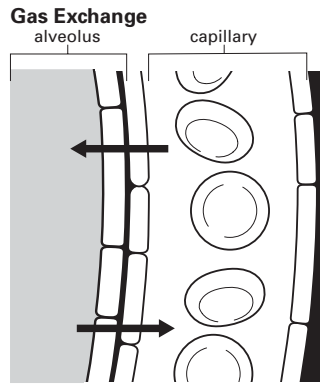


Benchmark Test 7

Choose the letter of the best answer.

1



In the diagram, the arrows represent the movement of gas molecules in the body during respiration. The blood cells at the top of the diagram are releasing gas into the alveolus of the lung. The blood cells at the bottom of the diagram are absorbing a different gas from the lung. The gas molecules represented by the arrow that points to the left

- A regulate the uptake of glucose by cells.
- B undergo cellular respiration.
- C are a waste product given off during exhalation.
- D serve as a source of energy when glycogen is low.

2 One way the body maintains homeostasis is by regulating the concentration of glucose in the blood. When the blood glucose concentration decreases, how does the body restore the concentration to its set point?

- A by removing glucose from the blood
- B by releasing glucose from storage molecules
- C by undergoing cellular respiration
- D by converting carbon into oxygen

3 The kidneys are organs of the excretory system that remove liquid waste from the body. Which of the following best describes how the kidneys help maintain homeostasis?

- A They produce ammonia.
- B They store urine.
- C They break down proteins.
- D They regulate fluid levels.

4 A reflex arc is an involuntary response. It occurs when the nervous system senses a stimulus and produces a response without sending a signal to the brain. Which of the following is the best example of a reflex arc?

- A jumping over a hurdle
- B reading the words on this page
- C closing your eyes at the scary part in a movie
- D blinking when a ball flies toward you

5 Which is true of both the nervous and endocrine systems?

- A They stimulate other body systems to produce a change.
- B They act independently of other body systems.
- C They regulate all the body's voluntary responses.
- D They control the activities of the brain.

6 The hypothalamus is the part of the nervous system that takes in and sorts all of the incoming messages to the brain. The hypothalamus is also a part of the endocrine system that releases hormones that stimulate other glands of the endocrine system. Which of the following *best* summarizes the role of the hypothalamus?

- A** The hypothalamus releases hormones.
- B** The hypothalamus produces reflex arcs.
- C** The hypothalamus connects the two body systems.
- D** The hypothalamus stimulates the pituitary.

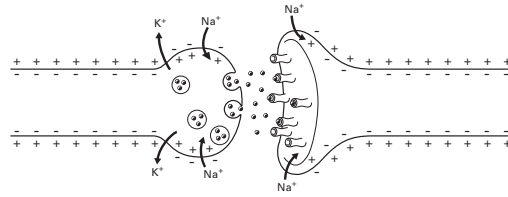
7 Negative feedback loops allow the body to maintain homeostasis as internal conditions change or move away from a set point. Which of the following is the *best* example of negative feedback in the body?

- A** increasing cells' activity to warm the body when it is cold
- B** keeping large amounts of carbon available in the blood
- C** stimulating muscle contractions to move the arm
- D** releasing chemicals that will thin the blood

8 If your blood has too little calcium, the nervous system will sense the change and stimulate the endocrine system. The endocrine system will stimulate the skeletal system to release some of the calcium that is stored in bones into the bloodstream. In this example the nervous and endocrine systems allow for

- A** transport.
- B** homeostasis.
- C** feedback.
- D** communication.

9



The diagram shows the transmission of a nerve impulse. Which statement *best* describes what is taking place?

- A** The impulse is moving from left to right.
- B** The impulse could be moving in either direction.
- C** Resting potential exceeds action potential.
- D** There is no action potential.

10 Which of the following describes what happens as a nerve impulse travels through a neuron?

- A** An action potential moves in the opposite direction.
- B** An action potential moves from the axon to the dendrite.
- C** An action potential moves as ions cross the cell membrane.
- D** An action potential results in sodium being evenly spaced.

11 When an action potential is traveling through a neuron, it is an electrical impulse. How does the action potential move from one neuron to the next?

- A** by releasing an electrical impulse into the synapse
- B** by releasing potassium into the synapse
- C** by releasing neurotransmitters into the synapse
- D** by releasing sodium into the synapse

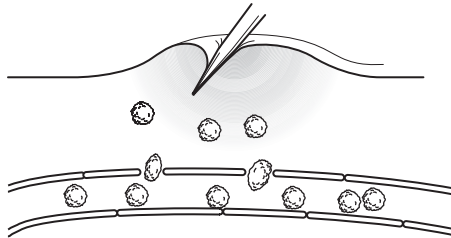
12 Which sequence represents the pathway of a reflex arc?

- A** sensory neuron → spinal cord → brain → motor neuron
- B** sensory neuron → spinal cord → motor neuron
- C** sensory neuron → motor neuron
- D** motor neuron → spinal cord → sensory neuron

13 Suppose you want to pick up your pencil so that you can take a quiz. Which type of neuron allows you to move the muscles in your hand so that you can physically pick up the pencil?

