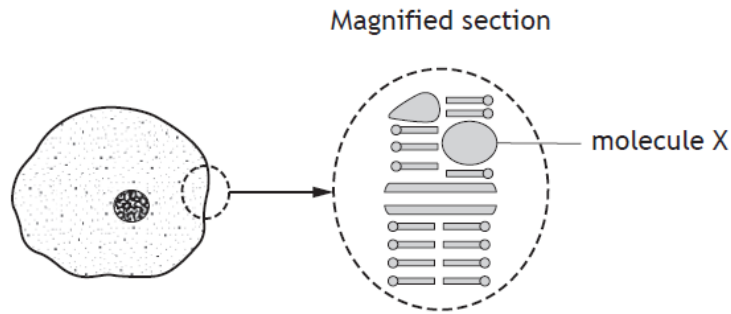


Unit 1 Cell Biology Revision Questions

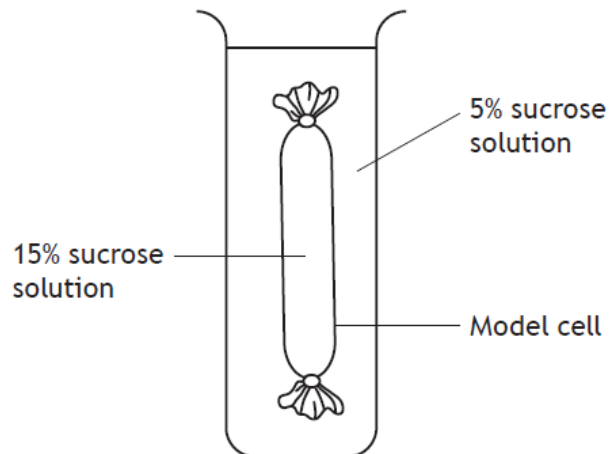
Key Area 2 Transport Across Membranes

1. The diagram shows a cell with a section of the cell membrane magnified.



Molecule X is

- A phospholipid
 - B protein
 - C cellulose
 - D starch.
2. The diagram shows an experiment in which a model cell was placed in a sucrose solution.



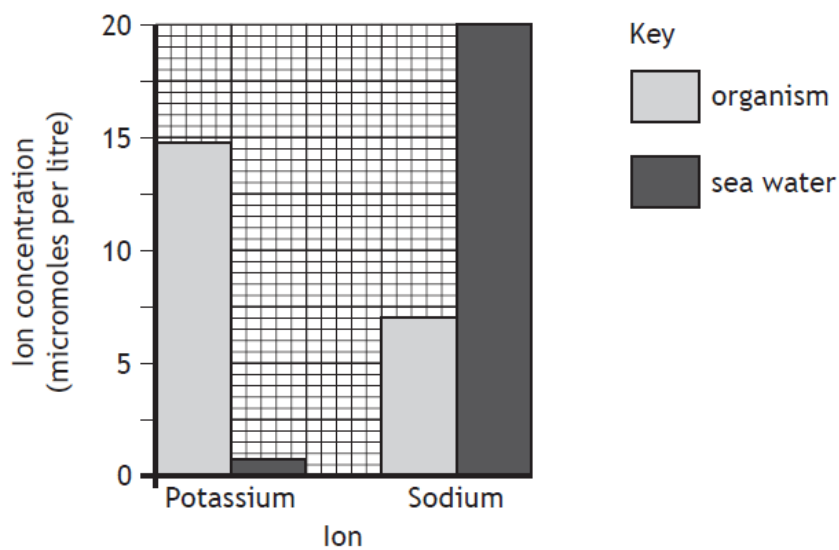
At the start of the experiment the model cell weighed 25 g and at the end it weighed 30 g.
What was the percentage increase in mass?

- A 5.0%
- B 16.7%
- C 20.0%
- D 83.3%

3. Glucose molecules in low concentration in the kidney have to be moved into the bloodstream, where there is a higher concentration of glucose.

The process responsible for this action is

- A osmosis
 - B diffusion
 - C passive transport
 - D active transport.
4. The graph shows the concentrations of ions in a single-celled organism and the sea water surrounding it.



Use the graph to identify which of the following statements is correct.

- A Sodium ions will move into the organism by active transport.
- B Sodium ions will move out of the organism by diffusion.
- C Potassium ions will move out of the organism by active transport.
- D Potassium ions will move into the organism by active transport.

