

CCE Science and Humanity Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

Copyright © 2025 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain from reliable sources accurate, complete, and timely information about this product.

SAMPLE

Questions

- 1. What role does the Center for Disease Control (CDC) play in science?**
 - A. It acts as a regulatory body that limits scientific inquiry**
 - B. It serves as an authoritative group providing guidance and information in health-related science**
 - C. It solely focuses on political influences in science**
 - D. It is primarily known for its creation of new scientific theories**
- 2. What are the primary functions of the skeletal system?**
 - A. To produce hormones and regulate metabolism**
 - B. To provide support, protect internal organs, and allow for movement**
 - C. To assist in digestion and nutrient absorption**
 - D. To facilitate respiration and gas exchange**
- 3. What is the process of homeostasis?**
 - A. The method by which cells divide to create new cells**
 - B. The process by which organisms regulate their internal environment**
 - C. The mechanism by which organisms evolve and adapt**
 - D. The method of energy transfer within ecosystems**
- 4. What is the composition of acid rain?**
 - A. High amounts of calcium carbonate**
 - B. Higher amounts of sulfuric and nitric acids**
 - C. Excessive oxygen and nitrogen**
 - D. Contaminated with heavy metals**
- 5. According to the philosopher Thomas Kuhn, how does science progress?**
 - A. Steady and gradual evolution**
 - B. Through a series of revolutions**
 - C. As a continuation of past theories**
 - D. By accumulation of data over time**

- 6. What is entropy a measure of in a system?**
- A. Energy conservation**
 - B. Order and structure**
 - C. Disorder and randomness**
 - D. Temperature and pressure**
- 7. What is one of the main waste products released during cellular respiration?**
- A. Oxygen**
 - B. Carbon dioxide**
 - C. Nitrogen**
 - D. Glucose**
- 8. What is a mutation?**
- A. A harmful environmental change**
 - B. A change in the DNA sequence**
 - C. A process of natural selection**
 - D. A type of cellular respiration**
- 9. What is Richard Dawkins known for in the scientific community?**
- A. Promoting the integration of science and spirituality**
 - B. Being a notable scientist who holds atheistic views**
 - C. Researching the intersections of faith and science**
 - D. Advocating for governmental oversight in scientific research**
- 10. What are amino acids?**
- A. The basic building blocks of proteins**
 - B. Natural substances that regulate metabolic processes**
 - C. Fatty compounds that store energy**
 - D. Minerals that support bone health**

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. What role does the Center for Disease Control (CDC) play in science?

- A. It acts as a regulatory body that limits scientific inquiry**
- B. It serves as an authoritative group providing guidance and information in health-related science**
- C. It solely focuses on political influences in science**
- D. It is primarily known for its creation of new scientific theories**

The Center for Disease Control (CDC) plays an essential role in public health by serving as an authoritative group that provides guidance and information related to health-related science. This function is crucial for informing policy, implementing health initiatives, and educating both the public and healthcare professionals about disease prevention, control, and safety measures. The CDC conducts research and collects data on various health concerns, allowing them to issue recommendations that are based on empirical evidence and scientific research. This guidance is integral in responding to health crises, developing public health campaigns, and establishing effective health policies. By synthesizing scientific knowledge and disseminating it widely, the CDC helps shape health practices and can influence health outcomes at both community and national levels. Thus, its role extends far beyond simply acting as a regulatory authority or engaging only in political discourse; it is fundamentally about enhancing public health through science-based information and support.

2. What are the primary functions of the skeletal system?

- A. To produce hormones and regulate metabolism**
- B. To provide support, protect internal organs, and allow for movement**
- C. To assist in digestion and nutrient absorption**
- D. To facilitate respiration and gas exchange**

The primary functions of the skeletal system encompass providing structural support to the body, protecting vital internal organs, and facilitating movement. The skeleton acts as a framework that gives shape to the body, allowing it to maintain its form and posture. This support is crucial for the overall functioning of the body. In terms of protection, the skeletal system plays a vital role in safeguarding essential organs. For example, the rib cage encases the heart and lungs, while the skull protects the brain. This protective function is fundamental to maintaining the integrity and safety of these organs. Additionally, the skeletal system allows for movement in conjunction with the muscular system. Bones serve as levers, and when muscles contract, they pull on the bones to create movement at joints. This interaction between muscles and bones is essential for locomotion and various physical activities. The other options presented focus on functions that are primarily associated with other systems in the body. For instance, the production of hormones and regulation of metabolism is mainly the role of the endocrine system, while processes like digestion and absorption of nutrients are functions of the digestive system. Similarly, respiration and gas exchange are central to the respiratory system, not the skeletal system. Therefore, the statement regarding the skeletal system's functions aligns directly with its established roles

