Grade 9 Biological Diversity Unit Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Questions

1. What is the significance of seed banks?

A. They only preserve seeds of agricultural importance

B. They help in ensuring genetic diversity for future generations

C. They promote the extinction of species

D. They focus solely on crop production

2. Which type of reproduction is observed in plants?

A. Asexual reproduction only

B. Sexual reproduction only

C. Both sexual and asexual reproduction

D. Neither type of reproduction

3. What reproductive structures do mushrooms and other fungi produce for reproduction?

A. Seeds

B. Eggs

C. Spore

D. Gametes

4. Which of the following traits would NOT be desirable for a wheat farmer in artificial selection?

A. High nutrition

B. Resistance to cold

C. Weak structural integrity

D. Disease/insect resistance

5. Which of the following is a disadvantage of using artificial selection for many generations?

A. It always leads to increased genetic diversity

B. It ensures only desirable traits are passed on

C. Undesirable traits may be passed along with desirable traits

D. It eliminates all health problems within species

6. Which of the following statements is true regarding species interactions in a diverse ecosystem?

A. They generally lead to increased competition

B. They can enhance balance and stability

C. They reduce the total number of species present

D. They lead to habitat destruction

7. How many chromosomes are present in a typical human body cell?

A. 23

B. 46

C. 30

D. 92

8. What type of reproduction occurs during binary fission?

A. A sexual reproduction

B. A type of sexual reproduction

C. A form of asexual reproduction

D. A hybrid form of reproduction

9. What is a potential positive outcome of wildlife corridors?

A. Increased human access to wildlife areas

B. Isolation of species from predators

C. Strengthening genetic diversity

D. Reduction in habitat size

10. What is the definition of a chromosome?

A. A tightly coiled strand of DNA

B. A double-stranded RNA molecule

C. A hereditary unit consisting of DNA

D. A type of RNA that carries genetic codes

Answers

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

Explanations

1. What is the significance of seed banks?

A. They only preserve seeds of agricultural importance

B. They help in ensuring genetic diversity for future generations

C. They promote the extinction of species

D. They focus solely on crop production

Seed banks play a crucial role in the preservation of genetic diversity, which is vital for the survival of various plant species. By storing a wide range of seeds, including those from wild plants as well as agricultural varieties, seed banks help maintain a genetic reservoir that can be used to restore ecosystems and support food security in the future. This genetic diversity is important for adapting to changing conditions, such as climate change, pests, and diseases. The seeds stored in these facilities can be viable for many years and can be planted later to regenerate lost plant populations or to enhance crop resilience. This practice ensures that future generations have access to a diverse range of plants, which is essential not only for agriculture but also for maintaining healthy ecosystems.

2. Which type of reproduction is observed in plants?

A. Asexual reproduction only

B. Sexual reproduction only

C. Both sexual and asexual reproduction

D. Neither type of reproduction

Plants can reproduce through both sexual and asexual methods, making the option that states both forms of reproduction is the correct answer. In sexual reproduction, plants produce seeds through the process of pollination and fertilization. Pollination can occur through various agents such as wind, water, or animals, leading to the formation of seeds that can grow into new plants. This method promotes genetic diversity, which is essential for adaptation and evolution in changing environments. On the other hand, asexual reproduction in plants occurs without the involvement of seeds and is achieved through various techniques such as budding, fragmentation, or vegetative propagation. Examples include a potato sprouting from a tuber, strawberries producing runners, or succulents growing from leaf cuttings. Asexual reproduction allows for quick colonization of an area because it does not require the complex processes associated with sexual reproduction. Together, these two methods illustrate the diverse strategies plants use to reproduce and thrive in various environments, thereby enhancing their survival and diversity as a group.

3. What reproductive structures do mushrooms and other fungi produce for reproduction?

A. Seeds

B. Eggs

C. Spore

D. Gametes

Mushrooms and other fungi reproduce through the production of spores, which are specialized reproductive cells. Spores are typically unicellular and can develop into new organisms under suitable conditions. This method of reproduction allows fungi to spread and colonize new environments efficiently, as spores can be dispersed by wind, water, or animals. In contrast, seeds are characteristic of flowering plants and are not produced by fungi. Eggs are female reproductive cells in many organisms but are not associated with fungal reproduction. Gametes, which include both eggs and sperm, are involved in sexual reproduction in many living organisms, but fungi often rely on sporulation, which can be asexual. Thus, the correct answer emphasizes the unique reproductive strategy of fungi, highlighting the significance of spores in their life cycle.

4. Which of the following traits would NOT be desirable for a wheat farmer in artificial selection?

A. High nutrition

B. Resistance to cold

C. Weak structural integrity

D. Disease/insect resistance

In the context of artificial selection for wheat farming, traits that contribute to the overall success of crop yield and quality are prioritized. A trait such as weak structural integrity would not be desirable because it would make the plants more susceptible to physical damage from environmental factors like wind, rain, or the weight of their own grain. Strong structural integrity is essential for the plants to withstand these stressors and grow successfully. Furthermore, traits like high nutrition, resistance to cold, and disease/insect resistance are all advantageous for a wheat farmer. High nutritional value ensures that the crop is beneficial for consumption, while resistance to cold allows the plants to thrive in various climates, thus extending the growing season. Additionally, being resilient to diseases and pests reduces the need for chemical interventions and can lead to a more sustainable farming practice. In contrast, weak structural integrity compromises the overall stability and productivity of the wheat, making it a trait that would be negatively selected against in agricultural practices.

