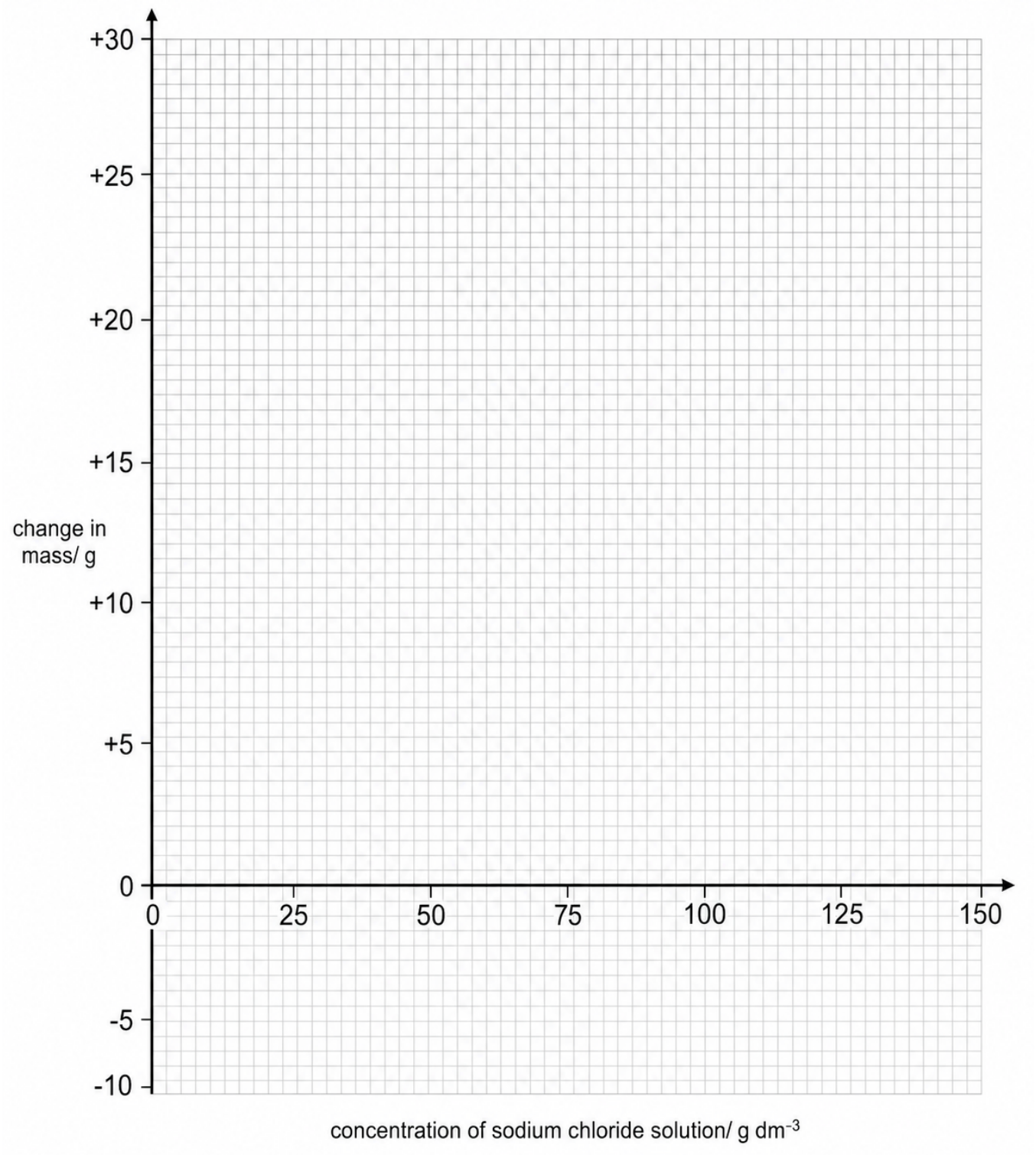
Write your answer in Table 3.1. [1]

(ii) Explain why the students calculated the change in mass of the onions. [1]

_____

_____

(c) Plot the graph of the results as shown in Fig 3.2 in the grid below. [2]



(d) Use the graph to estimate the concentration of the sodium chloride solution that has the same water potential as the onions. [1]

_____

(e) Explain why the onions gained mass when soaked in dilute solutions of sodium chloride. [2]

_____

_____

_____

_____

Solutions

Section A:

D

C

A

D

B

Section B:

1ai. L, J, M

1aii. Mitochondria, it is the site of aerobic respiration to release energy.

2ai. A, C (animal) and B (plant)

2aii. Cell wall

2b. Cell A

Feature: Long spindle-shaped cell with contractile fibres.

Function: Allows the cell to contract and relax to produce movement.

Cell B

Feature: Long root hair projection.

Function: Increases surface area for absorption of water and mineral salts from the soil.

Cell C

Feature: Biconcave disc shape and no nucleus.

Function: Allows efficient transport of oxygen and provides a large surface area for diffusion.

3a. Osmosis is the net movement of water molecules from a region of higher water potential to a region of lower water potential through a partially permeable membrane.

3bi. -7

3bii. Starting mass of each onion is different in different solutions

3d. 42.5 to 45

3e. The onions gained mass because the dilute sodium chloride solution had a higher water potential than the onion cells. Water moved into the onion cells by osmosis through the partially permeable cell membranes, so the onions became heavier.