Algonquin College Health Program Assessment (AC-HPAT) Practice Exam (Sample)

Study Guide

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Questions

1. What is the function of the phloem?

- **A. Transporting water from roots to leaves**
- **B. Transporting chemicals throughout the plant**
- **C. Transporting sugars from leaves to other parts of the plant**
- **D. Providing structural support to the plant**

2. Which element's molar mass is closest to 1 g?

- **A. Hydrogen**
- **B. Oxygen**
- **C. Carbon**
- **D. Helium**

3. What process is primarily carried out by platelets in the blood?

- **A. Oxygen transport**
- **B. Immune response**
- **C. Blood clotting**
- **D. Nutrient transport**

4. What is an isotope?

- **A. Atoms with identical numbers of protons and neutrons**
- **B. Atoms of the same element with different numbers of neutrons**
- **C. Atoms of different elements with the same atomic number**
- **D. Atoms that have lost electrons and gained a charge**

5. What are the six kingdoms of living entities?

- **A. Animalia, Plantae, Fungi, Protista, Archaebacteria, Eubacteria**
- **B. Insecta, Mammalia, Reptilia, Amphibia, Fish, Birds**
- **C. Fungi, Plantae, Animalia, Protista, Bacteria, Viruses**
- **D. Monera, Protista, Plantae, Fungi, Animalia, Viruses**

6. What defines a gymnosperm?

- **A. A plant that produces unprotected seeds**
- **B. A fruit-bearing plant**
- **C. A plant that undergoes photosynthesis**
- **D. A plant that reproduces solely via spores**

7. What is the primary function of the circulatory system?

- **A. To absorb nutrients**
- **B. To provide oxygen**
- **C. To distribute blood and associated chemicals through the body**
- **D. To eliminate waste products**

8. Which structure regulates blood flow into the aorta?

- **A. Left ventricle**
- **B. Aortic valve**
- **C. Right ventricle**
- **D. Coronary arteries**

9. What is an essential characteristic of an alcohol?

- **A. Presence of a carbon-carbon triple bond**
- **B. Presence of a hydroxyl functional group (-OH)**
- **C. Presence of a carbon ring structure**
- **D. Presence of at least one carbon-carbon double bond**

10. What is a virus classified as?

- **A. A living organism**
- **B. A complex cell**
- **C. A parasite that can only reproduce within a living host cell**
- **D. An independent organism**

Answers

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

Explanations

1. What is the function of the phloem?

A. Transporting water from roots to leaves

B. Transporting chemicals throughout the plant

C. Transporting sugars from leaves to other parts of the plant

D. Providing structural support to the plant

The phloem is a type of vascular tissue in plants specifically designed for the transport of organic nutrients, primarily sugars produced through photosynthesis in the leaves. This function is crucial because it ensures that all parts of the plant, including roots, stems, and fruits, receive the necessary energy and building blocks for growth, development, and storage. In contrast, transporting water from roots to leaves is primarily the function of xylem, which is another type of vascular tissue responsible for conveying water and minerals. The role of transporting chemicals throughout the plant can pertain to various substances, but it's not the specific function of phloem, which focuses on sugars and other organic nutrients. Additionally, structural support in plants is largely provided by cell types like sclerenchyma and collenchyma, which contribute to the rigidity and support of the plant structure, rather than through the function of phloem. Thus, the defining role of phloem primarily pertains to the movement of sugars and is essential for the plant's energy distribution system.

2. Which element's molar mass is closest to 1 g?

A. Hydrogen

B. Oxygen

C. Carbon

D. Helium

Hydrogen indeed has a molar mass that is closest to 1 g. The molar mass of hydrogen is approximately 1.008 g/mol, making it the lightest element on the periodic table. This lightweight characteristic is significant, especially in various chemical reactions, as it allows for a higher rate of kinetic activity and influences the properties of different compounds. In comparison, oxygen has a molar mass of about 16 g/mol, which is considerably higher than hydrogen. Carbon has a molar mass of approximately 12 g/mol, reflecting its position as a central element in organic chemistry. Helium, being a noble gas, has a molar mass around 4 g/mol, still more than that of hydrogen but lightweight nonetheless. Understanding these values is important for students in health and science fields as it relates to stoichiometry and the calculation of reactions involving different gases and elements.

