



Scientific team

**Q. Which statement regarding homeostasis is incorrect?**

- A. The term “homeostasis” describes the maintenance of nearly constant conditions in the body.**
- B. In most diseases, homeostatic mechanisms are no longer operating in the body .**
- C. The body’s compensatory mechanisms often lead to deviations from the normal range in some of the body’s functions.**
- D. Disease is generally considered to be a state of disrupted homeostasis.**
- E. The concept of homeostasis includes the concept**

**Q. Which statement about feedback control systems is incorrect?**

- A. Most control systems of the body act by negative feedback.**
- B. Positive feedback usually promotes stability in a system .**
- C. Generation of nerve actions potentials involves positive feedback.**
- D. Feed-forward control is important in regulating muscle activity.**
- E. A feedback gain of -3.0 can correct 3/4 of the initial error.**

**Q. The term “glycocalyx” refers to what?**

- A. The negatively charged carbohydrate chains that protrude into the cytosol from glycolipids and integral glycoproteins.**
- B. The layer of anions aligned on the cytosolic surface of the plasma membrane.**
- C. The large glycogen stores found in active skeletal muscles.**
- D. The pericellular matrix the body uses to distinguish between its own cells and transplanted tissues .**
- E. A mechanism of cell-cell attachment**



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**Q. Which of the following characteristics is shared by simple and facilitated diffusion of glucose?**

- A. Occurs down an electrochemical gradient .**
- B. Is saturable.**
- C. Requires metabolic energy.**
- D. Is inhibited by the presence of galactose.**
- E. Requires a Na<sup>+</sup> gradient.**

**Q. Which of the following substances or combinations of substances could be used to measure interstitial fluid volume?**

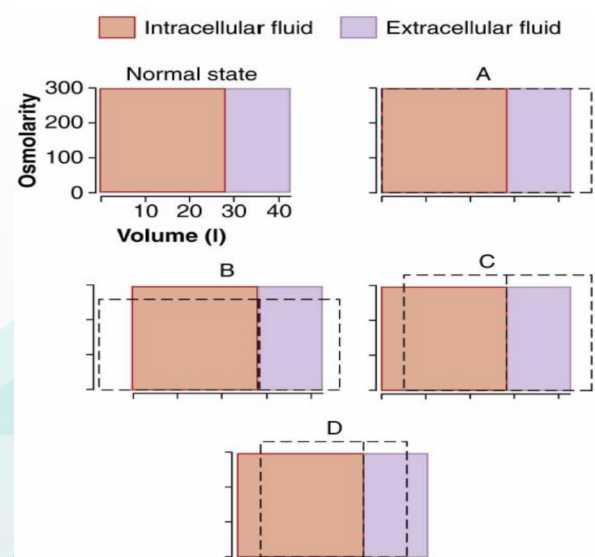
- A. Mannitol.**
- B. D<sub>2</sub>O alone.**

**Q. In a hospital error, a 60-year-old woman is infused with large volumes of a solution that causes swelling of her red blood cells (RBCs). The solution was most likely:**

- A. 150 mM NaCl.**
- B. 300 mM mannitol.**
- C. 350 mM mannitol.**
- D. 300 mM urea .**
- E. 150 mM CaCl<sub>2</sub>.**

**Q. Which diagram represents the changes (after osmotic equilibrium) in extracellular and intracellular fluid volume and osmolarity after the infusion of 1% dextrose?**

- A. Diagram A.**
- B. Diagram B .**
- C. Diagram C.**
- D. Diagram D.**
- E. No diagram is matching**





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**Q. Within the endocrine system, specificity of communication is determined by:**

- A. The chemical nature of the hormone**
- B. The distance between the endocrine cell and its target cell(s)**
- C. The presence of specific receptors on target cells**
- D. Anatomic connections between the endocrine and target cells**
- E. The affinity of binding between the hormone and its receptor**

**Q. Which of the following represents the basis for transduction**

**of a sensory stimulus into nerve impulses?**

- A. Change in the ion permeability of the receptor membrane**
- B. Generation of an action potential**
- C. Inactivation of a G-protein-mediated response**
- D. Protein synthesis**

**Q. Which one of the following statements concerning sensory neurons or their functional properties is true?**

- A. All sensory fibers are unmyelinated**
- B. In spatial summation , increasing signal strength is transmitted by using progressively greater numbers of sensory fibers**
- C. Increased stimulus intensity is signaled by a progressive decrease in the receptor potential**
- D. Continuous subthreshold stimulation of a pool of sensory neurons results in disfacilitation of those neurons**
- E. Temporal summation involves signaling of increased stimulus strength by decreasing the frequency of action potentials in the sensory fibers**



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**Q. In chemical synapses that involve a so-called second messenger, typically a G-protein linked to the postsynaptic receptor is activated when neurotransmitter binds to that receptor. Which of the following represents an activity performed by the activated second messenger?**

- A. Closure of a membrane channel for sodium or potassium**
- B. Activation of cyclic AMP or cyclic GMP**
- C. Inactivation of enzymes that initiate biochemical reactions in the postsynaptic neuron**
- D. Inactivation of gene transcription in the postsynaptic neuron**
- E. Opening of ligand-gated ion calcium channels**

**Q. A reflex arc includes:**

- A. At least two types of sensory receptors**
- B. At least two types of efferent neurons**
- C. At least one excitatory and one inhibitory neurons**
- D. At least two sets of sequential neurons**
- E. At least two sequential sets of central synapses**



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L1	B
L2	B
L3	D
L4	A
L5&	E
6	D
L7	B
L8	B
L16	C
L17	A
L18	B
L19	B
L20	D