Test of Essential Academic Skills (TEAS) Science Practice Test (Sample)

Study Guide

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Questions

1. Which system includes organs between the mouth and anus?

A. Respiratory

B. Digestive

C. Endocrine

D. Skeletal

2. What is one of the key characteristics of diseases like emphysema?

A. Decreased lung capacity

B. Increased lung elasticity

C. High infection rates

D. Improved respiratory function

3. What role do white blood cells play in the lymphatic system?

A. Transporting oxygen

B. Protecting the body from environmental pathogens

C. Regulating body temperature

D. Breaking down food

4. What is the primary function of the skeletal system?

A. Provide immunity to infections

B. Facilitate digestion and nutrient absorption

C. Support and protect the body

D. Regulate body temperature

5. Which by-product of cellular respiration is used by autotrophs to produce glucose?

A. ATP

B. Carbon dioxide

C. Chlorophyll

D. Oxygen

6. In a study examining the effects of extracurricular involvement on college entrance exam scores, what type of variable is extracurricular involvement?

A. Dependent

B. Independent

C. Extraneous

D. Qualitative

7. What does chronic exposure to tar in cigarettes primarily cause?

A. Improved lung function

B. Cellular mutations

C. Greater lung capacity

D. Reduced inflammation

8. After the right ventricle contracts, where does blood flow next?

A. To the left atrium

B. To the pulmonary artery

C. To the left ventricle

D. To the aorta

9. What is the kinetic energy of a 2-kilogram mass traveling at 3 meters/second?

A. 3 joules

B. 6 joules

C. 9 joules

D. 18 joules

10. Meiosis occurs in which of the following cells?

A. Germ cells

B. Skin cells

C. Blood cells

D. Brain cells

Answers

1. B
2. A
3. B
4. C
5. B
6. B
7. B
8. B
9. C
10. A

Explanations

1. Which system includes organs between the mouth and anus?

A. Respiratory

B. Digestive

C. Endocrine

D. Skeletal

The digestive system is the correct answer as it comprises a series of organs that work together to process food, beginning at the mouth and continuing all the way to the anus. This system includes not only the mouth but also the esophagus, stomach, small intestine, large intestine, and the anus. Its primary function is to break down food into nutrients that the body can absorb and utilize for energy, growth, and cell repair, while also eliminating waste. Each of the other systems mentioned has different roles within the body. The respiratory system is responsible for gas exchange, primarily involving the lungs and airways, and does not include structures related to the intake or processing of food. The endocrine system is composed of glands that secrete hormones into the bloodstream to regulate various body functions, lacking any direct involvement with the digestive pathway. The skeletal system provides structural support and protection for the body and does not include organs associated with digestion. Thus, only the digestive system encompasses the full pathway from mouth to anus.

2. What is one of the key characteristics of diseases like emphysema?

A. Decreased lung capacity

B. Increased lung elasticity

C. High infection rates

D. Improved respiratory function

One of the key characteristics of diseases like emphysema is decreased lung capacity. Emphysema is a chronic respiratory condition that primarily affects the alveoli, which are the tiny air sacs in the lungs where gas exchange occurs. In emphysema, the walls of the alveoli become damaged and lose their elasticity, leading to an expansion of the air spaces in the lungs. As a result, the surface area for gas exchange is significantly reduced, which impairs the ability to breathe effectively and results in decreased lung capacity. As the disease progresses, individuals may find it increasingly difficult to fully exhale air from the lungs, leading to air trapping and further reduction in functional lung capacity. This is an essential characteristic of emphysema and distinguishes it from conditions associated with increased lung elasticity or improved respiratory function. Other options, such as high infection rates, can occur in some respiratory conditions; however, they are not defining features of emphysema itself.

3. What role do white blood cells play in the lymphatic system?

A. Transporting oxygen

B. Protecting the body from environmental pathogens

C. Regulating body temperature

D. Breaking down food

White blood cells, or leukocytes, are crucial for the immune response and play a key role in the lymphatic system by protecting the body from environmental pathogens. They are part of the body's defense mechanism, identifying and attacking harmful organisms, such as bacteria, viruses, and other foreign invaders that can cause disease. The lymphatic system serves as a transport system for these cells, allowing them to move throughout the body to areas where they are needed most, especially during infections or inflammation. In contrast, transporting oxygen is primarily the role of red blood cells, which carry oxygen from the lungs to the body's tissues. Regulating body temperature involves mechanisms such as sweating and blood flow adjustment, primarily managed by the circulatory system and the nervous system. The breakdown of food is an essential function of the digestive system, where nutrients are extracted from food and distributed to the bloodstream, rather than being related to the functions of the lymphatic system.

4. What is the primary function of the skeletal system?

A. Provide immunity to infections

B. Facilitate digestion and nutrient absorption

C. Support and protect the body

D. Regulate body temperature

The primary function of the skeletal system is to support and protect the body. The skeletal system is composed of bones, cartilage, and ligaments that create a framework for the body, facilitating overall structure and shape. It provides support for soft tissues and organs, ensuring they maintain their proper position and function within the body. Additionally, the bones act as a protective barrier for vital organs, such as the skull protecting the brain and the rib cage safeguarding the heart and lungs. This support and protective role is critical for maintaining homeostasis and allowing for movement when muscles contract against the skeletal framework. The skeletal system also plays a role in producing blood cells and storing minerals, which are important functions but secondary to its primary role in support and protection. The other options, while important body functions, do not relate directly to the primary purpose of the skeletal system. Therefore, the correct answer emphasizes the fundamental role of the skeletal system in maintaining the structure and integrity of the body.

