Natural Science CLEP Prep Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Questions

1. What is the term for a combination of oxygen and nitrogen in the atmosphere?

A. Ozone

B. Stratospheric

C. Aerosol

D. Nitrogen dioxide

2. What type of layer forms the upper part of Earth's atmosphere?

A. Ionosphere

B. Stratosphere

C. Thermosphere

D. Troposphere

3. What kind of energy is stored in the nucleus of an atom?

A. Solar energy

B. Kinetic energy

C. Nuclear energy

D. Geothermal energy

4. What type of force holds nuclei together?

A. GRAVITATIONAL FORCE

B. ELECTROMAGNETIC FORCE

C. WEAK FORCE

D. STRONG FORCE

5. What is the smallest unit of matter?

A. Atom

B. Molecule

C. Ion

D. Electron

6. What is an example of a chemical property?

A. Color

B. Flammability

C. Hardness

D. Length

7. What element is present in all organic molecules?

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

8. What element do all living things depend on for growth and survival?

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

9. What is Newton's Second Law of Motion?

- **A. Force = Mass x Acceleration**
- **B. Objects in motion tend to stay in motion**
- **C. Force is equal to the change in momentum over a period of time**
- **D. Objects at rest tend to stay at rest**

10. Which of the following is an example of a living organism?

- **A. A lightning bolt**
- **B. A rock**
- **C. A tree**
- **D. The Sun**

Answers

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

Explanations

1. What is the term for a combination of oxygen and nitrogen in the atmosphere?

A. Ozone

B. Stratospheric

C. Aerosol

D. Nitrogen dioxide

The correct term for a combination of oxygen and nitrogen in the atmosphere is Ozone. Ozone is a form of oxygen that is made up of three oxygen atoms, while oxygen in its regular form is made up of two oxygen atoms. Stratospheric refers to the layer of the atmosphere that is above the troposphere, so it is not the term for a combination of oxygen and nitrogen. Aerosol refers to small particles suspended in the atmosphere, such as pollutants or water droplets, and not a combination of oxygen and nitrogen. Nitrogen dioxide is a compound made up of nitrogen and oxygen, but it is not the term for the combination of oxygen and nitrogen in the atmosphere.

2. What type of layer forms the upper part of Earth’s atmosphere?

A. Ionosphere

B. Stratosphere

C. Thermosphere

D. Troposphere

The stratosphere is the layer of Earth's atmosphere above the troposphere and below the mesosphere. It is primarily composed of ozone which absorbs harmful ultraviolet radiation from the sun. The other options, ionosphere, thermosphere, and troposphere, are all layers within the stratosphere. The ionosphere is a layer within the thermosphere, the thermosphere is a layer within the mesosphere, and the troposphere is the bottom layer of the atmosphere. Therefore, they are not the correct answer for the type of layer that forms the upper part of Earth's atmosphere.

3. What kind of energy is stored in the nucleus of an atom?

A. Solar energy

B. Kinetic energy

C. Nuclear energy

D. Geothermal energy

Nuclear energy is the only type of energy stored in the nucleus of an atom. Solar energy is a form of energy that comes from the sun, while kinetic energy is the energy of motion. Geothermal energy is the heat from the Earth's core. None of these other options apply to the energy stored in the nucleus of an atom.

4. What type of force holds nuclei together?

A. GRAVITATIONAL FORCE

B. ELECTROMAGNETIC FORCE

C. WEAK FORCE

D. STRONG FORCE

Nuclei are comprised of positively charged protons and neutral neutrons. The electromagnetic force which governs interactions between charged particles is not able to overcome the repulsive forces between these protons, making it an incorrect answer. The weak force is responsible for radioactive decay, so it does not hold nuclei together, making it also an incorrect answer. The gravitational force is an extremely weak force compared to the strong force, and cannot overcome the strong force which binds particles together, making it an incorrect answer. Therefore, the correct answer is the strong force. It is responsible for binding quarks together to form protons and neutrons, and binding protons and neutrons together to form nuclei, making it the strongest force in the universe.

5. What is the smallest unit of matter?

A. Atom

B. Molecule

C. Ion

D. Electron

Electrons are the smallest unit of matter because they are subatomic particles and are not made up of smaller particles. Atoms are made up of protons, neutrons, and electrons, which are all further divided into smaller particles. Molecules are made up of atoms bonded together and are also not the smallest unit of matter. Ions are atoms or molecules that have gained or lost electrons, thus they still consist of multiple particles and are not the smallest. Therefore, the correct answer is D, electrons.

6. What is an example of a chemical property?

A. Color

B. Flammability

C. Hardness

D. Length

An example of a chemical property is flammability, which refers to a substance's ability to undergo combustion in the presence of oxygen. Color, hardness, and length are all examples of physical properties, which refer to characteristics that can be observed or measured without changing the substance's chemical composition. Since these properties do not involve a chemical reaction, they are not considered examples of a chemical property.

7. What element is present in all organic molecules?

A. Carbon

B. Hydrogen

C. Oxygen

D. Nitrogen

Carbon is present in all organic molecules because it is able to form strong bonds with many other atoms, including itself. This allows for the formation of complex and diverse molecules necessary for life. While hydrogen, oxygen, and nitrogen are also common in organic molecules, they are not present in all of them. For example, many carbohydrates have the formula (CH2O)n, and do not contain nitrogen. Oxygen is also not found in all organic molecules, as some may only contain carbon and hydrogen, such as oils and waxes. Nitrogen is essential for life, but is not the defining element of organic molecules. Therefore, A is the only correct answer.

8. What element do all living things depend on for growth and survival?

A. Oxygen

B. Carbon

C. Hydrogen

D. Nitrogen

All living things require carbon for growth and survival. Carbon is the basis of organic molecules, such as carbohydrates, lipids, proteins, and nucleic acids, which are essential for life processes like metabolism and growth. Oxygen is also crucial for survival, but not all living things require oxygen for growth. Hydrogen and nitrogen are important elements in living organisms, but they do not play the same central role as carbon does. Hence, they are not the correct answer to this question.

9. What is Newton's Second Law of Motion?

A. Force = Mass x Acceleration

B. Objects in motion tend to stay in motion

C. Force is equal to the change in momentum over a period of time

D. Objects at rest tend to stay at rest

Newton's Second Law of Motion states that the force applied to an object is directly proportional to the mass of the object and its resulting acceleration. This means that as the mass of an object increases, the force needed to accelerate it also increases. This law also shows that the acceleration of an object is inversely proportional to its mass, meaning that as the mass increases, the acceleration decreases. Option B, objects in motion tend to stay in motion, is referring to Newton's First Law of Motion, which states that an object will continue moving at the same velocity unless acted upon by an external force. Option C may be confused with the Law of Conservation of Momentum, which states that the total momentum of any closed system will remain constant unless acted upon by external forces. Finally, option D is referring to Newton's First Law again, but specifically for objects at rest.

10. Which of the following is an example of a living organism?

A. A lightning bolt

B. A rock

C. A tree

D. The Sun

A lightning bolt is a powerful electrical discharge, not a living organism. It does not grow, reproduce, or respond to its environment like living organisms do. A rock is an inanimate object and does not exhibit any characteristics of living organisms. It does not require energy, grow, or reproduce. The Sun is a star and is not considered a living organism. It does not consume or use energy in the same way living organisms do. It also does not exhibit any characteristics of living things such as growth or reproduction. A tree is a living organism as it grows, reproduces, and responds to its environment in order to survive. It requires energy from the sun and is able to convert it into food through photosynthesis. Therefore, C is the correct answer.