3. Movement into and out of cells

3.3 Active transport

Paper 1 and 2

Question Paper

Paper 1

Questions are applicable for both core and extended candidates

1 What is a feature of active transport?

A It requires energy from respiration.

B It involves the random movement of molecules.

C Substances are moved down a concentration gradient.

D Water is the only substance moved by this process.

2 What is a correct statement about active transport?

A Particles move into cells, using energy released by photosynthesis.

B Particles move across a cell wall without using energy.

C Particles move from a region of higher concentration to a region of lower concentration.

D Particles move across a cell membrane, using energy released by respiration.

3 Which row describes active transport?

	movement of water	uses energy from respiration	movement through a cell membrane
A	yes	no	no
B	yes	no	yes
C	no	yes	no
D	no	yes	yes

4 What is the colour change shown by Benedict's solution when heated with a reducing sugar?

A blue to purple

B blue to red

C brown to blue-black

D red to yellow

5 Which row describes active transport of ions?

	direction of movement of ions	requires energy from respiration
A	from high concentration to low concentration	yes
B	from low concentration to high concentration	no
C	from high concentration to low concentration	no
D	from low concentration to high concentration	yes

6 The concentration of sodium ions in the soil is lower than the concentration inside root hair cells.

Which process will be used when sodium ions are taken into root hair cells from the soil?

A active transport

B diffusion

C osmosis

D transpiration

7 Cyanide is a poison that stops respiration. A paramecium is a single-celled freshwater organism.

What is the most likely effect of cyanide in a paramecium?

A increased active transport

B decreased osmosis

C decreased active transport

D increased osmosis

8 The cells in a plant root have a higher concentration of magnesium ions than in the surrounding soil.

Which process will move the magnesium ions into the root?

A active transport

B diffusion

C osmosis

D transpiration

9 What are the features of active transport?

	occurs through a cell membrane	particles move from a higher to a lower concentration	uses energy from respiration
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

10 Which process requires energy from respiration?

A active transport

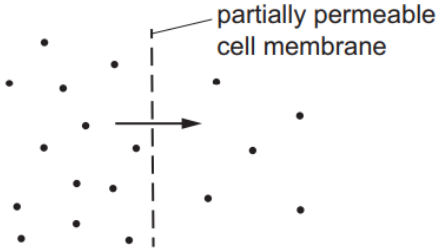
B diffusion

C osmosis

D transpiration

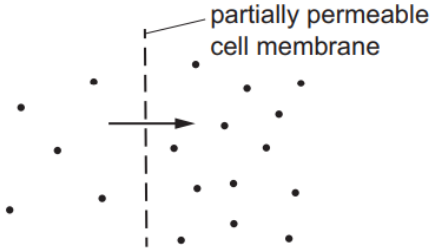
11 Which diagram represents active transport?

A



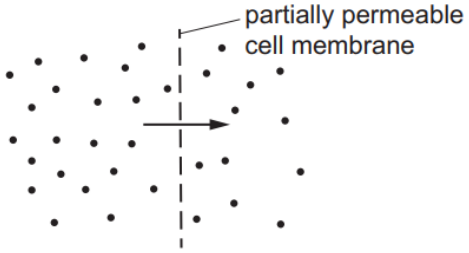
requires energy
from respiration

B



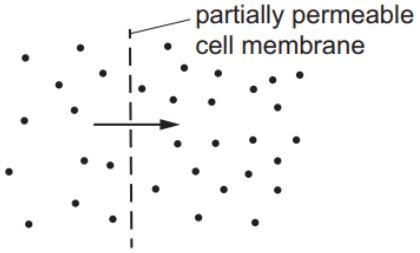
requires energy
from respiration

C



does **not** require energy
from respiration

D



does **not** require energy
from respiration

12 The concentration of nitrate ions is higher inside a root hair cell than in the soil.

What would be required for the absorption of nitrate ions into the root hair cell? **(extended only)**

