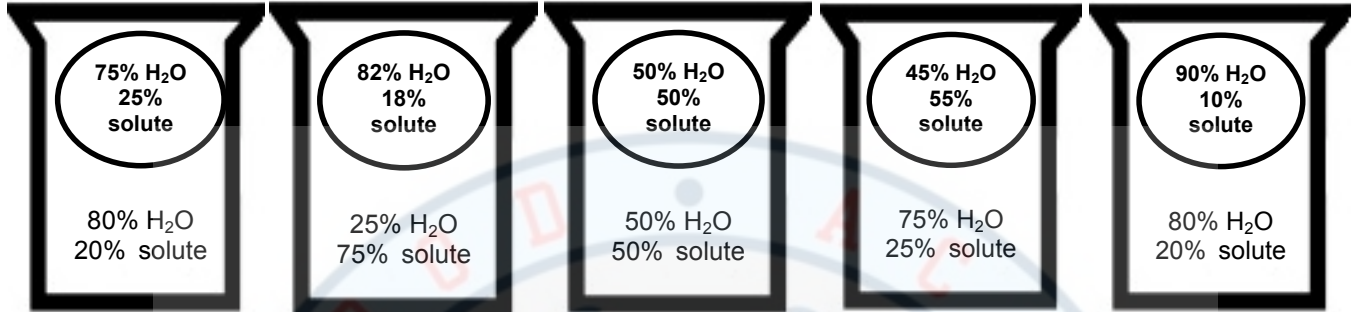


Name: _____ Date: _____ Period: _____

Cellular Transport Analysis Questions

Week # _____

Directions: Directions: Below are animal cells placed in beakers of various concentrations. Draw arrows to show which way the water would move by osmosis. Then identify the solutions as hypertonic, isotonic, or hypotonic compared to the cell.



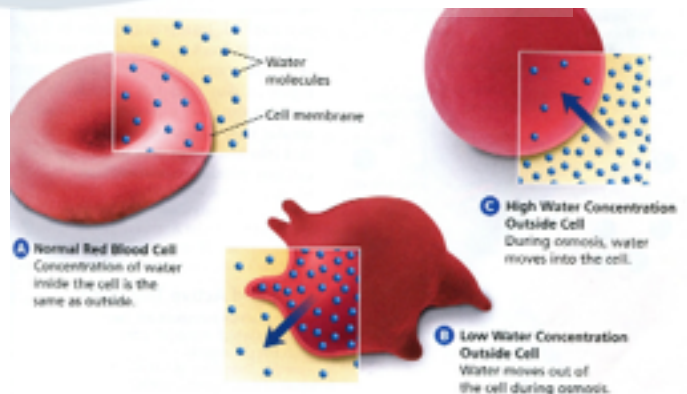
Directions: Complete each questions based on your knowledge of osmosis.

1. What would you expect to happen to the cells of a celery stick if you placed the celery in a hypertonic solution? Explain your answer.

2. What would you expect to observe if living oysters or clams were placed in an isotonic solution? Explain your answer.

3. Dishonest shellfish dealers actually place their oysters and clams in a hypotonic solution. What happens to the oysters and clams and why would they do this?

4. Examine the blood cells in the diagram. Identify the type of solution each blood cell was exposed to and explain your answer.



Osmosis in the ER

Directions: Read and annotate the passage. Then answer the questions below.

After his lunch break, Tom, an ER nurse, didn't have long to wait before the paramedics burst in through the swinging double-doors of the ambulance bay wheeling in a young man on a gurney. Edward, a veteran EMT, recited the vital signs to Tom and Dr. Greene as they helped push the gurney into the trauma room, "38-year-old male, gun shot wound to the right abdomen, heart rate 92, respiratory rate 22, blood pressure 95/65, no loss of consciousness." A gunshot wound! Tom knew that gunshot wounds were sometimes the most difficult traumas to handle.

Once inside the trauma room, Dr. Greene began his initial assessment of the patient while Tom got busy organizing the things he knew would be needed. He attached a pulse-oxygen monitor to the patient's index finger so Dr. Greene could keep an eye on the O₂ levels in the patient's blood and he inserted a catheter so the patient's urine output could be monitored.

After finishing his initial duties, Tom heard Dr. Greene saying, "It looks like the bullet missed the liver and kidney, but it may have severed an artery. That's probably why his BP is a bit low. Tom, grab a liter of saline and start a fast IV drip ... we need to increase his blood volume." Tom grabbed one of the fluid-filled bags from the nearby shelf, attached an IV needle to the plastic tubing, and gently slipped the needle into the patient's vein.

The reaction was quick and violent. The patient's heart rate began to skyrocket and Tom heard Dr. Greene shouting, "His O₂ saturation is falling! Pulse is quickening! What is going on with this guy?!" Tom stood frozen in place by the fear. He heard Dr. Greene continuing, "Flatline! We've lost a pulse ... Tom, get the crash cart, we need to shock this guy to get his heart going again!" Tom started CPR as Dr. Greene readied the cardiac defibrillator to shock the patient. They continued to alternate between CPR and defibrillation for almost an hour, but to no avail. As Dr. Greene announced the time of death, Tom felt a sickening feeling in the pit of his stomach.

Then Tom noticed that the fluid in the catheter bag was bright red. "Dr. Greene, there's hemoglobin in the bag," he said. "How could that be?" responded Dr. Greene. Tom began to trace back over his steps in the trauma, trying to think of anything that could have caused this. His mounting fear turned to outright terror as he looked at the now empty bag on the IV stand. Its label didn't read "Saline," but rather "Distilled Water." He looked at Dr. Greene, his heart quickly sinking, and said, "I think I may have killed the patient..."

1. What type of IV liquid did Tom think he was giving to the patient?
2. What type of IV liquid did Tom actually give to the patient?
3. What problem did the distilled water in the patient's bloodstream create?
4. What happened to the patient's blood cells as the distilled water was being administered?
5. Based on the patient's reaction, what type of solution was the distilled water?
6. What type of solution would the saline have been?