1.List the functions of the plasma (cell) membrane.

2.Describe the general molecular structure of the plasma (cell) membrane.

3.Draw a simple diagram of the molecular structure of the cell membrane.

4.Explain why phospholipid molecules form a bilayer.

5.Describe how the ends and central portions of membrane proteins that extend all the way through the membrane differ.

6.Describe the structure and function of each molecular component of the plasma membrane including the phospholipid bilayer, proteins, cholesterol and carbohydrates.

7.Explain why the plasma membrane is flexible and why that flexibility is beneficial.

- 8.Describe the functions and characteristics of a. membrane channels b. membrane carriers c. membrane receptor sites d. membrane-bound enzymes e. t-SNAREs f. cell adhesion molecules (CAMs) 9.List the three things that hold cells together. 10.Describe the extracellular matrix. 11.Describe, diagram, and explain the structure and function of a. tight junctions b. gap junctions 12.Define the three types of intercellular communication. 13.List the 4 categories of intercellular chemical messengers. Compare their characteristics, sites of action, and functions. 14.Define and describe the relationship between ligand and target cell. 15.Define signal transduction. 16.Describe what happens in general when an extracellular chemical messenger binds with a membrane receptor. 17.Define and describe the relationship between first and second messengers. 18.Define and compare leak and gated membrane channels. 19.Describe the three types of gated channel. 20.Describe how chemical messengers can alter channels. 21.By opening or closing channels, extracellular messengers regulate the flow of _____ across the cell membrane. 22.List the two events that can be caused by ionic movement across the cell membrane. 23.Describe the cAMP second messenger mechanism. Diagram the process. 24.List two other molecules that are common second messengers. 23.Define amplification and describe how it works in a second messenger mechanism. 24.Briefly describe modifications of second messenger mechanisms. 25.Briefly describe apoptosis and its roles. 26.Explain the difference between the terms "permeable" and "permeating". 27.Define these terms: a. permeable b. impermeable c. selectively permeable 28.Explain the factors that determine whether or not a molecule can permeate a membrane. 29.Name the two types of forces that can cause molecules to move across membranes. 30.Explain the physical basis for diffusion: a. why are all molecules moving randomly above absolute zero? b. what is the result of this movement? c. define concentration gradient d. how is this movement affected by a concentration gradient? 31.Explain the difference between "diffusion" and "net diffusion". Will net diffusion occur if there is no concentration gradient? 32.What kind of energy "powers" a) diffusion and facilitated diffusion b) active transport and vesicular transport 33.Discuss the 5 factors that affect the rate of diffusion across a membrane (see Fick's Law of Diffusion). 34.Explain how electrical gradients affect diffusion across membranes. 35.Define electrical gradient and electrochemical gradient. 36.Define osmosis. 37.Complete these statements about osmosis: a. water is moving

_____ its concentration gradient b. water is moving _____ the side of the membrane with the higher water concentration c. water is moving _____ the side of the membrane with the higher solute concentration d. the _____ is "pulling" water to its side of the membrane 38.Explain how you can determine the concentration of water if you are given the concentration of solute in a percent solution. 39.Compare osmosis involving a) penetrating and b) nonpenetrating solutes. 40.What is Sarah's definition of osmotic pressure? 41.Two solutions are separated by a membrane that is permeable to water but not to solutes. One solution is 10% solute and the other is 12% solute. Which solution has the higher osmotic pressure? Diagram this situation. 42.Define: a. tonicity b. isotonic c. hypotonic d. hypertonic 43.Explain and diagram what would happen to a red blood cell if you placed it into a a. solution with higher osmotic pressure b. solution with lower osmotic pressure 44.Describe the kind of molecules that require a. carrier-mediated transport b. vesicular transport (see page 78 under Assisted Membrane Transport and lecture notes) 45.Describe how carrier proteins work. 46.List and explain the characteristics of carrier proteins. 47.Name the two forms of carrier-mediated transport, name one example of each, and explain the differences between them. 48.Describe the facilitated diffusion of glucose. 49.Explain how the Na+/K+ active transport system (pump) works. Diagram the system. 50.Explain the difference between primary and secondary active transport. 51.Explain how secondary active transport mechanisms work. Diagram a secondary active transport mechanism. 52.Define endocytosis and exocytosis. 53.Explain the difference between phagocytosis and pinocytosis. 54.What happens to the vesicles formed by endocytosis? 55.Explain how vesicular transport works. Diagram the process. 56.Discuss the effect of vesicular transport on the cell membrane. 57.Describe the process of potocytosis. 58.Describe how caveolae are involved in cell-to-cell communication. 59.Define membrane potential. 60.Explain the purpose of separating electrical changes across a membrane. 61.Explain where, exactly, the membrane potential exists. 62.Describe the membrane potential of living cells and the ions that are primarily responsible for causing it. 63.Name the two mechanisms underlying the membrane potential. 64.Explain how the Na/K pump contributes to the membrane potential.