5.

Four cylinders of potato tissue were weighed and each was placed into a salt solution of a different concentration.

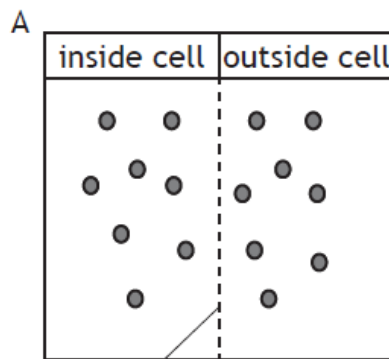
The cylinders were reweighed after one hour and the results are shown below.

<i>Salt Solution</i>	<i>Initial mass of potato cylinder (g)</i>	<i>Final mass of potato cylinder (g)</i>
A	10.0	7.0
B	10.0	9.4
C	10.0	11.2
D	10.0	12.6

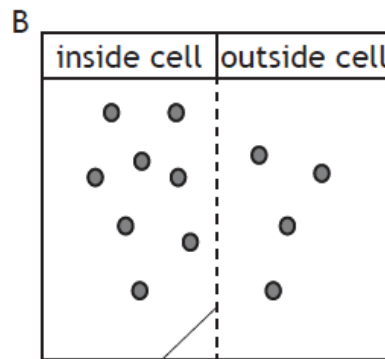
In which salt solution would most potato cells be plasmolysed?

6.

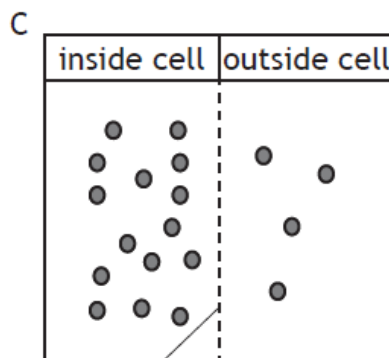
In the diagrams below, the circles represent molecules on either side of a cell membrane. In which of these diagrams would the molecules move into a cell by diffusion?



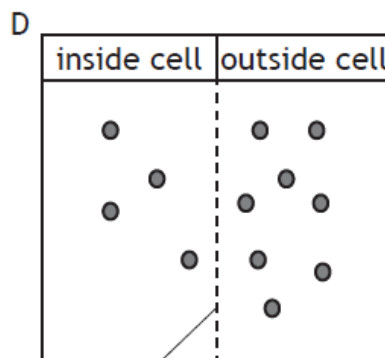
cell membrane



cell membrane



cell membrane



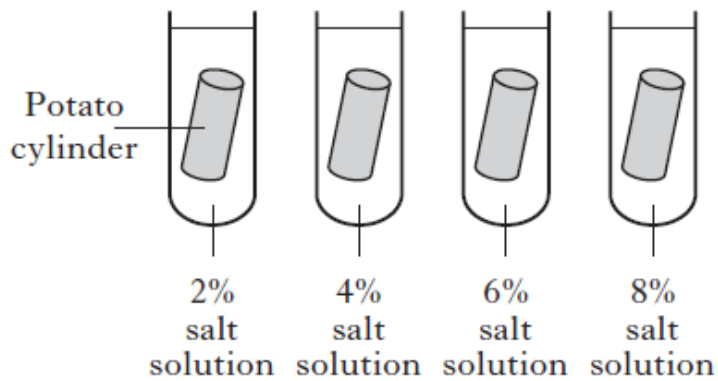
cell membrane

7. Which line in the table below identifies the direction of diffusion of the three substances during muscle contraction?