1 mitochondria

2 oxygen

3 membrane proteins

4 cell wall

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 1 and 2 only

D 1 only

13 Which statements about active transport are correct? **(extended only)**

1 It transports particles from a low concentration to a high concentration.

2 It always transports particles into cells.

3 It involves protein molecules in the cell membrane.

4 It uses energy from respiration.

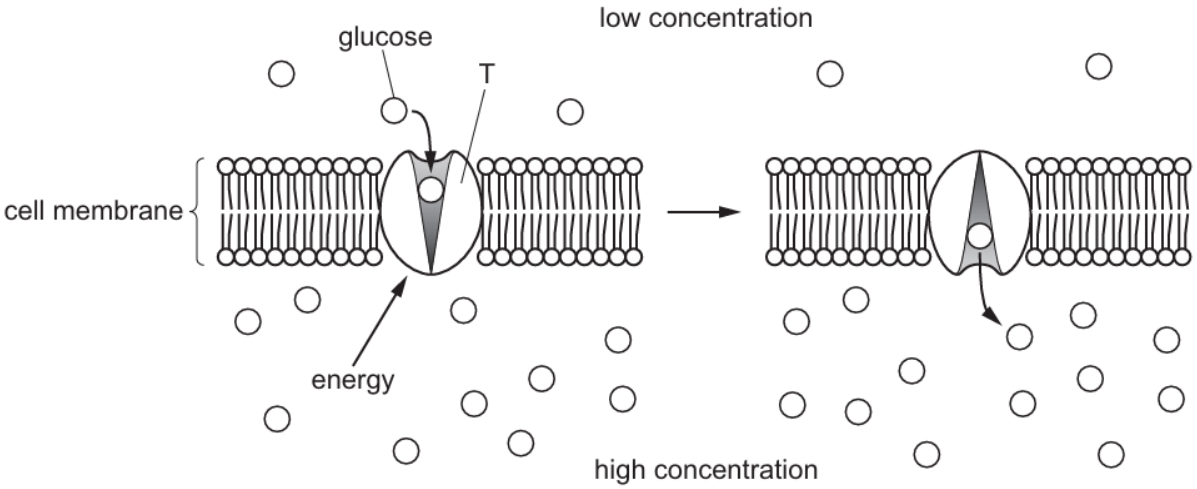
A 1, 2, 3 and 4

B 1, 3 and 4 only

C 1 and 2 only

D 3 and 4 only

14 The diagram shows the movement of glucose molecules across a cell membrane.



Which statement describes molecule T? **(extended only)**

A It is a fat molecule used to transport glucose down a concentration gradient.

B It is a fat molecule used to transport glucose against a concentration gradient.

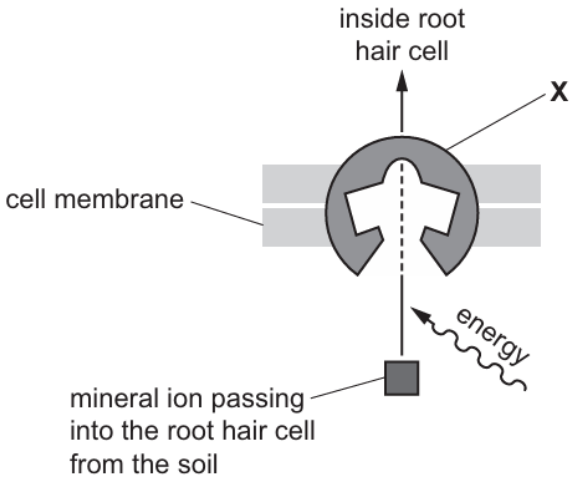
C It is a protein molecule used to transport glucose down a concentration gradient.

D It is a protein molecule used to transport glucose against a concentration gradient.

15 Which row shows the changes that occur during the germination of a seed? **(extended only)**

	respiration rate	amount of energy required	how ions are absorbed
A	decreased	decreased	active transport
B	decreased	increased	diffusion
C	increased	decreased	diffusion
D	increased	increased	active transport

16 The diagram shows the uptake of mineral ions by root hair cells.



Which type of molecule is labelled **X** in the diagram? **(extended only)**

A glucose

B lipid

C protein

D starch

17 Which process is involved in the uptake of glucose by the epithelial cells of kidney tubules? **(extended only)**

A active transport

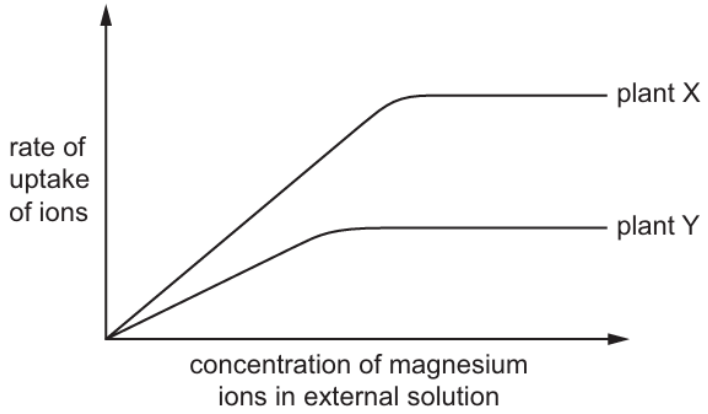
B osmosis

C translocation

D transpiration

18 The graph shows the rate of uptake of magnesium ions by two similar plants, X and Y.

The roots of each plant were placed in a range of solutions. Each solution contained a different concentration of magnesium ions. All other conditions were kept constant.



What is a possible explanation for the difference in the results for the two plants? **(extended only)**

A Plant Y has fewer protein molecules for magnesium ion transport in its cell membranes.

B Plant Y has a higher rate of respiration.

C Plant Y has more root hair cells.

D The root hair cells in plant Y have a lower water potential.

19 Which process depends on active transport? **(extended only)**

A absorption of carbon dioxide by plant leaves

B reabsorption of glucose by kidney tubules

C removal of carbon dioxide in the alveoli

D uptake of water by plant roots