BSCS Study Guide Chapter 4

1. What does the cell membrane regulate the flow of?

2. What can you tell me about the molecules of a cell membrane?

3. List the components of the cell membrane.

4. Give the name of the "tail" of the phospholipids molecules which tend to repel ions but will allow fat-soluble molecules pass through.

5. What regulates the passage of materials in and out of the cell?

6. What is the role of transport proteins?

7. What is the role of glycolipids and glycoproteins which are embedded in cell membranes?

8. Define: diffusion.

9. Why do molecules diffuse across a concentration gradient?

10. What prevents bacterial cells from (too much) swelling?

11. Why can concentration gradients from across a cell membrane?

12. If an animal cell is placed in pure water, osmosis will cause it to _____.

13. Why would plant roots, which are covered with fine root hairs, increase the ability of the plant to absorb water and nutrients from the soil?

14. Use the figure [drawn] from board in class to answer the following questions. Remember there is glucose on both sides of the selective permeable membrane.

a. If the original levels of the liquid were equal how would you describe the original glucose concentration on the left side?

b. When the system reaches equilibrium how would you describe the glucose concentration on the left side?

c. When at equilibrium the total amount of glucose on the left side would increase, decrease or stay the same.

d. When at equilibrium how would you describe the total amount of glucose on the left and right hand side of the beaker?

15. Define: passive transport.

16. Define: active transport.

17. Give an example from your text of passive transport.

18. Does facilitated diffusion move against, with or independent of a concentration gradient?

19. Does facilitated diffusion take place via active or passive transport?

20. Name the main source of energy for active transport.

21. How do very large cells (proteins) enter the cell?

22. What is the difference between endocytosis and exocytosis? What do they each need from the cell in order to carry out their functions?

23. Cystic fibrosis is a genetic disorder that in which the movement of chloride ions through a cell membrane is disrupted.   Why would the result of this disruption be a disruption of water regulation?

24. Why would you suffocate when your lungs fill up with water?

25. Why are oils and waxes found on the human skin helpful?

26. What happens to plants when they don't receive enough water from their roots?

27. When high tides occur they often leave behind small areas of seawater which contain about 3% salt.   When the water evaporates there is a 2-3 fold increase in the salt concentration in these small areas. Some organisms can live in these waters such as brine shrimp. Lab experiments using brine shrimp have shown they survive in solutions which range from 0.5% to 25% salt and maintain a pretty constant concentration of salt in their body fluids no matter what the slat concentration in the water.

Based on this information answer the following questions using these responses:

    a. a restatement of the above information
    b. a logical hypothesis that might explain the observations and that could be tested
    c. an illogical hypothesis that does not explain the observations
    d. a statement that is unrelated to the above information

_____ Brine shrimp can live in water that has a different salt concentration than the salt concentration of their body fluids.
_____ In order to retain body water or pump out salt to maintain their body fluids at a consistent level, the brine shrimp constantly used energy.
_____ Brine shrimp has a salt concentration that remains stable.
_____ In terms of excretion the brine shrimp will excrete not only their own wastes but actively release any excess substances taken in from their environment.
_____ Brine shrimp lay a lot off eggs and most of them will never develop.
_____ It does not matter if ponds have salt concentrations higher than that of seawater, brine shrimp can live in the pond water.

28. You are stuck in a boat out at sea. Why would death occur if you drank only the seawater?