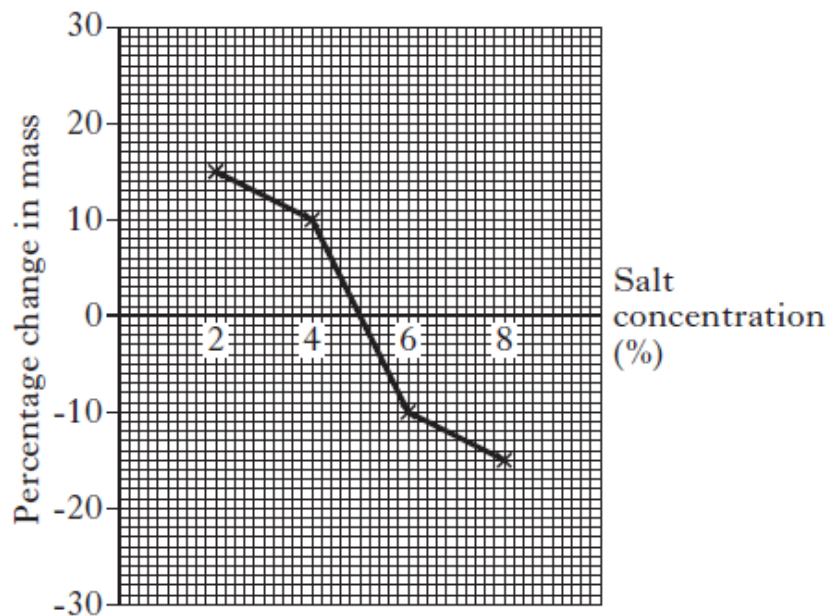
	<i>Substance</i>		
	<i>Glucose</i>	<i>Oxygen</i>	<i>Carbon dioxide</i>
A	out	out	in
B	in	out	in
C	out	in	out
D	in	in	out

Questions 8 & 9 refer to the investigation described below.

Four potato cylinders of equal mass were placed in four separate test tubes as shown below.



After two hours, the percentage change in mass of each cylinder was calculated and the results plotted on the graph below.



8. In which concentration of salt would the potato cylinders be most plasmolysed?

- A 8%
- B 5%
- C 2%
- D 0%

9. When the experiment was repeated with 10% salt the initial mass was 20 g and the final mass was 16.8 g.

What was the percentage decrease in mass?

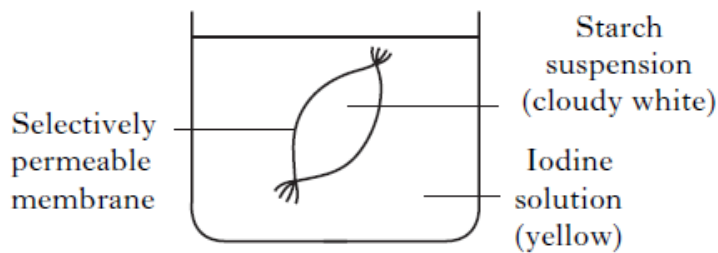
- A 3.2%
- B 16%
- C 20%
- D 84%

10. Which line in the table below shows what happens to cells when placed in a strong salt solution?

	<i>Animal Cell</i>	<i>Plant Cell</i>
A	swells and bursts	becomes turgid
B	becomes turgid	swells and bursts
C	shrinks	becomes plasmolysed
D	becomes plasmolysed	becomes plasmolysed

11. The diagram below shows a model cell that was set up to investigate diffusion through a selectively permeable membrane.

Iodine is a small, soluble molecule.



Predict the colour changes which would be observed after one hour.

<i>Colour change after one hour</i>		
	<i>Starch suspension</i>	<i>Iodine solution</i>
A	remained cloudy white	yellow to blue/black
B	cloudy white to blue/black	remained yellow
C	remained cloudy white	remained yellow
D	cloudy white to blue/black	yellow to blue/black

12. Four thin sections of onion tissue were immersed in 5% sugar solution.

The sections were left for 15 minutes then viewed under a microscope.

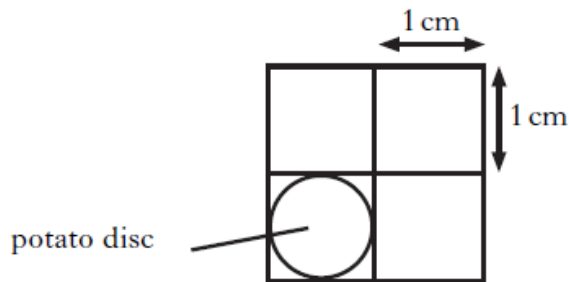
The table below shows the percentage of cells plasmolysed in each section.

