

- 1. Why do water molecules form hydrogen bonds with solutes during solvation?**
  - A) Water is non-polar
  - B) Water is a polar molecule
  - C) Water has equal charge distribution
  - D) Water cannot dissolve polar substances
- 2. What part of the water molecule is attracted to negatively charged ions during solvation?**
  - A) Hydrogen atoms
  - B) Oxygen atoms
  - C) Both hydrogen and oxygen
  - D) Neither hydrogen nor oxygen
- 3. What happens when NaCl dissolves in water?**
  - A)  $\text{Na}^+$  ions are attracted to the hydrogen side of water
  - B)  $\text{Cl}^-$  ions are attracted to the oxygen side of water
  - C)  $\text{Na}^+$  ions are attracted to the oxygen side of water
  - D) Water molecules repel both  $\text{Na}^+$  and  $\text{Cl}^-$  ions
- 4. In osmosis, water moves from areas of \_\_\_\_\_.**
  - A) Higher solute concentration to lower solute concentration
  - B) Higher water concentration to lower water concentration
  - C) Lower solute concentration to higher solute concentration
  - D) Isotonic solutions to hypertonic solutions
- 5. What happens to plant cells in a hypertonic solution?**
  - A) They undergo lysis
  - B) They swell and become turgid
  - C) They experience plasmolysis
  - D) They remain unchanged
- 6. Which of the following best describes the effect of a hypotonic solution on animal cells?**
  - A) The cells undergo plasmolysis
  - B) The cells become turgid
  - C) The cells shrink and crenate
  - D) The cells swell and may burst (lysis)
- 7. What is the effect of placing plant tissue in a hypotonic solution?**
  - A) Plasmolysis
  - B) Increased turgor pressure
  - C) Shrinkage of the cell membrane
  - D) Crenation
- 8. What is the role of contractile vacuoles in freshwater unicellular organisms?**
  - A) They increase turgor pressure
  - B) They expel excess water to prevent lysis
  - C) They allow the cell to shrink in hypertonic environments
  - D) They aid in nutrient absorption

**9. In a hypertonic environment, what happens to animal cells that lack a cell wall?**

- A) They undergo plasmolysis
- B) They become turgid
- C) They shrink and experience crenation
- D) They swell and burst

**10. What is the primary medical application of isotonic solutions?**

- A) To prevent plasmolysis in plant cells
- B) To maintain fluid balance in blood plasma
- C) To increase water movement into cells
- D) To induce turgor pressure in animal cells

**11. How does water move in an isotonic solution?**

- A) Water moves only into the cell
- B) Water moves only out of the cell
- C) Water moves equally in both directions, with no net movement
- D) Water does not move at all

**12. Which of the following occurs when plant cells are placed in a hypertonic solution?**

- A) The cells swell and become turgid
- B) Water enters the cells, increasing pressure
- C) The cells shrink as water leaves, leading to plasmolysis
- D) The cells burst due to excessive water intake