Directions- Answer each question with a complete sentence. Each question is worth 5 points.

1. Define osmosis-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Define diffusion-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Draw a diagram of the cell membrane (phospholipid bilayer). Label the hydrophobic and hydrophilic parts of the cell membrane.
2. What is “selectively permeable”? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Why can we call a cell membrane selectively permeable?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. What is the main way that diffusion and facilitated diffusion differ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In the diagram to the right which structure is responsible for transporting molecules across the membrane that are too large to fit?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which types of transport require energy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which types of transport do NOT require energy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Fill in the following chart:

|  |  |  |  |
| --- | --- | --- | --- |
| Transportation Type | Movement of Particles(in terms of concentration gradients) | Energy Required? | Use of a Channel? |
| Osmosis | \_\_\_\_\_\_\_\_\_ concentration 🡪\_\_\_\_\_\_\_\_\_ concentration |  |  |
| Diffusion | \_\_\_\_\_\_\_\_\_ concentration 🡪\_\_\_\_\_\_\_\_\_ concentration |  |  |
| Facilitated Diffusion | \_\_\_\_\_\_\_\_\_ concentration 🡪\_\_\_\_\_\_\_\_\_ concentration |  |  |
| Active | \_\_\_\_\_\_\_\_\_ concentration 🡪\_\_\_\_\_\_\_\_\_ concentration |  |  |



1. Which substance will the membrane not be permeable to?
2. Describe the movement of each molecule.
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw a cell in a hypotonic, hypertonic, isotonic solution. Draw and label the cell, the solutes and the solution.

15

14

13

Hypertonic Hypotonic Isotonic

Directions (for the rest of the problems):

1. Determine the water content both inside and outside the cell.
2. Draw an **arrow** representing the direction the water would diffuse.
3. State whether the solution is hypertonic, hypotonic, or isotonic.

Example:

17

16

15% salt

8% salt

81% water

9% Oxygen

4% NaCl

79% water

Water content inside = \_\_\_81\_\_\_\_% Water content inside = \_\_\_\_\_\_\_\_\_% Water content inside = \_\_\_\_\_\_\_\_\_\_

Water content outside = \_\_\_79\_\_\_% Water content outside = \_\_\_\_\_\_\_\_% Water content outside = \_\_\_\_\_\_\_\_\_

Type of solution = Hypertonic Type of solution = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Type of solution = \_\_\_\_\_\_

What will happen to the cell? What will happen to the cell? What will happen to the cell?

\_\_It will shrivel\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20

19

18

91% water

85% water

77% water

8% Glucose

7% Potassium

9% CO2

Water content inside = \_\_\_\_\_\_\_\_\_\_ Water content inside = \_\_\_\_\_\_\_\_\_\_ Water content inside = \_\_\_\_\_\_\_\_\_\_

Water content outside = \_\_\_\_\_\_\_\_\_ Water content outside = \_\_\_\_\_\_\_\_\_ Water content outside = \_\_\_\_\_\_\_\_\_

Type of solution = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Type of solution = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Type of solution = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

What will happen to the cell? What will happen to the cell? What will happen to the cell?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_