5. Which by-product of cellular respiration is used by autotrophs to produce glucose?

A. ATP

B. Carbon dioxide

C. Chlorophyll

D. Oxygen

The by-product of cellular respiration that is used by autotrophs to produce glucose is carbon dioxide. During cellular respiration, organisms break down glucose to produce energy in the form of ATP, and carbon dioxide is released as a waste product. Autotrophs, such as plants, utilize this carbon dioxide during the process of photosynthesis. In photosynthesis, carbon dioxide is combined with water in the presence of sunlight to synthesize glucose and oxygen. This cycle highlights the interdependence of autotrophs and heterotrophs in ecosystems, where the carbon dioxide produced by one group becomes an essential resource for the other. In contrast, the other options play different roles: ATP is the energy currency produced during respiration but is not a by-product used in glucose production. Chlorophyll is a pigment in plants necessary for photosynthesis but does not derive from cellular respiration processes. Oxygen, while produced as a by-product of photosynthesis, is not utilized by autotrophs for glucose synthesis.

6. In a study examining the effects of extracurricular involvement on college entrance exam scores, what type of variable is extracurricular involvement?

A. Dependent

B. Independent

C. Extraneous

D. Qualitative

Extracurricular involvement is considered an independent variable in this context because it is the factor that is being manipulated or categorized to observe its effect on another variable, which in this case is college entrance exam scores. The primary purpose of identifying independent variables is to establish a cause-and-effect relationship; researchers want to see how changes in extracurricular involvement might influence test scores. By manipulating or varying levels of extracurricular involvement, researchers can examine the corresponding changes in the dependent variable (the college entrance exam scores). Therefore, as the independent variable, extracurricular involvement serves as the presumed cause that could lead to differences in outcomes measured in the study, specifically the performance on college entrance exams. Understanding independent variables is vital in scientific research as they help to determine the potential impacts on the outcomes being measured.

7. What does chronic exposure to tar in cigarettes primarily cause?

A. Improved lung function

B. Cellular mutations

C. Greater lung capacity

D. Reduced inflammation

Chronic exposure to tar in cigarettes primarily causes cellular mutations. Tar, a byproduct of burning tobacco, contains numerous carcinogenic (cancer-causing) chemicals that can lead to changes in the DNA within cells. Over time, these mutations can accumulate, increasing the risk of developing various forms of cancer, particularly lung cancer. Tar's toxic components affect cellular structure and function, disrupting normal cellular processes and potentially leading to uncontrolled cell growth. This process is central to the development of cancerous tumors, as the normal signaling pathways that regulate cell division and apoptosis (programmed cell death) can be altered by these mutations. Therefore, the relationship between tar exposure and cellular mutations is a critical concern in understanding the health risks associated with smoking.

8. After the right ventricle contracts, where does blood flow next?

A. To the left atrium

B. To the pulmonary artery

C. To the left ventricle

D. To the aorta

After the right ventricle contracts, blood flows into the pulmonary artery. This is a crucial part of the circulatory process, as the right ventricle's contraction pumps deoxygenated blood into the pulmonary artery, which then carries the blood to the lungs for oxygenation. In the lungs, carbon dioxide is exchanged for oxygen, which is essential for maintaining the body's oxygen levels. Once the blood is oxygen-rich, it will be returned to the heart, specifically to the left atrium, from where it proceeds to the left ventricle and then to the aorta for systemic circulation. This sequence is vital for ensuring that oxygenated blood reaches the tissues throughout the body while carbon dioxide is expelled during respiration.

9. What is the kinetic energy of a 2-kilogram mass traveling at 3 meters/second?

A. 3 joules

B. 6 joules

C. 9 joules

D. 18 joules

To determine the kinetic energy of an object, we use the formula for kinetic energy, which is expressed as: $$ KE = \frac{1}{2} m v^2 $$ where $ KE $ represents kinetic energy, $ m $ is the mass of the object (in kilograms), and $ v $ is the velocity of the object (in meters per second). In this case, the mass $ m $ is given as 2 kilograms, and the velocity $ v $ is 3 meters/second. Plugging in these values into the formula gives: $$ KE = \frac{1}{2} \times 2 \, \text{kg} \times (3 \, \text{m/s})^2 $$ $$ KE = \frac{1}{2} \times 2 \, \text{kg} \times 9 \, \text{m}^2/\text{s}^2 $$ $$ KE = \frac{1}{2} \times 18 \, \text{kg m}^2/\text{s}^2 $$ $$ KE = 9 \, \text{joules} $$ Therefore, the kinetic energy

10. Meiosis occurs in which of the following cells?

A. Germ cells

B. Skin cells

C. Blood cells

D. Brain cells

Meiosis is a specialized type of cell division that occurs in germ cells, which are the reproductive cells involved in sexual reproduction. This process results in the formation of gametes—sperm and eggs in humans and many other organisms. During meiosis, a single germ cell undergoes two rounds of division, ultimately producing four genetically diverse haploid cells, each containing half the original number of chromosomes. This reduction is critical for maintaining the species' chromosome count when fertilization occurs, allowing for genetic variation essential for evolution and adaptation. In contrast, skin cells, blood cells, and brain cells do not undergo meiosis. Instead, these cells replicate through mitosis, a process that results in two identical daughter cells for growth and tissue repair. This distinction between the types of cell division is crucial for understanding cellular function and the reproductive process in living organisms.