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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. none of the above.

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

6. The gain of a biological control system can be thought of as the
- A. amount of amplification of the system or the 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. 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 enhance the stimulus.
8. 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. steady state.
 - D. changing internal environment.
9. The precision with which a control system maintains homeostasis is termed
- A. positive feedback.
 - B. negative feedback.
 - C. set point.
 - D. gain.
10. Stress proteins that are manufactured by cells in response to exercise
- 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 help to repair damage caused by free radicals.

11. Because of complex control systems, the body always maintains homeostasis, even during exercise.

- A. true
- B. false

12. Which of the following 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

13. Which of the following would occur in response to elevated blood glucose to maintain homeostasis?

- A. decreased insulin secretion from the pancreas
- B. increased uptake of glucose by cells
- C. continued elevation of blood glucose
- D. all of the above

14. The effectors in the response to increased body temperature include

- A. cutaneous blood vessels and sweat glands.
- B. cutaneous blood vessels and skeletal muscle.
- C. baroreceptors.
- D. stretch receptors.

2 Key

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.

Powers - Chapter 02 #1

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.

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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. none of the above.

Powers - Chapter 02 #3

4. The general components of a biological control system are the

- A. receptor, integrating center, and response.
- B.** receptor, integrating center, and effector.
- C. effector, control box, and stimulus.
- D. receptor and integrating center.

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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. amount of amplification of the system or the 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.

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7. 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 enhance the stimulus.

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8. 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. steady state.**
- D. changing internal environment.

Powers - Chapter 02 #8

9. The precision with which a control system maintains homeostasis is termed

- A. positive feedback.
- B. negative feedback.
- C. set point.
- D.** gain.

Powers - Chapter 02 #9

10. Stress proteins that are manufactured by cells in response to exercise

- 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 help to repair damage caused by free radicals.

Powers - Chapter 02 #10

11. Because of complex control systems, the body always maintains homeostasis, even during exercise.

- A. true
- B.** false

Powers - Chapter 02 #11

12. Which of the following 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

Powers - Chapter 02 #12

13. Which of the following would occur in response to elevated blood glucose to maintain homeostasis?

- A. decreased insulin secretion from the pancreas
- B.** increased uptake of glucose by cells
- C. continued elevation of blood glucose
- D. all of the above

Powers - Chapter 02 #13

14. The effectors in the response to increased body temperature include

- A.** cutaneous blood vessels and sweat glands.
- B. cutaneous blood vessels and skeletal muscle.
- C. baroreceptors.
- D. stretch receptors.

2 Summary

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