

1. Compare the processes of passive transport, facilitated transport, and active transport.

	Passive Transport	Facilitated Transport	Active Transport
a. Does the process require energy?			
b. What special membrane proteins, if any, are needed?			
c. Describe a specific example in a cell.			

2. ~~Releasing fish into a pond and seeing them swim in all directions is most like the process of~~

- ~~a. osmosis~~ ~~d. osmoregulation~~
~~b. diffusion~~ ~~e. pinocytosis~~
 c. active transport

3. If someone sitting at the other end of a restaurant smokes a cigarette, you may still breathe in some of that smoke. The movement of smoke through the air of the restaurant is an example of what type of transport?

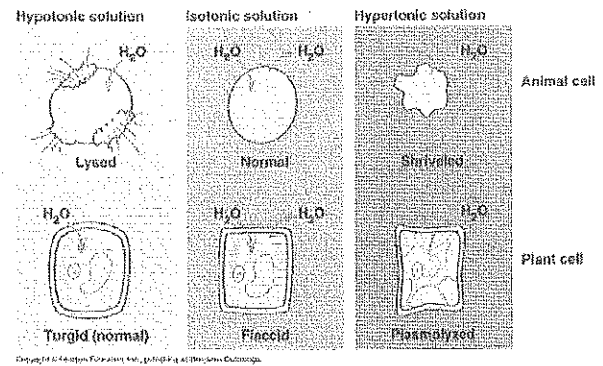
- a. osmosis d. facilitated diffusion
 b. diffusion e. exocytosis
 c. active transport

4. If you soak your hands in dishwater, you may notice that your skin soaks up water and swells into distinct wrinkles. This is because your skin cell are _____ to the _____ dishwater.

- a. hypotonic...hypertonic
 b. hypertonic...hypotonic
 c. isotonic...hypertonic
 d. isotonic...hypotonic
 e. hypertonic...isotonic

5. Examine the figure to the right. Why does the animal cell but not the plant cell lyse when it is placed in a hypotonic solution?

- a. The plant cell is less hypertonic.
 b. The plant cell wall keeps the cell from lysing.
 c. The plant cell does not absorb as much salt.
 d. The water cannot easily diffuse through the plant cell wall.
 e. None of the above.



6. The total solute concentration in a red blood cell is about 2%. Sucrose cannot pass through a red blood cell's plasma membrane, but water and urea can. Osmosis will cause such a cell to shrivel the most when the cell is immersed in which of the following?

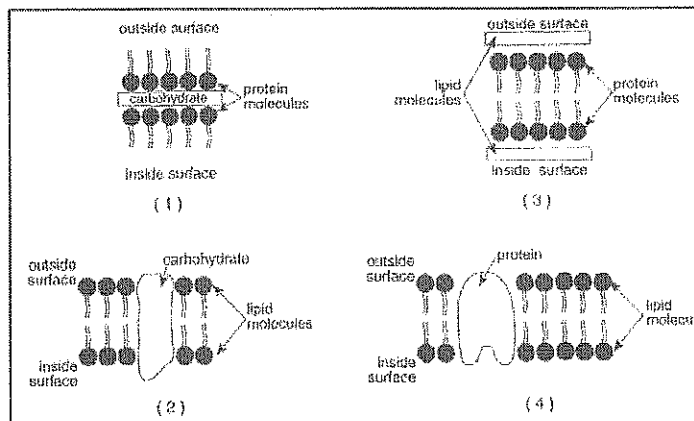
- a. a hypertonic sucrose solution d. a hypotonic urea solution
 b. a hypotonic sucrose solution e. an isotonic sucrose solution
 c. a hypertonic urea solution

7. Plasma membranes are selectively permeable because they _____.

- a. allow all substances to cross. d. plasma membranes are not selectively permeable.
 b. allow certain substances to cross.
 c. allow no substances to cross. e. none of the above

8. Which diagram displayed below best represents the fluid-mosaic model of a cell membrane?

- a. 1
- b. 2
- c. 3
- d. 4
- e. none of the above



9. Which of the following types of cellular transport require(s) an expenditure of energy?

- a. facilitated diffusion
- b. active transport
- c. osmosis
- d. both a and b
- e. both b and c

10. Osmosis can be defined as _____.

- a. the diffusion of water.
- b. the diffusion of nonpolar molecules.
- c. active transport.
- d. the diffusion of a solute.
- e. the movement of water from a hypertonic solution to a hypotonic solution.

11. All of the following describe active transport EXCEPT?

- a. Requires membrane proteins.
- b. Can move solutes against the concentration gradient.
- c. Requires the cell to expend energy.
- d. Moves solutes with the concentration gradient.
- e. neither c or d describes active transport

12. Moving a molecule across a membrane and against its concentration gradient requires

- a. phospholipids using active transport
- b. phospholipids using passive transport
- c. membrane transport proteins using passive transport
- d. membrane transport proteins using active transport
- e. membrane transport proteins using receptor-mediated transport

13. Which one of the following is a type of endocytosis in which very specific molecules are brought into a cell using specific membrane protein receptors?

- a. osmoregulation
- b. phagocytosis
- c. pinocytosis
- d. receptor-mediated endocytosis
- e. none of the above

14. In _____, the cell takes in droplets of fluid by forming tiny vesicles.

- a. phagocytosis
- b. pinocytosis
- c. exocytosis
- d. receptor-mediated endocytosis
- e. passive transport

15. A plant cell is placed in a solution whose solute concentration is twice as great as the concentration of the cell cytoplasm. The cell membrane is selectively permeable, allowing water but not the solutes to pass through. What will happen to the cell?
- No change will occur because it is a plant cell.
 - The cell will shrivel because of osmosis.
 - The cell will swell because of osmosis.
 - The cell will shrivel because of active transport.
 - The cell will swell because of active transport.
16. A white blood cell is capable of producing and releasing thousands of antibody molecules every second. Antibodies are large, complex protein molecules. How would you expect them to leave the cell?
- active transport
 - receptor-mediated endocytosis
 - passive transport
 - exocytosis
 - pinocytosis
17. Which of the following would least likely diffuse through a cell membrane without the help of a transport protein?
- a large polar molecule
 - a small polar molecule
 - a large nonpolar molecule
 - a small nonpolar molecule
 - any of the above would easily diffuse through the membrane
18. Which of the following may affect the rate of diffusion?
- temperature
 - molecule size
 - concentration gradient
 - both a and b
 - a, b, and c
19. In which of the following is solution X hypotonic relative to solution Y?
- solution X has a greater solute concentration than solution Y
 - solution X has a lower solute concentration than solution Y
 - solution X has the same solute concentration as solution Y
 - solution Y has a lower solution concentration than solution X
 - none of the above

Optional essays: You should be able to answer the following types of essay questions. The more detail you include, the better you will be prepared.

- Describe the structure of a cell membrane (i.e. what makes up the membrane).
- What is it about the *structure* of a cell membrane that allows it to be *selectively* permeable?
- Explain the fluid-mosaic model used to describe the plasma membrane.
- Explain what happens to an animal cell that is placed in a:
 - Hypotonic solution
 - Hypertonic solution
 - Isotonic solution
- Explain what happens to a plant cell that is placed in a:
 - Hypotonic solution
 - Hypertonic solution
 - Isotonic solution
- Explain how a *Paramecium* that lives in freshwater deals with the constant uptake of water.
- Describe how the sodium-potassium pump functions.
- Compare and contrast (meaning give the similarities and differences) the 3 different types of endocytosis.
- Explain which kind of molecules would use the following: diffusion, osmosis, facilitated diffusion, and active transport.
- Explain the key differences between passive transport and active transport.