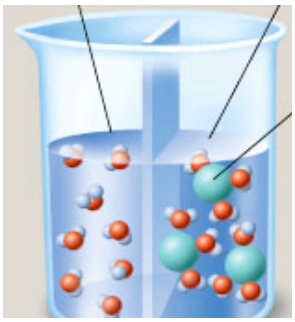
L100 Lecture quiz #1 **Answer Key**

1. What role do membrane proteins have in facilitated diffusion? Explain. (1 pt)

- **membrane proteins allow the passage of large or charged particles across the plasma membrane**
- **like opening a doorway for the molecules or ions to go through – going down their concentration gradient**
- **without these specific membrane proteins the molecules would not be able to diffuse across the membrane**

2. (a) Assume that small molecules are representing water molecules, which can pass through the membrane, and the large round molecules are representing Urea molecules, which can**not** pass through the membrane. Label the: **solvent, solute, hypotonic side & hypertonic side** (2 pts)

solvent



solute

Hypotonic side

Hypertonic side

(b) For the above diagram will the water move towards the right side, the left side or stay the same? (1pt)

water will move towards the right side (towards hypertonic solution)

3. Complete the following table: (3pts)
Choose one of the two options at the top of each column for each cell in that column.

	Requires energy: Yes OR NO	**Transport protein used?** Yes OR NO	**Direction of movement concentration levels:** high to low OR low to high
Active transport	YES	YES	Low to High
Simple diffusion	NO	NO	High to Low
Facilitate diffusion	NO	YES	High to Low

4. Carrier proteins are embedded into the plasma membrane. If the carrier protein is a "channel" protein that is always open, it means _____. (1pt)

a. **molecules, specific to that channel but not normally permeable, may pass through the channel down their concentration gradient**

b. molecules, ~~specific to that channel but not normally permeable~~, may pass through the channel UP their concentration gradient without an input of energy

c. less energy is needed to move the molecules specific to that channel down their concentration gradient

d. energy input is required to maintain the channel in an open position and that energy can be harvested to move molecules through the channel

5. The concentration of calcium in a cell is 0.3%. The concentration of calcium in the surrounding fluid is 0.1%. What is the process by which the cell could obtain more calcium? (1pt)

Active transport -- going up the concentration gradient.

6. In osmosis, water always moves toward the (~~**hypotonic**~~ / **hypertonic** / **isotonic**) solution: that is, toward the solution with the (**higher** / ~~**lower**~~) solute concentration. (1pt)