3. What process is primarily carried out by platelets in the blood?

A. Oxygen transport

B. Immune response

C. Blood clotting

D. Nutrient transport

The process primarily carried out by platelets in the blood is blood clotting. Platelets, or thrombocytes, play a critical role in hemostasis, which is the process that prevents and stops bleeding. When a blood vessel is injured, platelets are activated and aggregate at the site of the injury, forming a temporary "platelet plug." They release various chemicals that help recruit more platelets to the area, as well as promoting the cascade of reactions that ultimately leads to the formation of fibrin, a protein that stabilizes the clot. This entire process ensures that blood loss is minimized while the tissue begins to heal. In contrast, the other processes mentioned are performed by different blood components. Oxygen transport is primarily the function of red blood cells, which contain hemoglobin to bind and carry oxygen from the lungs to the tissues. The immune response involves white blood cells, which are responsible for fighting infections and protecting the body against foreign substances. Nutrient transport is carried out by plasma and other components in the blood, which carry nutrients needed by various tissues throughout the body. Thus, platelets are specifically essential for the blood clotting mechanism.

4. What is an isotope?

A. Atoms with identical numbers of protons and neutrons

B. Atoms of the same element with different numbers of neutrons

C. Atoms of different elements with the same atomic number

D. Atoms that have lost electrons and gained a charge

An isotope refers specifically to atoms of the same element that have the same number of protons but differ in the number of neutrons. This distinction in neutron count leads to variations in atomic mass, but because they are still the same element (having the same number of protons), they exhibit similar chemical properties. For example, carbon has several isotopes, including carbon-12, which has 6 neutrons, and carbon-14, which has 8 neutrons. These isotopes have different masses but are both chemically classified as carbon. This definition aligns precisely with the characteristics that define isotopes, making this understanding fundamental in fields like chemistry, nuclear physics, and various applications such as radiometric dating and medical imaging.

5. What are the six kingdoms of living entities?

A. Animalia, Plantae, Fungi, Protista, Archaebacteria, Eubacteria

B. Insecta, Mammalia, Reptilia, Amphibia, Fish, Birds

C. Fungi, Plantae, Animalia, Protista, Bacteria, Viruses

D. Monera, Protista, Plantae, Fungi, Animalia, Viruses

The six kingdoms of living entities are accurately represented by the choice that includes Animalia, Plantae, Fungi, Protista, Archaebacteria, and Eubacteria. This classification system reflects the diversity of life based on fundamental differences in cellular organization and genetic characteristics. Animalia encompasses all animals, which are multicellular, eukaryotic organisms that are typically motile and consume organic material for energy. Plantae includes all plants, which are primarily multicellular and autotrophic, producing their own food through photosynthesis. Fungi consists of organisms that are mostly decomposers, aiding in the breakdown of dead organic material. Protista is a diverse group mainly consisting of unicellular organisms (though it includes some multicellular forms), typically eukaryotic and can be autotrophic or heterotrophic. Archaebacteria and Eubacteria represent prokaryotic life forms, but they are distinguished from each other; Archaebacteria often inhabit extreme environments while Eubacteria include the more common bacteria that can be found in various environments. The other options listed do not accurately represent the classified kingdoms of living organisms. While some of them include relevant groups (like Fungi and Animalia), they either misclassify or omit significant

