

GCSE Biology (9 – 1)

Transport across the membrane

Name:

Group:

Instructions

- Read each question carefully before you begin to answer it.
- Use black ink or black ball-point pen for your answers.
- Fill in the boxes at the top of this page with your name and group.
- Attempt to answer every question in the booklet.
- Answer the questions in the spaces provided – there may be more space than you need in some answer spaces.
- Calculators may be used for this booklet.
- For any calculations, you **must** show all your working.
- Any and all drawings or graphs should be completed in pencil.



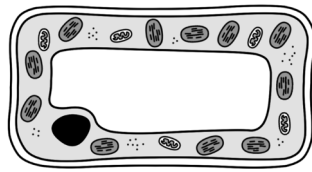
For markers use	
Question	Mark
1	/4
2	/10
3	/14
4	/9
5	/6
6	/7
Total	/50
%	
Grade	

Information

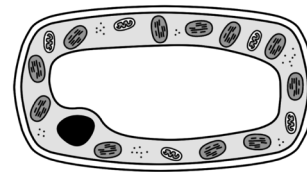
- The maximum mark for this paper is 50 marks.
- The marks for each question are shown in brackets.
- Please be aware that good English and clear presentation are required in your answers.



1. Cell transport is essential for life. Answer each of the following multiple-choice questions relating to cell transport processes.
- a) The figure below shows how a plant cell appears under a light microscope at the beginning of a practical and how it appears after it has been placed in a dilute solution of glucose for 10 minutes.



Beginning of the practical



End of the practical

Which of the following statements accurately describes the process?

- A** More sugar molecules pass through the membrane from the solvent than move to the solvent.
- B** More sugar molecules pass through the membrane from the cell than move from the solvent.
- C** More water molecules pass through the membrane from the solvent than move to the solvent.
- D** More water molecules pass through the membrane from the cell than move from the solvent.

(1 mark)

- b) Which process in humans does not use energy released from respiration?

Diffusion of oxygen

Cell division

Muscle contraction

Protein synthesis

A

B

C

D

(1 mark)

- c) How do carbon dioxide and oxygen move in and out of a mesophyll cell?

Respiration

Diffusion

Transpiration

Active transport

A

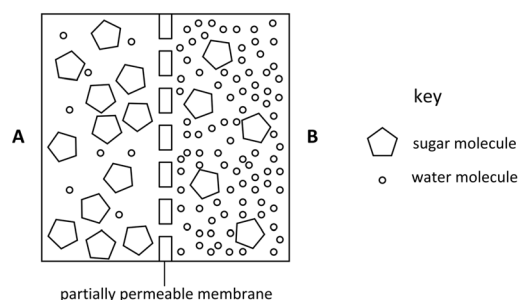
B

C

D

(1 mark)

- d) The figure below shows sugar molecules and water on either side of a partially permeable membrane.



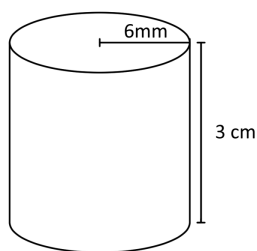
What happens during osmosis?

- A** More sugar molecules pass through the membrane from A to B than from B to A.
- B** More sugar molecules pass through the membrane from B to A than from A to B.
- C** More water molecules pass through the membrane from A to B than from B to A.
- D** More water molecules pass through the membrane from B to A than from A to B.

(1 mark)

(Total for Question 1 is 4 marks)

2. A student conducted a practical to investigate the movement of water in potatoes.
The student cut five identical cylinders of potato. The figure below shows one of those cores.



- a) Calculate the volume of this cylinder of potato.
Give your answer to 3 significant figures.

Volume = ... mm³
(3 marks)

One cylinder was placed in water and each of the other two cylinder were placed in solutions with different concentrations of salt. The cylinders were left for 30 minutes.
The table below shows the student's results.

Solution	Initial Mass (g)	Final Mass (g)
Dilute salt solution	1.40	1.48
Water	1.40	1.51
Concentrated salt solution	1.42	1.32

- b) State **one** thing the student could do to ensure the measurement of the mass of the cylinder is accurate.

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(1 mark)

- c) Calculate the percentage change in mass for the potato core in the concentrated salt solution.

