Osmosis Practice Problems

Good practice for test-taking strategy, too.
If you soak your hands in dishwater, you may notice that your skin absorbs water and swells into wrinkles. This is because your skin cells are _______________ to the ________________ dishwater.

A. Hypotonic...hypertonic
B. Hypertonic...hypotonic
C. Hypotonic...hypotonic
D. Isotonic...hypotonic
E. Hypertonic...isotonic
If you soak your hands in dishwater, you may notice that your skin absorbs water and swells into wrinkles. This is because your skin cells are _________________ to the _________________ dishwater.

A. Hypotonic...hypertonic
B. **Hypertonic...hypotonic**
C. Hypotonic...hypotonic
D. Isotonic...hypotonic
E. Hypertonic...isotonic
• You decide to buy a new fish for your freshwater aquarium. When you introduce the fish into its new tank, the fish swells up and dies. You later learn that it was a fish from the ocean.
#2

- Based on what you know of tonicity, the most likely explanation is that the unfortunate fish went from a(n) ___________________ solution into a(n) ___________________ solution.
  
  A. isotonic, hypotonic
  B. hypertonic, isotonic
  C. hypotonic, hypertonic
  D. hypotonic, isotonic
  E. isotonic, hypertonic
Based on what you know of tonicity, the most likely explanation is that the unfortunate fish went from a(n) _______________ solution into a(n) _______________ solution.

A. isotonic, hypotonic
B. hypertonic, isotonic
C. hypotonic, hypertonic
D. hypotonic, isotonic
E. isotonic, hypertonic
In osmosis, water always moves toward the _____ solution: that is, toward the solution with the _____ solute concentration.

A. isotonic, greater
B. hypertonic, greater
C. hypertonic, lesser
D. hypotonic, greater
E. hypotonic, lesser
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A. isotonic, greater
B. **hypertonic, greater**
C. hypertonic, lesser
D. hypotonic, greater
E. hypotonic, lesser
The concentration of solutes in a red blood cell is about 2%. Sucrose cannot pass through the membrane, but water and urea can. Osmosis would cause red blood cells to shrink the most when immersed in which of the following solutions?

A. a hypertonic sucrose solution
B. a hypotonic sucrose solution
C. a hypertonic urea solution
D. a hypotonic urea solution
E. pure water
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A. a hypertonic sucrose solution  
B. a hypotonic sucrose solution  
C. a hypertonic urea solution  
D. a hypotonic urea solution  
E. pure water
#5

- Sea water is dangerous to drink because
  - A. one cup of sea water contains enough sodium to poison you.
  - B. sea water is hypertonic to your body tissues and drinking it will cause you to lose water.
  - C. sea water is isotonic to your body fluids and you will absorb too much water.
  - D. the salt causes hypertension and you will promptly die of a stroke.
  - E. it contains toxic levels of iodine.
• Sea water is dangerous to drink because
  A. one cup of sea water contains enough sodium to poison you.
  B. **sea water is hypertonic to your body tissues and drinking it will cause you to lose water.**
  C. sea water is isotonic to your body fluids and you will absorb too much water.
  D. the salt causes hypertension and you will promptly die of a stroke.
  E. it contains toxic levels of iodine.
• If the volume of a cell increases when it is placed in a solution, that solution is said to be __________ to the cell.

A. hypertonic
B. subatomic
C. isotonic
D. gin and tonic
E. hypotonic
#6

• If the volume of a cell increases when it is placed in a solution, that solution is said to be _________ to the cell.

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B. subatomic
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E. hypotonic
• Inside one osmosis bag*, A, is a 50% glucose solution and inside bag B is a 20% glucose solution. Both bags are put into beakers containing 100% water.
  • *Osmosis bags are membranes that let water through but not glucose.

A. Bag A will gain weight.
B. Bag B will gain weight.
C. Both bags will gain weight.
D. Both bags will lose weight.
E. Both bags will remain the same.
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*Osmosis bags are membranes that let water through but not glucose.

A. Bag A will gain weight.
B. Bag B will gain weight.
C. **Both bags will gain weight.**
D. Both bags will lose weight.
E. Both bags will remain the same.
A 0.9% NaCl solution is isotonic to red blood cells. Which of these describes the results if red blood cells are placed into a 9% solution of NaCl?

A. They will burst.
B. They will shrink.
C. Nothing will happen.
D. They will expand but not burst.
E. None of the above.
#8

- A 0.9% NaCl solution is isotonic to red blood cells. Which of these describes the results if red blood cells are placed into a 9% solution of NaCl?

A. They will burst.
B. **They will shrink.**
C. Nothing will happen.
D. They will expand but not burst.
E. None of the above.
Wallway is a new general herbicide for aquatic plants. Its main ingredient is a marine salt solution. It is effective against freshwater but not saltwater plants. It works by breaking down the cell walls of the plants. The freshwater plants die because their cells

A. swell and cease to function.
B. shrink.
C. remain the same size but malfunction.
D. are crushed by the weight of the plant.
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A. swell and cease to function.
B. **shrink**.
C. remain the same size but malfunction.
D. are crushed by the weight of the plant.
A red blood cell has a salt concentration of 0.9%. What will happen if it is placed into a 1% salt solution? The red blood cell will

A. shrink if its membrane is permeable to both the salt and the water.
B. shrink if its membrane is impermeable to the salt and permeable to the water.
C. maintain its shape - nothing will happen.
D. swell and probably burst because its membrane is impermeable to salt and permeable to water.
E. swell and probably burst because its membrane is impermeable to water and permeable to salt.
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  A. shrink if its membrane is permeable to both the salt and the water.
  B. **shrink if its membrane is impermeable to the salt and permeable to the water.**
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  D. swell and probably burst because its membrane is impermeable to salt and permeable to water.
  E. swell and probably burst because its membrane is impermeable to water and permeable to salt.
#11

- Flasks X, Y, and Z contain solutions with different concentrations of the solute NaCl.
  - Flask X has 0.5% NaCl
  - Flask Y has 0.9% NaCl
  - Flask Z has 1.5% NaCl

- Red blood cells (0.9% NaCl) will be placed into each flask. Predict what will happen to the blood cells in each of the flasks.

A. **Flask X**: Contract  **Flask Y**: Unchanged  **Flask Z**: Swell

B. **Flask X**: Swell  **Flask Y**: Unchanged  **Flask Z**: Contract

C. **Flask X**: Unchanged  **Flask Y**: Swell  **Flask Z**: Contract

D. **Flask X**: Unchanged  **Flask Y**: Unchanged  **Flask Z**: Unchanged
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B. **Flask X:** Swell  **Flask Y:** Unchanged  **Flask Z:** Contract

C. **Flask X:** Unchanged  **Flask Y:** Swell  **Flask Z:** Contract

D. **Flask X:** Unchanged  **Flask Y:** Unchanged  **Flask Z:** Unchanged