6. What defines a gymnosperm?

A. A plant that produces unprotected seeds

B. A fruit-bearing plant

C. A plant that undergoes photosynthesis

D. A plant that reproduces solely via spores

A gymnosperm is specifically defined as a plant that produces unprotected seeds, which is the primary characteristic that distinguishes it from other types of plants. Unlike angiosperms, which are flowering plants that produce seeds encased in fruit, gymnosperms produce seeds that are not enclosed within a fruit. These seeds are typically found on the surface of cones or other structures. This unprotected nature of the seeds is a critical aspect of gymnosperms, which includes groups such as conifers, cycads, ginkgoes, and gnetophytes. The other options highlight different characteristics of plants. Fruit-bearing plants refer to angiosperms, making this choice not applicable to gymnosperms. Regarding photosynthesis, while all plants do undergo this process, it is not a defining feature of gymnosperms specifically, as it applies to all plants. Lastly, reproduction solely via spores is a characteristic associated with non-seed plants such as ferns and mosses, which do not fall under the category of gymnosperms. Therefore, the answer centers around the unique aspect of gymnosperms producing unprotected seeds.

7. What is the primary function of the circulatory system?

A. To absorb nutrients

B. To provide oxygen

C. To distribute blood and associated chemicals through the body

D. To eliminate waste products

The primary function of the circulatory system is to distribute blood and associated chemicals through the body. This system is responsible for transporting essential substances such as oxygen, nutrients, hormones, and waste products between various tissues and organs. Blood, as the primary vehicle of transportation, enables the delivery of these substances to cells where they are utilized for metabolic processes, energy production, and nourishment. In this context, while the roles of absorbing nutrients, providing oxygen, and eliminating waste products are important functions of the body, they are all part of the broader function of the circulatory system. For instance, oxygen is carried by the blood from the lungs to the body cells, and waste products are transported from the tissues to the excretory organs for removal. Hence, the circulatory system's overarching role is to facilitate this extensive distribution network, ensuring that all body parts receive what they need to function optimally and maintain homeostasis.

8. Which structure regulates blood flow into the aorta?

A. Left ventricle

B. Aortic valve

C. Right ventricle

D. Coronary arteries

The aortic valve is the structure that plays a crucial role in regulating blood flow into the aorta. This valve is located between the left ventricle of the heart and the aorta. Its primary function is to open during ventricular systole, allowing oxygenated blood from the left ventricle to flow into the aorta. Once the ventricles finish contracting, the valve closes to prevent backflow of blood into the left ventricle. This regulation is essential for maintaining efficient blood circulation throughout the body. By controlling when blood enters the aorta, the aortic valve ensures that the downstream tissues receive an adequate supply of oxygenated blood while also contributing to the overall pressure and flow dynamics in the cardiovascular system. Thus, the aortic valve is key to the proper functioning of the heart and circulatory system.

9. What is an essential characteristic of an alcohol?

A. Presence of a carbon-carbon triple bond

B. Presence of a hydroxyl functional group (-OH)

C. Presence of a carbon ring structure

D. Presence of at least one carbon-carbon double bond

The essential characteristic of an alcohol is the presence of a hydroxyl functional group (-OH). This functional group is what defines alcohols and differentiates them from other organic compounds. The hydroxyl group is attached to a carbon atom, and its presence is responsible for the unique properties of alcohols, such as their ability to form hydrogen bonds, which influences their physical and chemical behavior. Alcohols can vary in structure, meaning they can be found in linear, branched, or even cyclic molecules, but the defining feature will always be that hydroxyl group. Other organic compounds may have various functional groups, but the -OH group is specifically characteristic of alcohols, contributing to their classification and reactivity in chemical reactions.

10. What is a virus classified as?

A. A living organism

B. A complex cell

C. A parasite that can only reproduce within a living host cell

D. An independent organism

A virus is classified as a parasite that can only reproduce within a living host cell. This classification highlights the unique nature of viruses in their reliance on host cells for replication and survival. Unlike living organisms, viruses do not possess the cellular machinery necessary for metabolism or reproduction on their own. Instead, they infect host cells, utilizing the host's cellular machinery to replicate themselves and produce new virus particles. This parasitic relationship underscores their dependence on living organisms to propagate, differentiating them from independent organisms that can sustain themselves outside of a host. Understanding this classification is essential in the field of health and disease, particularly in studying how viral infections occur and the strategies involved in treating viral diseases.