- A** central neurons
- B** interneurons
- C** sensory neurons
- D** motor neurons

14



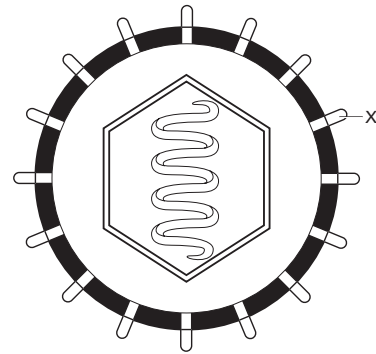
When the skin is punctured or broken, inflammation, or swelling, occurs at the site of the damaged tissue. Which of the following *best* describes this inflammation response shown in this diagram?

- A** It involves production of antibodies.
- B** It is the same no matter what kind of pathogen is involved.
- C** It causes memory cells to develop as the skin heals.
- D** It prevents pathogens from crossing the skin barrier.

15 Suppose you scrape your knee while rollerblading, and your friend recommends that you wash off your knee immediately. This is good advice because washing your knee will help you

- A** keep it clean.
- B** continue rollerblading.
- C** prevent infection.
- D** repair your skin.

16



The diagram shows a virus that can cause disease when it infects the body. Along the perimeter of the virus are structures labeled X. These structures are antigens, and they are the part of the virus that your immune system will identify before launching an attack. Which of the following is also true about antigens?

- A** They are the structures that antibodies attach to.
- B** They are the structures that antibiotics identify.
- C** They are the structures that are only found on viruses.
- D** They are the structures that allow viruses to move.

17 When you get the flu, you will probably recover after a few days. Which statement *best* explains how you can recover from a disease, such as the one caused by the flu virus?

- A** The flu viruses die off naturally as their food supply diminishes.
- B** Fever kills the viruses before they reproduce.
- C** As viruses mutate, they can no longer reproduce.
- D** Your immune system generates antibodies against the virus.

18 Which of the following terms *best* describes a substance that cells of the immune system produce to fight infections?

- A** antibiotic
- B** antiseptic
- C** antibody
- D** antigen

19 Vaccines are substances that contain pieces of a disease-causing particle. The vaccine stimulates the immune system to produce memory cells. Which statement *best* describes the main benefit of vaccines?

- A** They reduce the fever associated with an infection.
- B** They prevent disease caused by future infections.
- C** They may contain pathogen antibodies.
- D** They are useful for curing infections.

20 In order for a vaccine to be effective, it must be given before an infection takes place. This is because vaccines

- A** can be destroyed by the infection and then they will be ineffective.
- B** stimulate the immune system to produce memory cells and not to fight the actual infection.
- C** take control of the immune system by building their own antibodies.
- D** need time to mature into antibodies that can affectively fight an infection.

21 Antibiotics are substances that weaken cell walls so that when a cell tries to divide, its cell wall breaks, and the cell bursts. Which statement *best* explains why viruses are not affected by antibiotics?

- A** Viruses have developed resistance to antibiotics.
- B** Viruses need a living host to reproduce.
- C** Viruses have a protein coat and not a cell wall.
- D** The body does not recognize viral antigens.

22 Suppose you discover a microscopic particle, and you perform experiments to determine if it is a virus or bacteria. In the first experiment, you put several of the same particle in a nutrient solution, and you find that the particles do not reproduce. In the second experiment, you put several of the particles in a nutrient solution with a specific type of bacterium, and you find that the particles do reproduce. Which of the following statements is the *best* conclusion you can draw from these experiments?

- A** The particle is a bacterium because it needs nutrients and other life to grow and reproduce.
- B** The particle might be a bacterium or a virus because the two groups are not distinguished by how they reproduce.
- C** The particle is a body cell because it cannot reproduce without the presence of other specialized cells.
- D** The particle is a virus because viruses cannot reproduce on their own and they must reproduce inside a living host.

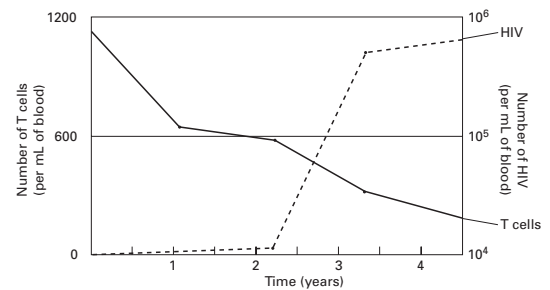
23 HIV is a virus that attacks cells of the immune system. Which of the following statements is true?

- A** HIV weakens the immune system by destroying cells that fight infection.
- B** HIV weakens the immune system by preventing cells that fight infection from replicating.
- C** HIV weakens the immune system by causing immune cells to become exhausted.
- D** HIV weakens the immune system by distracting the immune system from other infections.

24 People who have HIV infections will eventually get other infections that their bodies cannot fight off. Which of the following *best* describes how HIV allows for other illnesses?

- A** HIV mutates and can cause other diseases.
- B** HIV destroys the cells that would fight other infections.
- C** HIV stimulates other disease-causing particles to reproduce.
- D** HIV passes on its antibiotic resistance to other particles.

25



T cells are key cells of the immune system that help the body recognize and remember pathogens. The graph shows what happens over time to the T cells of a person infected with HIV. Which conclusion applies to this graph?

- A** HIV boosts the number of T cells in the body.
- B** After several years, HIV levels begin to drop.
- C** HIV destroys significant numbers of T cells.
- D** T cells are unaffected by the presence of HIV in the blood.