

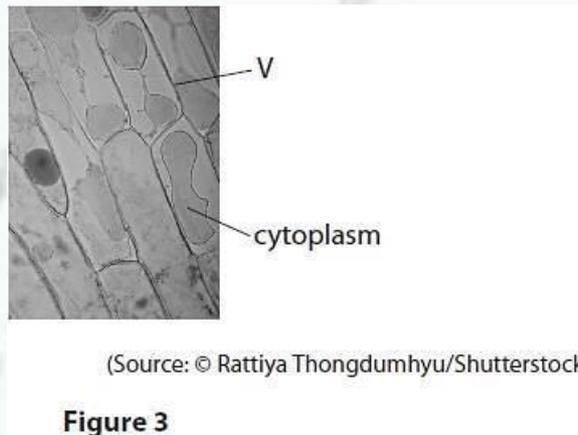
Cell Transport

Total Marks: 16

Q1.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Figure 3 shows some onion cells that have been soaked in a concentrated salt solution.



(i) The cells in Figure 3 have been stained.

Give **one** reason why the cells have been stained.

.....

(1)

(ii) Which is the name of the structure labelled V?

- A chloroplast
- B vacuole
- C nucleus
- D cell wall

(1)

(iii) The salt solution outside the cell has a higher concentration than the solution inside the cell.

Explain why the cytoplasm shrinks away from the sides of the cell when the cells are in salt solution.

(2)

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



Q2.

A student investigated the percentage change in mass of potato cylinders placed in sucrose solutions of different concentrations.

Figure 5 shows the results of the student's investigation.

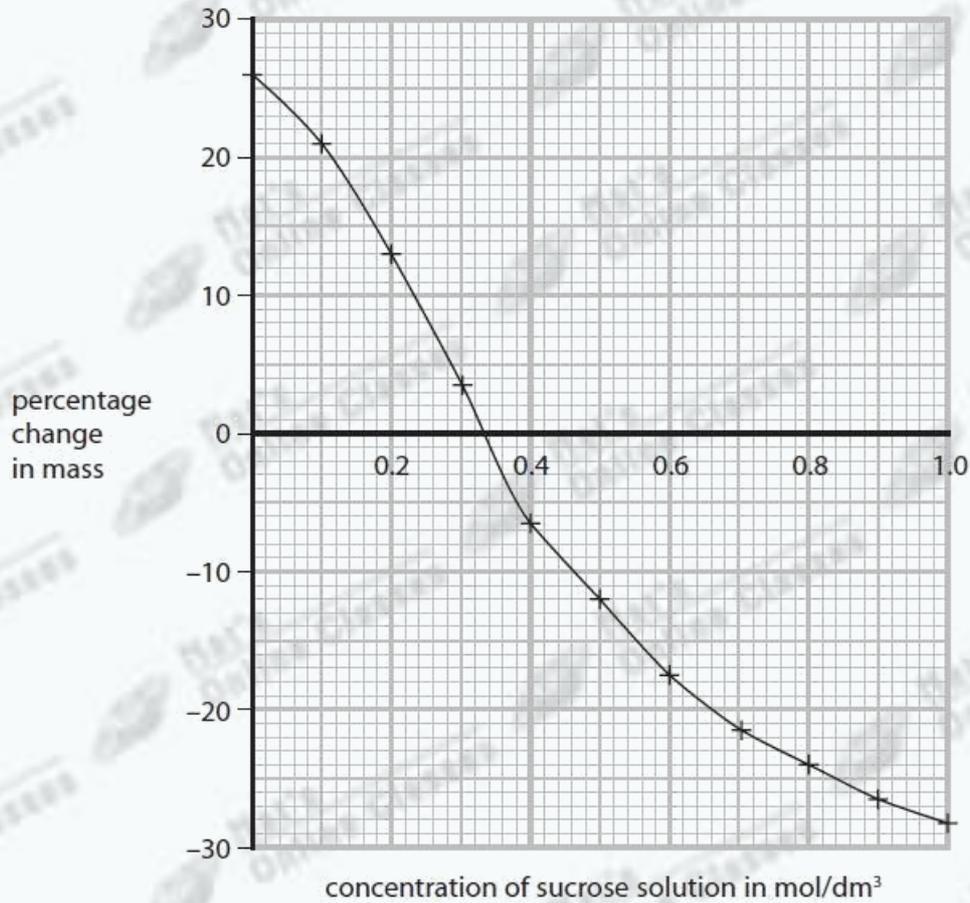


Figure 5

State **two** conclusions that can be made from these results.

(2)

- 1
- 2

Q3.

Alcohol is broken down by liver cells.

Which process moves alcohol from the blood into the liver cells?

(1)

- A** diffusion
- B** respiration
- C** osmosis
- D** transpiration

Q4.

A student placed three different sized cubes of agar jelly into separate beakers containing the same concentration of hydrochloric acid.

