AP Water Potential Sample Questions

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Answer the following questions and justify your answers. Show your work and explain your answer.**

1. If a plant cell’s ΨP = 2 bars and its ΨS = -3.5 bars, what is the resulting Ψ?
2. The plant cell from question #1 is placed in a beaker of sugar water with ΨS = -4.0 bars. In which direction will the net flow of water be?
3. The original cell from question # 1 is placed in a beaker of sugar water with ΨS = -0.15 MPa (megapascals). We know that 1 MPa = 10 bars. In which direction will the net flow of water be?
4. The value for Ψ in root tissue was found to be -3.3 bars. If you place the root tissue in a 0.1 M solution of sucrose at 20°C in an open beaker, what is the Ψ of the solution, and in which direction would the net flow of water be?
5. NaCl dissociates into 2 particles in water: Na+ and Cl- . If the solution in question 4 contained 0.1 M NaCl instead of 0.1 M sucrose, what is the Ψ of the solution, and in which direction would the net flow of water be?
6. A plant cell with a Ψs of -7.5 bars keeps a constant volume when immersed in an open-beaker solution that has a Ψs of -4 bars. What is the cell’s ΨP?
7. At 20°C, a plant cell containing 0.6 M glucose is in equilibrium with its surrounding solution containing 0.5 M glucose in an open container. What is the cell’s ΨP?