<i>Section</i>	<i>Cells plasmolysed (%)</i>
1	44
2	44
3	54
4	58

The average percentage of cells plasmolysed is

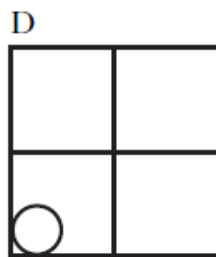
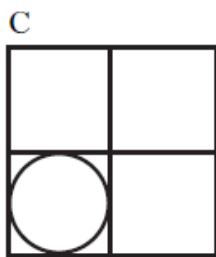
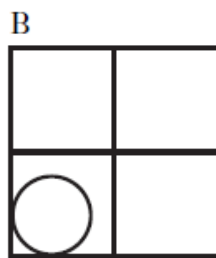
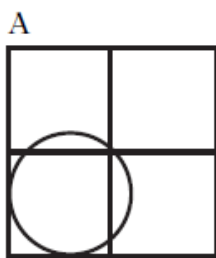
- A 44
- B 50
- C 54
- D 200.

13. The diagram below shows the initial diameter of a potato disc.



The potato disc was placed in pure water for one hour.

Which of the following diagrams shows correctly the change in the diameter of the potato disc?



14. Which line in the table below identifies correctly the importance of diffusion to an animal cell?

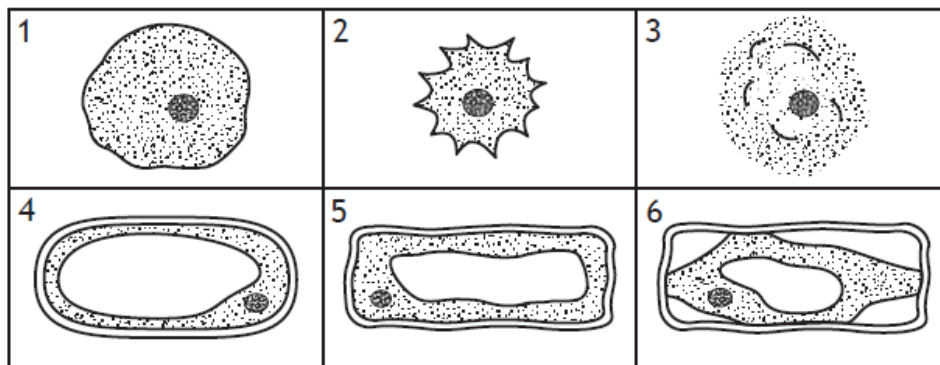
	<i>Raw material gained</i>	<i>Waste product removed</i>
A	oxygen	glucose
B	carbon dioxide	oxygen
C	oxygen	carbon dioxide
D	glucose	oxygen

15. Which of the following molecules can both diffuse through a cell membrane?
- A Amino acids and starch
 - B Amino acids and water
 - C Starch and protein
 - D Protein and water

16. A student examined plant and animal cells using a microscope.



The animal and plant cells were placed in solutions of different salt concentrations. After several minutes a sample of cells was taken from each solution and examined. One cell from each solution is shown.



(a) Changes in the cells were due to osmosis.

Explain why osmosis is described as a passive process.

1

(b) Identify the animal cell shown which had been placed in a solution of higher salt concentration than its cell contents.

1

Cell number _____

(c) State the term used to describe the condition of cell 6.

1

(d) Cells 3 and 4 had been placed in solutions which were both of the same concentration.

Explain why the results observed were different.

2

17.

- (a) State a feature of the cell membrane which allows the movement of only some substances into the cell. 1

- (b) Osmosis is a process which can occur across the cell membrane.

- (i) Choose either the leaf cell or red blood cell by ticking (✓) one of the boxes below.

Describe the effect of osmosis on this type of cell if it was placed in pure water. 1

Leaf cell Red blood cell

Effect on the cell _____

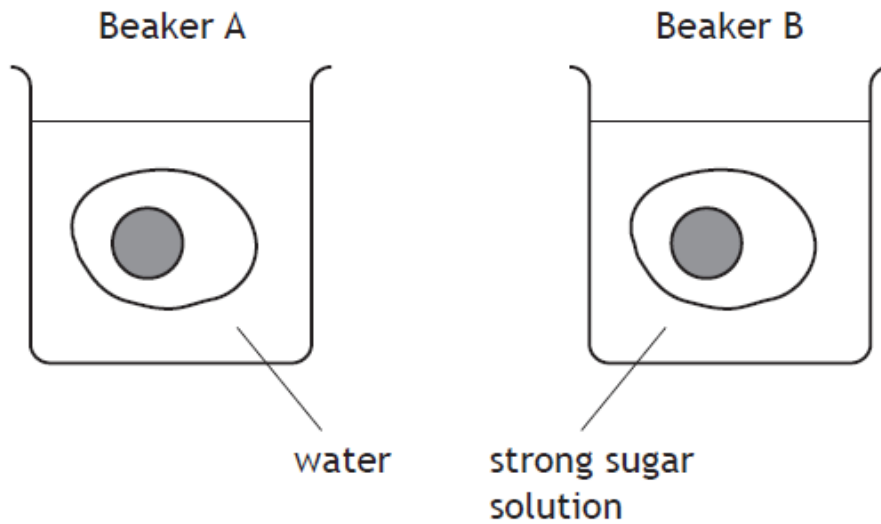
- (ii) 1 Name a process, other than osmosis, which allows molecules to pass through the cell membrane. 1