The cubes contained a pink indicator.

This indicator becomes clear when in contact with an acid.

Figure 7 shows the results of the investigation after the cubes had been in the acid for 120 seconds.

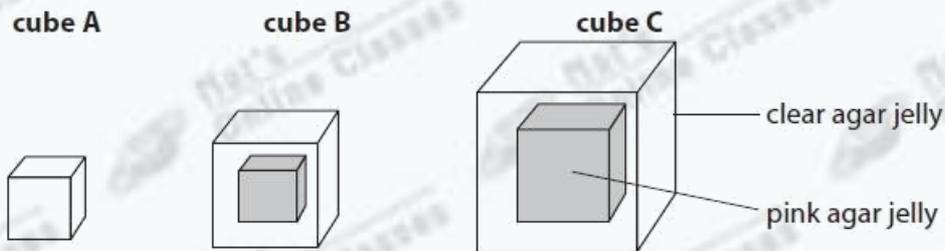


Figure 7

- (i) The distance from the outside of cube B to the pink area was 3 mm. Calculate the distance diffused by hydrochloric acid in **one** second.

(2)

..... mm

- (ii) The student wanted to confirm their results.

Give **one** improvement the student should make to this investigation to confirm their results.

(1)

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

Q5.

A student wanted to investigate the movement of water into and out of cells in potatoes. The student had the equipment shown in Figure 8.



Figure 8

The test tubes in the rack contain different concentrations of sodium chloride solution. The solutions were 0.1 M, 0.2 M, 0.3 M, 0.4 M and 0.5 M sodium chloride solution. The test tube in the beaker contains distilled water. There are three potato chips in each of the six test tubes.

(i) State why the test tube in the beaker only contains distilled water and three potato chips. (1)

.....
.....

(ii) State **two** variables that need to be controlled in this investigation. (2)

1

2

.....

(iii) Explain why the chips in the 0.5 M sodium chloride solution lost mass. (3)

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

Mark Scheme

Q1.

Question Number	Answer	Mark
(i)	To make the { cell / nucleus } more visible	(1) AO2 2
Question Number	Answer	Mark
(ii)	D cell wall The only correct answer is D <i>A is not correct because V is not a chloroplast</i> <i>B is not correct because V is not a vacuole</i> <i>C is not correct because V is not a nucleus</i>	(1) AO1 2
Question Number	Answer	Mark
(iii)	An explanation including two from: <ul style="list-style-type: none">• water moved out of cell / cytoplasm (1)• by osmosis / definition of osmosis (1)	(2) AO2 2

Q2.

Question Number	Answer	Additional Guidance	Mark
	<p>Any two from the following:</p> <ul style="list-style-type: none"> • at any point between 0 to 0.33 {mass / water} is gained (1) • from 0 to 0.33 the change in mass decreases (1) • 0.33 is where the concentration inside and outside (of the cell) is the same (1) • above 0.33 {mass / water} is lost (1) • from 0.33 to 1.0 the change in mass increases (1) 	<p>accept 0.33 mol/dm³ is the isotonic point</p>	<p>(2) AO3 2a 2b</p>

Q3.

Question number	Answer	Mark
	<p>A diffusion</p> <p>The only correct answer is A</p> <p><i>B is incorrect because respiration is the release of energy from glucose.</i></p> <p><i>C is incorrect because osmosis is the movement of water, not alcohol.</i></p> <p><i>D is incorrect because protein synthesis is how proteins are made.</i></p>	<p>(1) AO1 1</p>

Q4.

Question number	Answer	Additional guidance	Mark
(i)	Substitution $3 \div 120$ (1) 0.025 (mm)	award two marks for correct answer with no working	(2) AO2 1

Question number	Answer	Additional guidance	Mark
(ii)	Repeat (the investigation)	accept compare with results from other groups	(1) AO3 3b

Q5.

Question number	Answer	Additional guidance	Mark
(i)	<ul style="list-style-type: none">Used as a control / to compare with the results of the other tubes		(1) AO1.2

Question number	Answer	Mark
(ii)	Any two variables from: <ul style="list-style-type: none">temperature (1)age / variety of potato (1){size / volume / length / width / shape / mass / surface area} of chip (before investigation) (1)volume of solution (1)time left in solutions (1)	(2) AO1.2

Question number	Answer	Mark
(iii)	<p data-bbox="448 309 820 344">An explanation including:</p> <ul data-bbox="501 421 1166 875" style="list-style-type: none"><li data-bbox="501 421 1166 645">• There is a higher concentration of sodium chloride outside (the cell) than inside / higher concentration of water molecules inside (the cell) than outside (1)<li data-bbox="501 696 1107 779">• water moves out of {cells / chips} / into (sodium chloride) solution (1)<li data-bbox="501 831 778 875">• by <u>osmosis</u> (1)	(3) AO1.2