MULTIPLE CHOICE

1. Which of the following statements about homeostasis is incorrect?
    a. It refers to the maintenance of a stable internal environment for the body.
    b. Homeostatic mechanisms do not operate in diseases.
    c. Homeostasis requires integrated actions of the cells, tissues, organs, and multiple nervous, hormonal, and local control systems.
    d. Homeostatic compensations that begin after a major environmental challenge may contribute to abnormalities of body function.

    ANS: B

2. What is the most abundant type of cell in the human body?
    a. Neuron
    b. Epithelial cell
    c. Red blood cell
    d. White blood cell
    e. Vascular smooth muscle cell
    f. Skeletal muscle cell

    ANS: C

3. The most abundant substance in the human body and the approximate percentage of that substance in the body is which of the following?
    a. Protein, 30%
    b. Protein, 60%
    c. Water, 30%
    d. Water, 60%
    e. Carbohydrate, 30%
    f. Carbohydrate, 60%

    ANS: D

4. If the feedback gain of a control system is − 2.0, this means that the system is
    a. a negative feedback system capable of correcting 1/2 of the initial disturbance to the system.
    b. a negative feedback system capable of correcting 2/3 of the initial disturbance to the system.
    c. a negative feedback system capable of correcting 3/4 of the initial disturbance to the system.
    d. a positive feedback system capable of correcting 1/2 of the initial disturbance to the system.
    e. a positive feedback system capable of correcting 2/3 of the initial disturbance to the system.
    f. a positive feedback system capable of correcting 3/4 of the initial disturbance to the system.

ANS: B

5. Which of the following substances has the highest extracellular fluid to intracellular fluid concentration ratio for most mammalian cells?
    a. Sodium ions
    b. Potassium ions
    c. Carbon dioxide
    d. Glucose
    e. Protein

    ANS: A

6. Exchange of substances between the cardiovascular system and the interstitial fluid occurs mainly in which of the following?
    a. Arteries
    b. Arterioles
    c. Capillaries
    d. Venules
    e. Veins

    ANS: C

7. What is the approximate distance from the capillaries to most cells of the body?
    a. Less than 50 angstroms
    b. Less than 50 microns
    c. Less than 50 millimeters
    d. Less than 100 angstroms
    e. Less than 100 microns
    f. Less than 100 millimeters

    ANS: A

8. When a person is at rest, how much time is required for the blood in the circulation to traverse the entire circulatory circuit?
    a. 1 second
    b. 1 minute
    c. 3 minutes
    d. 4 minutes
    e. 5 minutes

    ANS: B

9. The type of control system that can sometimes cause instability and vicious cycles is called
    a. negative feedback.
    b. feed-forward control.
    c. positive feedback.
    d. adaptive feedback.
    e. delayed negative feedback.

    ANS: C

10. Which of the following is an example of positive feedback in the body?

a. Return of blood pressure toward normal after a hemorrhage
b. Generation of action potentials in nerves
c. Increased respiration rate caused by accumulation of carbon dioxide in the blood
d. Decreased sympathetic nervous system activity that occurs in response to increased blood pressure

ANS: B

11. Which of the following is an example of a "feed-forward" control system?
    a. The arterial baroreceptor system
    b. The progressive nature of uterine contractions during childbirth
    c. Control of skeletal muscle movements by the brain
    d. Generation of an action potential

    ANS: C

12. Which of the following is an example of negative feedback?
    Example 1: Arterial baroreceptor control of blood pressure
    Example 2: Excitation of the respiratory center by increased blood carbon dioxide concentration
    Example 3: Hemorrhagic shock caused by severe blood loss
    a. Example 1 only
    b. Example 2 only
    c. Example 3 only
    d. Examples 1 and 2, but not 3
    e. Examples 1, 2, and 3

    ANS: D