

1. Assuming complete dissociation of all solutes, which of the following solutions would be hyperosmotic to 1 mM NaCl?

- A. 1 mM glucose
- B. 1.5 mM glucose
- C. 1 mM CaCl_2 *
- D. 1 mM sucrose
- E. 1 mM KCl

2. In error, a patient is infused with large volumes of a solution that causes lysis of his red blood cells (RBCs). The solution was most likely

- A. isotonic NaCl
- B. isotonic mannitol
- C. hypertonic mannitol
- D. hypotonic urea*
- E. hypertonic urea

3. Solutions A and B are separated by a membrane that is permeable to urea. Solution A is 10 mM urea, and solution B is 5 mM urea. If the concentration of urea in solution A is doubled, the flux of urea across the membrane will

- A. double
- B. triple*
- C. be unchanged
- D. decrease to one-half
- E. decrease to one-third

4. Inactivated state of potassium channels occurs when

- A. n gate and inactivation particle (chain and ball) both are closed
- B. n gate and inactivation particle (chain and ball) both are open
- C. n gate closed and inactivation particle (chain and ball) opened
- D. n gate open and inactivation particle (chain and ball) closed *
- E. n gate inactivation particle (chain and ball) are not related to potassium channel

5. One mole of CaCl_2 would supply _____ osm

- A. One
- B. Two
- C. Three*
- D. Four
- E. Five

6. Mole means:

First: A mole is the gram-molecular weight of substance

Second: A mole is the gram weight of substance

Third: The molecular weight of the substance in grams

Forth: The weight of the substance in grams times valance

The true answer will be:

- A. First and second
- B. Second and third
- C. Frist and third*
- D. Second and fourth
- E. First, second and third

7. Tonicity depends on

First: osmolarity

Second: nature of solute

Third: charge of solute

Fourth: molecular weight of solute

Fifth: permeability of membrane

The true answer will be:

A. First second and third

B. Second third and fourth

C. Third fourth and fifth

D. First second and fifth *

E. First second and fourth

F. Second fourth and fifth

8. The following have 6 trans-membrane domains and 1 P loop

First: Calcium-activated potassium channel

Second: Tandem domain potassium channel

Third: The two-pore-domain potassium channel

Fourth: Inward rectifying potassium channel

Fifth: Voltage gate potassium channel

The true answer will be:

A. First and second

B. First and third

C. First and fourth

D. First and fifth*

E. Second and fifth

F. Second and fourth

9. Solutions A and B are separated by a semipermeable membrane that is permeable to K⁺, but not to Cl⁻. Solution A is 100 mM KCl, and solution B is 1 mM KCl.

Which of the following statements about solution A and solution B is true?

A. K⁺ ions will diffuse from solution A to solution B until the [K⁺] of both solutions is 50.5 mM

B. K⁺ ions will diffuse from solution B to solution A until the [K⁺] of both solutions is 50.5 mM

C. KCl will diffuse from solution A to solution B until the [KCl] of both solutions is 50.5 mM

D. K⁺ will diffuse from solution A to solution B until a membrane potential develops with solution A negative with respect to solution B*

E. K⁺ will diffuse from solution A to solution B until a membrane potential develops with solution A positive with respect to solution B

10. What process is responsible for the change in membrane potential that occurs during depolarization?

A. Movement of Na⁺ into the cell*

B. Movement of Na⁺ out of the cell

C. Movement of K⁺ into the cell

D. Movement of K⁺ out of the cell

E. Activation of the Na⁺-K⁺ pump

F. Inhibition of the Na⁺-K⁺ pump