3. What is the process of homeostasis?

- A. The method by which cells divide to create new cells
- B. The process by which organisms regulate their internal environment**
- C. The mechanism by which organisms evolve and adapt
- D. The method of energy transfer within ecosystems

The process of homeostasis is fundamentally about how organisms maintain a stable internal environment despite changes in external conditions. This regulation is crucial for the survival and proper functioning of living organisms, as it ensures that essential variables such as temperature, pH, hydration, and electrolyte balance remain within narrow limits suitable for biological processes. Homeostasis involves various physiological mechanisms such as feedback loops, signaling pathways, and regulatory systems that work together to counteract deviations from an optimal state. For example, humans maintain a body temperature around 37 degrees Celsius and, if the environment becomes too hot or too cold, they initiate appropriate responses such as sweating or shivering to restore balance. In contrast, the other options describe distinct biological processes that do not relate directly to the concept of maintaining internal balance. Cell division creates new cells but does not address internal regulation, evolution focuses on long-term changes in species over generations rather than immediate internal balance, and energy transfer within ecosystems pertains to interactions between organisms and their environment rather than homeostatic control.

4. What is the composition of acid rain?

- A. High amounts of calcium carbonate
- B. Higher amounts of sulfuric and nitric acids**
- C. Excessive oxygen and nitrogen
- D. Contaminated with heavy metals

The composition of acid rain is primarily characterized by higher amounts of sulfuric and nitric acids. Acid rain forms when sulfur dioxide (SO₂) and nitrogen oxides (NO_x) are released into the atmosphere, often from industrial processes, vehicle emissions, and the burning of fossil fuels. These compounds can react with water vapor in the atmosphere to produce sulfuric acid (H₂SO₄) and nitric acid (HNO₃), which then fall to the ground as acid rain. This type of precipitation can have significant environmental impacts, including damage to forests, soils, and aquatic ecosystems. It can lead to the leaching of nutrients from the soil and contribute to the acidification of lakes and streams, adversely affecting plant and animal life. Other choices do not accurately represent the primary components of acid rain. While heavy metals can indeed be a concern in overall pollution and their presence can occur in various forms of precipitation, they do not constitute the defining acidic nature of acid rain. Similarly, calcium carbonate is not a major component of acid rain, and excessive amounts of oxygen and nitrogen are not contributors to the acidity of rainwater. Instead, it's the presence of sulfuric and nitric acids that is crucial to defining the phenomenon of acid rain.

5. According to the philosopher Thomas Kuhn, how does science progress?

- A. Steady and gradual evolution**
- B. Through a series of revolutions**
- C. As a continuation of past theories**
- D. By accumulation of data over time**

Thomas Kuhn's perspective on the progress of science is articulated in his concept of "paradigm shifts" as detailed in his influential work, "The Structure of Scientific Revolutions." He argues that scientific advancement is not a smooth and continuous process but involves periodic revolutions that shift the prevailing paradigms, or frameworks, through which scientific inquiry is conducted. When a dominant paradigm encounters anomalies—observations or problems that cannot be explained by the current scientific framework—scientists initially try to resolve these issues within the existing paradigm. However, when the anomalies become too significant and widespread, a scientific revolution occurs, resulting in a shift to a new paradigm that better addresses these concerns and offers a new way of understanding the world. This process is a departure from the previous framework, leading to significant changes in scientific thought and practice. This notion contrasts with the ideas of gradual evolution or accumulation of data, which imply a more linear progression of knowledge. Kuhn's approach highlights the episodic nature of scientific development, underscoring how revolutions mark critical shifts in scientific understanding rather than merely building upon prior knowledge in a continuous manner.

6. What is entropy a measure of in a system?

- A. Energy conservation**
- B. Order and structure**
- C. Disorder and randomness**
- D. Temperature and pressure**

Entropy is fundamentally a measure of disorder and randomness within a system. In thermodynamics and statistical mechanics, it quantifies the number of microscopic configurations that correspond to the macroscopic state of a system. As entropy increases, it indicates that the system has become more disordered, meaning there are more possible arrangements of its components. For example, when ice melts into water, the structured arrangement of molecules in the solid phase becomes more random in the liquid phase; thus, the entropy of the system increases. This concept also applies broadly to understanding the direction of spontaneous processes, where systems naturally progress towards higher entropy over time, embodying the second law of thermodynamics. In contrast to this definition, energy conservation refers to a different principle where energy cannot be created or destroyed but can only change forms. Order and structure, on the other hand, are related to low entropy states where systems are arranged systematically. Temperature and pressure are essential physical properties but are not measures of entropy. Thus, recognizing entropy's role in representing disorder and randomness is key to understanding its significance in various scientific contexts.