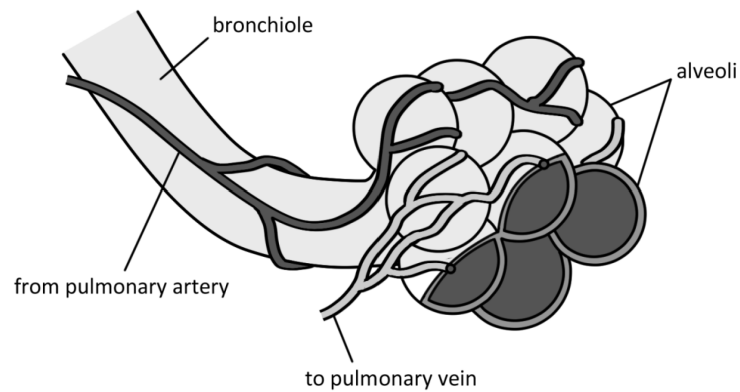
Percentage change in mass = ...
(3 marks)

- d) Explain the change in mass for the cylinder core that was in the concentrated salt solution.

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(3 marks)

(Total for Question 2 is 10 marks)

3. The figure below shows some of the alveoli present in a human lung.



a) Explain how alveoli are adapted for gas exchange.

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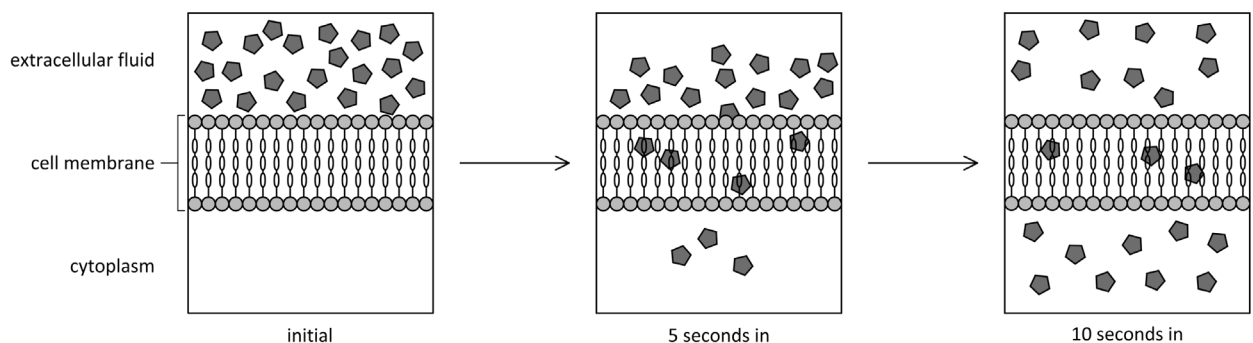
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(3 marks)

The figure below shows the movement of molecules across a membrane.



b) Using the figure, describe the molecular movement across the membrane.

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(2 marks)

c) What is active transport?

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(3 marks)

4. Water can move into and out of plant cells by osmosis.

a) Describe the process of osmosis.

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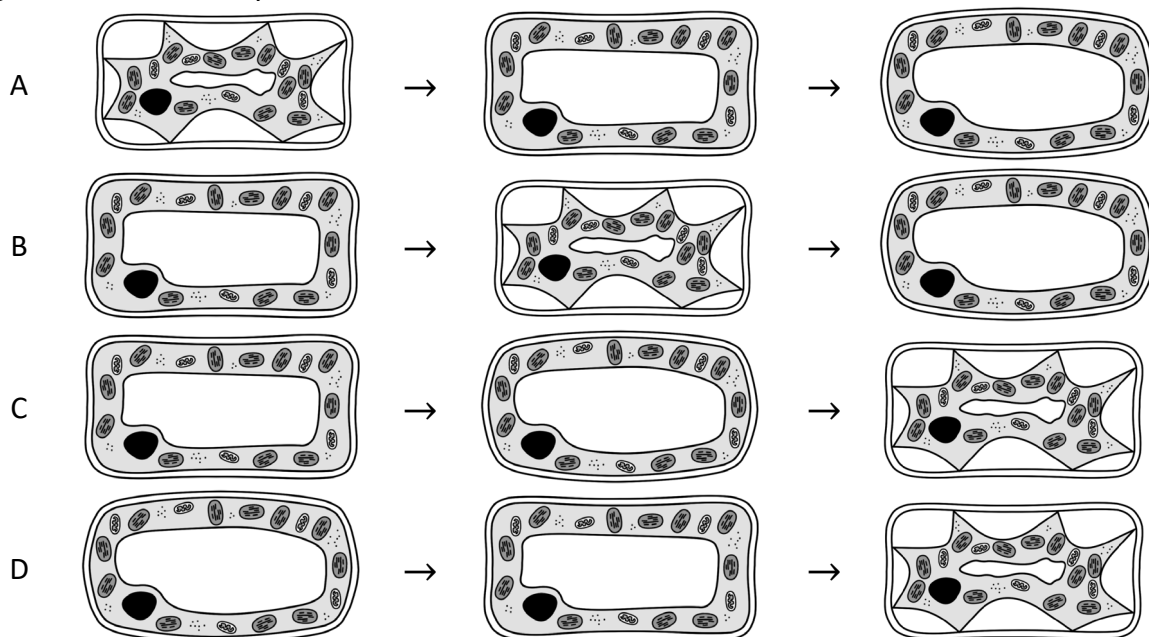
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(3 marks)

