

TEST BANK
Chapter 2
Control of the Internal Environment

Multiple Choice Questions

Level 1 questions-Lowest level of difficulty questions (correct response requires remembering key information)

1. The term homeostasis is defined as
 - A. a constant metabolic demand placed upon the body.
 - B. the maintenance of a constant internal environment.**
 - C. a low metabolic rate.
 - D. a change within the internal environment.

2. Physiologists use the term steady state to denote
 - A. a steady and unchanging level of a physiological variable.**
 - B. a completely normal external environment.
 - C. a changing internal environment.
 - D. an increase in body heat storage.

3. A series of interconnected components that serve to maintain a physical or chemical parameter of the body near a constant value is
 - A. homeostasis.
 - B. steady state.
 - C. a biological control system.**
 - D. an organ system.

4. The general components of a biological control system are the
 - A. receptor, control center, and response.
 - B. receptor, control center, and effector.**
 - C. effector, remote control, and stimulus.
 - D. receptor and integrating center.

5. Most control systems of the body operate via
 - A. positive feedback.
 - B. low-gain receptors.
 - C. negative feedback.**
 - D. feed forward mechanisms.

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6. The gain of a biological control system can be thought of as the
- A. precision with which the control system maintains homeostasis.
 - B. ratio of the amount of abnormality to the amount of correction needed to maintain a constant internal environment (i.e., amount abnormality/amount of correction needed).
 - C. positive feedback needed to maintain homeostasis.
 - D. stimulus that triggers the biological control system to bring the internal environment back to normal.
7. Exercise training can improve homeostatic control via
- A. an increase in positive feedback.
 - B. an increase in negative feedback.
 - C. a decrease in negative feedback.
 - D. cellular adaptation.
8. Cellular adaptation to environmental stress (i.e., hot environment) is called
- A. acclimation
 - B. adaptation
 - C. homeostatic conversion
 - D. accomodation.
9. A chemical messenger is released from one cell and stimulates nearby cells is an example of
- A. autocrine signaling.
 - B. endocrine signaling.
 - C. juxtacrine signaling.
 - D. paracrine signaling.
10. Endocrine signaling involves the release of _____ into the bloodstream.
- A. heat shock proteins
 - B. neurotransmitters
 - C. hormones
 - D. transcription factors
11. The formation of mRNA in the cell is called
- A. transcription.
 - B. translation.
 - C. transduction.
 - D. transfection.

12. Translation is the production of a protein from mRNA at the
- A. nucleus.
 - B. ribosome.**
 - C. mitochondria.
 - D. Golgi apparatus.
13. The factor that “turns on” genes to promote the production of mRNA is called a
- A. myonuclei
 - B. mRNA transducer
 - C. transcriptional activator**
 - D. DNA transcriber
14. Autocrine signaling occurs when a cell produces
- A. and releases a chemical messenger into the extracellular fluid that acts upon the cell that produced the messenger.**
 - B. a signal that acts upon nearby cells.
 - C. chemical signals are released into the blood and carried throughout the body.
 - D. a signal that acts with the cell that produced the signal.
15. The term cell signaling refers to
- A. depolarization of the cell.
 - B. hyperpolarization of the cell.
 - C. a system of communication between cells.**
 - D. None of the above answers are correct.

Level 2 questions-Moderate level of difficulty (correct response requires understanding and comprehending information)

16. Stress proteins (i.e., heat shock proteins) are manufactured by cells in response to exercise and other stresses. Importantly, increasing the cellular levels of heat shock proteins
- A. can lead to an increased production of free radicals.
 - B. can lead to further disruptions in homeostasis.
 - C. can lead to an increased degree of cellular injury.
 - D. can repair damaged cellular proteins and restore homeostasis.**

17. During 60 minutes of constant-load submaximal exercise, the body temperature reaches a plateau after 35-45 minutes. This is an example of

- A. homeostasis.
- B. effector.
- C. a steady state.
- D. changing internal environment.

18. In order to maintain blood glucose homeostasis, which of the following events would likely occur in response to a significant rise in blood glucose?

- A. decreased insulin secretion from the pancreas
- B. increased uptake of glucose by cells**
- C. release of blood glucose from the liver
- D. all of the above answers are correct

19. Which of the following physiological events is an example of positive feedback?

- A. regulation of blood glucose
- B. regulation of body temperature
- C. labor contractions during childbirth**
- D. the cellular stress protein response

20. In negative feedback, the response of the system is

- A. to increase the gain of the receptor.
- B. to modify the receptor's response to the stimulus.
- C. opposite to that of the stimulus.**
- D. to increase the stimulus.

Level 3 questions -Highest level of difficulty (correct response requires applying and analyzing information)

21. Some cells communicate by cell-to-cell contact. This type of signaling

- A. is called intracrine signaling and requires that the cytoplasm of one cell makes contact with the cytoplasm of another cell.
- B. is called juxtacrine signaling and requires that the cytoplasm of one cell makes contact with the cytoplasm of another cell.**
- C. is called autocrine signaling and requires that the cytoplasm of one cell makes contact.
- D. None of the above answers are correct

22. The most important control systems in the body are those systems that regulate a physiological variable that is required to sustain life. Which of the following control systems would likely have a large gain?

- A. cardiovascular control system
- B. pulmonary control system
- C. temperature control system
- D. All of the above answers are correct**

23. Negative feedback is an important class of biological control systems in the body that serves to restore normal values of a variable to maintain homeostasis. Which of the following examples illustrate a negative feedback control system of the body?

- A. regulation of CO₂ concentrations in the blood
- B. control of body temperature
- C. regulation of blood glucose
- D. All of the above answers are correct**

All true/false questions are rated as Level 1 questions-Lowest level of difficulty questions (correct response requires remembering key information)

True / False Questions

24. Because of complex control systems, the body always maintains homeostasis, even during prolonged or high intensity exercise.

FALSE

25. Failure of a biological control system can result in disease.

TRUE

26. Diabetes is a disease that results in high blood glucose levels (i.e., hyperglycemia).

TRUE

27. The endocrine system plays a key role in maintaining homeostasis in the body.

TRUE

28. The gain of a control system is the ability of a receptor to adapt to a repeated stimulus.

FALSE