7. What is one of the main waste products released during cellular respiration?

- A. Oxygen**
- B. Carbon dioxide**
- C. Nitrogen**
- D. Glucose**

During cellular respiration, one of the primary waste products generated is carbon dioxide. This process occurs in the cells of living organisms, where glucose is broken down to produce energy in the form of ATP (adenosine triphosphate). The breakdown of glucose involves a series of metabolic pathways, including glycolysis, the citric acid cycle, and oxidative phosphorylation. As glucose is metabolized, oxygen is consumed, and carbon dioxide is produced as a byproduct of the energy extraction process. Specifically, during the citric acid cycle, carbon atoms from glucose are released as carbon dioxide, which then diffuses out of the cells into the bloodstream and is ultimately expelled from the body when we exhale. While oxygen is consumed in cellular respiration and glucose is utilized as the starting substrate, the primary waste product that results from this energy-yielding process is indeed carbon dioxide. Nitrogen does not play a direct role in cellular respiration, and while it is part of the biological processes, it is not a waste product from the breakdown of glucose for energy.

8. What is a mutation?

- A. A harmful environmental change**
- B. A change in the DNA sequence**
- C. A process of natural selection**
- D. A type of cellular respiration**

A mutation refers to a change in the DNA sequence of an organism. This alteration can occur in various ways, such as substitutions, deletions, or insertions of nucleotides, and it can have a range of effects on the organism. Some mutations might lead to changes in the protein produced by a gene, potentially affecting the organism's traits, while others might be silent, having no impact on the functionality of the protein or the organism itself. Understanding mutations is crucial because they are the raw material for evolution. Mutations can introduce new genetic variation into a population, which is then subject to natural selection. This process can lead to the adaptation of species over time. In contrast to the other options, a harmful environmental change does not accurately capture the concept of a mutation, as mutations are specific alterations within the genetic material rather than external influences. The process of natural selection is a mechanism that acts on existing mutations rather than defining what a mutation is. Finally, cellular respiration is a biochemical process for energy production and is unrelated to the genetic changes that define mutations. Thus, acknowledging that a mutation is fundamentally a change in the DNA sequence clarifies its significance in genetics and evolutionary biology.

9. What is Richard Dawkins known for in the scientific community?

- A. Promoting the integration of science and spirituality**
- B. Being a notable scientist who holds atheistic views**
- C. Researching the intersections of faith and science**
- D. Advocating for governmental oversight in scientific research**

Richard Dawkins is widely recognized in the scientific community for his contributions as a prominent biologist, particularly in the fields of evolutionary biology and ethology. One of his most significant contributions is the concept of the "selfish gene," which he popularized in his book of the same name. This idea reshaped the understanding of evolution by emphasizing the role of genes in natural selection, rather than focusing solely on the individual organism or species. Dawkins is also known for his outspoken atheistic views, which he presents in various books and public speeches. His first major work that addressed religion, "The God Delusion," critiques religious belief from a scientific perspective and promotes secularism. This perspective has led to his prominence within discussions about science and religion, highlighting the conflict between science and faith, which resonates with many in the scientific community who advocate for a more evidence-based understanding of the world. His advocacy for atheism and a rational, scientific worldview has made him a central figure in debates regarding the role of science in society, particularly concerning how faith and religion interact with scientific understanding.

10. What are amino acids?

- A. The basic building blocks of proteins**
- B. Natural substances that regulate metabolic processes**
- C. Fatty compounds that store energy**
- D. Minerals that support bone health**

Amino acids are indeed the basic building blocks of proteins. Each protein is made up of long chains of amino acids linked together by peptide bonds, and there are 20 different amino acids that can combine in various sequences to form a vast array of proteins, each with its own unique structure and function. The significance of amino acids extends beyond their role in protein synthesis; they also play critical roles in various metabolic processes. Some amino acids can serve as precursors for neurotransmitters and hormones, contributing to numerous physiological functions in the body. The specific sequence and combinations of amino acids determine the characteristics and actions of each protein, which are essential for cell structure, function, and regulation. While other options mention substances important to the body, such as natural substances regulating metabolic processes or minerals supporting bone health, these descriptions do not accurately define what amino acids are. Amino acids are distinctly characterized by their role in forming proteins, which serves as the basis for many biological processes.