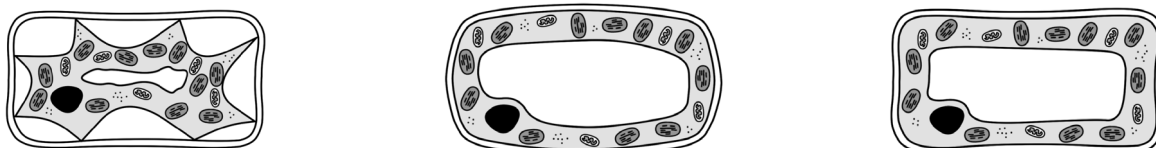
b) Which diagram shows the changes in appearance of a plant cell when it remains in a concentrated sugar solution for thirty minutes? Circle the letter of the correct answer.



(1 mark)

The figure below shows plant cells. One cell has too little water in the cell, one cell has the normal amount of water within in and one cell has too much water in the cell.

c) Provide the term used to describe each cell in the figure below.



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(3 marks)

d) Red blood cells will burst when too much water moves into them.
Explain why plant cells will not burst when water moves into the cells.

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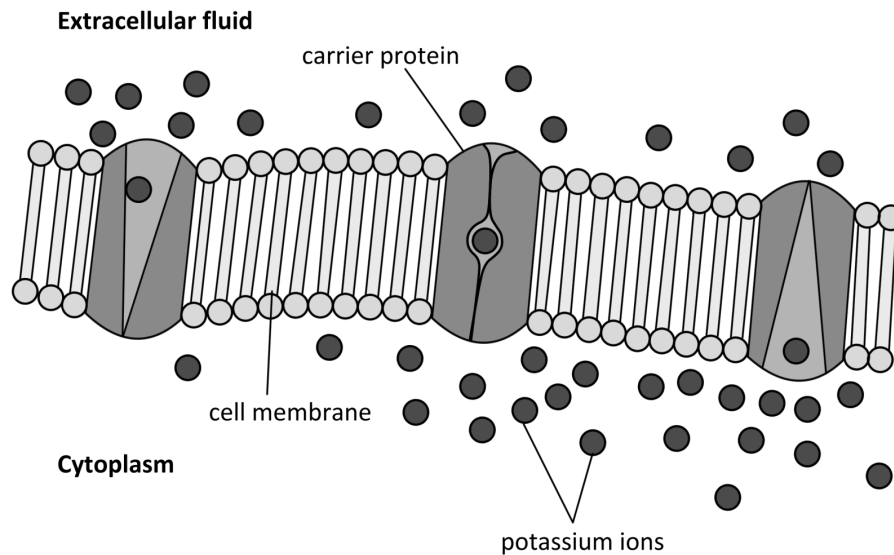
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(2 marks)

(Total for Question 4 is 9 marks)

6. The figure below shows a section of a cell membrane of an animal cell.



a) Identify the type of transport shown in the figure above.

(1 mark)

b) Describe how this type of transport works and why it requires energy.

(4 marks)

c) Give **one** example of where this type of transport occurs in the human body, and explain why it is essential in that location.

(2 marks)

(Total for Question 6 is 7 marks)