Cell membranes and transport – AS 9700 Biology Nov 2022

1.
   Which statement is correct for facilitated diffusion **and** active transport?

   A   As the direction of the concentration gradient changes so does the direction of movement of the molecules.

   B   Molecules always move at the same rate as simple diffusion.

   C   Specific molecules are transported across a membrane.

   D   The molecule ATP is required to move specific molecules quickly through proteins in the membrane.

2.
   A cuboidal epithelium cell has a length of $2\,\mu m$.

   The cell is an approximate cube shape.

   What is the most accurate estimate of the surface area : volume ratio of this cuboidal epithelium cell?

   A $1:2$ B $1:3$ C $2:1$ D $3:1$

3.
   Equal sized potato pieces were placed into a test-tube and covered with a sucrose solution. The test-tube was left for 30 minutes. All other variables were standardised.

   After 30 minutes, the potato piece had not changed in size.

   What can be concluded from this result?

   A   The concentration of sucrose is the same in the potato and in the solution and there is no more movement of water into or out of the potato.

   B   The concentration of sucrose is the same in the potato and in the solution and there is no net movement of water into the potato.

   C   The water potential is the same in the potato and in the sucrose solution and there is no more movement of water into or out of the potato.

   D   The water potential is the same in the potato and in the sucrose solution and there is no net movement of water into or out of the potato.

4.

Which statements about triglycerides **and** phospholipids are correct?

1   Fatty acids in a triglyceride may be saturated or unsaturated but in a phospholipid they are always saturated.

2   Triglycerides and phospholipids both have a hydrophobic region.

3   Triglycerides are non-polar molecules and phospholipids are polar molecules.

A   1 and 2   **B**   1 only   **C**   2 and 3   **D**   3 only

5.

The diagram represents a process by which molecules move out of a cell through a cell surface membrane.
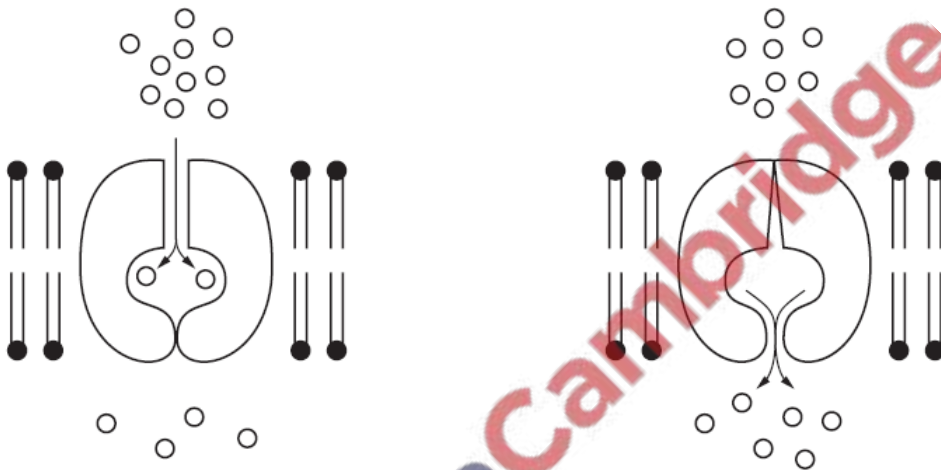
Which process does this represent?

A   exocytosis

B   diffusion

C   facilitated diffusion

D   osmosis

6.

Which functions are performed by glycoproteins on the surface of a cell surface membrane?

1   to act as enzymes catalysing reactions in the membrane

2   to have a specific site where chemicals can bind

3   to secrete specific chemicals used for cell signalling

**A**   1, 2 and 3   **B**   2 and 3 only   **C**   2 only   **D**   3 only

7.

Which features are correct for active transport **and** facilitated diffusion?

1   The movement of molecules and ions depends on ATP.

2   They are specific for one type of molecule or ion.

3   They use membrane proteins.

A   1 and 2   **B**   1 and 3   **C**   2 and 3   **D**   3 only

8.

The diagram represents two solutions, P and Q, that were separated by a partially permeable dialysis tubing.
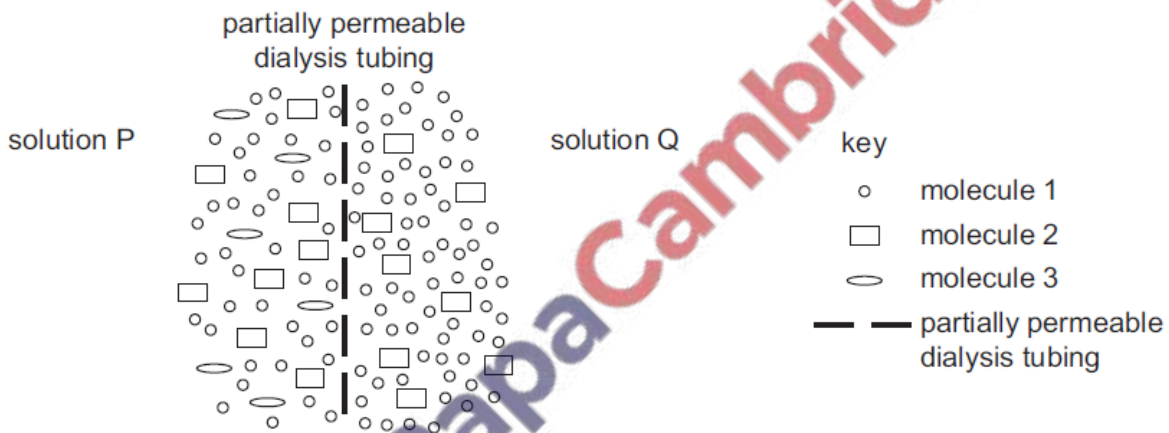
What will be the initial movement of the molecules, 1, 2 and 3, between solution P and solution Q?

	net movement from Q to P	net movement from P to Q	no net movement
A	molecule 1	molecule 2	molecule 3
B	molecule 1	molecule 3	molecule 2
C	molecule 2	molecule 3	molecule 1
D	molecule 3	molecule 1	molecule 2

9.
A student weighed a cylinder of potato and then put it into a test-tube containing a salt solution.

The potato cylinder was removed from the salt solution after one hour. It was blotted dry and then reweighed. The student recorded that the potato had lost mass.

Which row shows the correct explanation for the results the student collected?

	water potential of the potato cells before soaking compared to the water potential after soaking	condition of the potato cells after soaking
A	higher	plasmolysed
B	higher	turgid
C	lower	plasmolysed
D	lower	turgid