- 2 Give a definition of the process chosen. 1

18.

- (a) Shells can be removed from eggs by dissolving them in vinegar for 2–3 days. The egg contents remain inside a thin membrane.

In an investigation the shells from two eggs were removed. The eggs were then weighed and placed in beakers as shown below.



After 2 hours the eggs were removed from the beakers, blotted dry and reweighed. The results are shown in the following table.

<i>Beaker</i>	<i>Mass at start (g)</i>	<i>Mass after 2 hours (g)</i>	<i>Percentage change in mass</i>
A	54.0	67.5	
B	52.1	47.8	-8.2

- (i) Complete the table by calculating the percentage change in mass for beaker A.

Space for calculation

1

- (ii) Suggest why the eggs were blotted dry before being reweighed.

1

(a) (continued)

- (iii) Choose either beaker A or B and explain how osmosis caused the change in mass of the eggs in that beaker. 2

Beaker _____

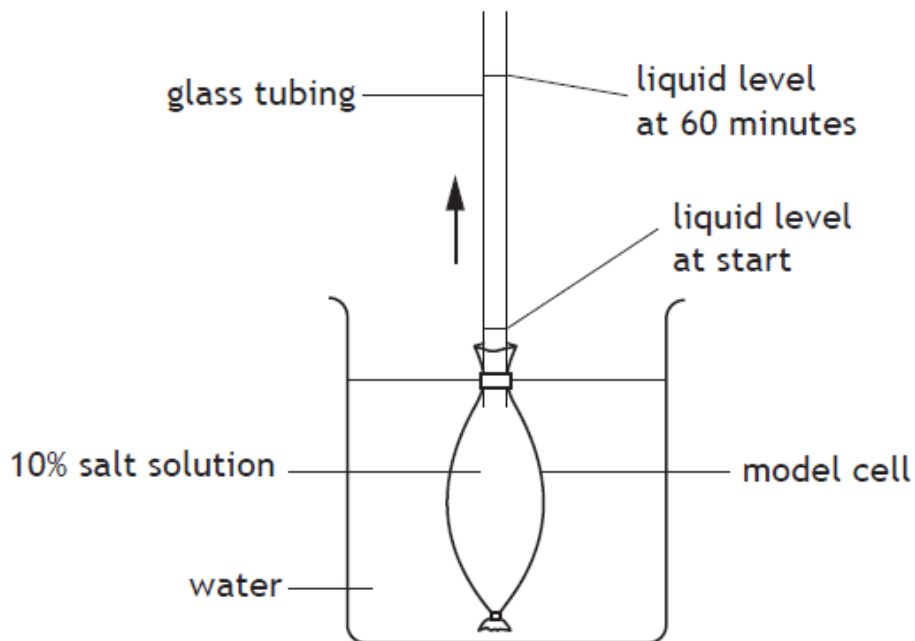
Explanation _____

- (b) The movement of molecules in or out of cells can be by passive or active transport.

Describe one difference between passive and active transport. 1

19.

The apparatus shown below was used to investigate the movement of water into and out of a model cell. The model cell had a selectively permeable membrane.



The liquid level in the glass tubing was measured every 10 minutes for 60 minutes.

The results are shown in the table below.

<i>Time (minutes)</i>	<i>Liquid level (mm)</i>
0	10
10	22
20	32
30	40
40	48
50	56
60	64

(a) Name the process which caused the liquid level to rise.

1

(continued)

- (b) Explain how this process caused the liquid level to rise. 2

- (c) Calculate the average rate of movement of liquid in the glass tubing. 1

Space for calculation

_____ mm per minute

- (d) When the investigation was repeated, the average rate of movement of liquid was slower.

Suggest one difference in the way that the investigation was set up that could have caused this change in results. 1