5. Which of the following is a disadvantage of using artificial selection for many generations?

A. It always leads to increased genetic diversity

B. It ensures only desirable traits are passed on

C. Undesirable traits may be passed along with desirable traits

D. It eliminates all health problems within species

Using artificial selection over many generations can indeed lead to the unintentional passing along of undesirable traits alongside desirable ones. This happens because, while breeders often select for specific traits that are seen as advantageous or beneficial, the underlying genetic makeup can become limited or skewed toward certain characteristics. As a result, when a desired trait is selected repeatedly, it can inadvertently enhance or retain other traits that may be harmful or less favorable. This can lead to a reduced genetic pool, increasing the risk of genetic disorders or health issues within the population. This phenomenon is often seen with domesticated animals and certain crop species, where traits like size or yield are prioritized at the expense of overall health and resilience. While artificial selection can effectively enhance particular traits, it is essential to recognize the risks associated with it, particularly with regard to the broader genetic diversity and health of the species involved.

6. Which of the following statements is true regarding species interactions in a diverse ecosystem?

A. They generally lead to increased competition

B. They can enhance balance and stability

C. They reduce the total number of species present

D. They lead to habitat destruction

In a diverse ecosystem, species interactions often play a crucial role in enhancing balance and stability. This is because a variety of species can interact in multiple ways—such as through predation, mutualism, and competition—creating complex relationships that contribute to ecosystem resilience. For instance, beneficial interactions like pollination and seed dispersal can help maintain plant populations, while predation can regulate species abundance, preventing any one species from dominating and ensuring that resources remain available for a variety of organisms. Diversity in ecosystems helps to ensure that different species fulfill various ecological roles, contributing to a more stable ecosystem overall. In times of environmental stress—such as climate change or natural disasters—a diverse ecosystem can better withstand and adapt to changes, as different species may respond differently to challenges. This resilience is key to maintaining biodiversity itself, as stable ecosystems can support a larger variety of life forms. In contrast, increased competition generally indicates that resources are limited, which may lead to less stability rather than enhancement. The idea that diverse interactions reduce species numbers contradicts the principle that biodiversity is often crucial for ecosystem health. Lastly, species interactions themselves do not directly lead to habitat destruction; rather, human activity is a more common driver of such destruction.

7. How many chromosomes are present in a typical human body cell?

A. 23

B. 46

C. 30

D. 92

A typical human body cell contains 46 chromosomes. This is because human cells are diploid, meaning they have two sets of chromosomes—one inherited from each parent. Each set consists of 23 chromosomes, which collectively results in 46 chromosomes. This arrangement is crucial for maintaining the stability of genetic information during cell division, as it ensures that each daughter cell receives an exact copy of the genetic material. In the context of human biology, the diploid number is important for processes such as growth, development, and tissue repair. During reproduction, however, gametes (sperm and egg cells) are haploid, containing only 23 chromosomes, which allows for the restoration of the diploid number upon fertilization. Understanding the chromosome number is fundamental in studies related to genetics, inheritance, and variations within a species.

8. What type of reproduction occurs during binary fission?

A. A sexual reproduction

B. A type of sexual reproduction

C. A form of asexual reproduction

D. A hybrid form of reproduction

Binary fission is a method of reproduction primarily observed in single-celled organisms, like bacteria. During binary fission, the organism duplicates its genetic material and divides into two identical daughter cells. This process does not involve the fusion of gametes and does not require a mate, which are characteristics of sexual reproduction. Asexual reproduction, which includes binary fission, allows for the rapid increase in population size, as it can occur quickly under favorable conditions. In essence, because binary fission creates genetically identical offspring from a single parent without the involvement of sexual processes, it is accurately categorized as a form of asexual reproduction.

9. What is a potential positive outcome of wildlife corridors?

A. Increased human access to wildlife areas

B. Isolation of species from predators

C. Strengthening genetic diversity

D. Reduction in habitat size

Wildlife corridors are designed to facilitate the safe movement of animals between fragmented habitats. A significant positive outcome associated with the establishment of these corridors is the strengthening of genetic diversity within populations. When animals can move freely between different areas, they can intermingle with others, which helps to prevent inbreeding and the associated problems that come with a lack of genetic diversity. Greater genetic diversity is crucial as it increases the resilience of species to diseases, environmental changes, and other threats. It allows populations to adapt more effectively to their changing surroundings, ensuring their survival in the long term. Wild populations with higher genetic diversity are generally more robust, making them better equipped to cope with challenges, ultimately supporting the overall health of ecosystems. Other outcomes related to this topic, like increased human access, isolation from predators, or reductions in habitat size, do not contribute positively to biodiversity and the long-term sustainability of wildlife populations. Therefore, the strengthening of genetic diversity through wildlife corridors represents a significant benefit in the conservation of species and the ecosystems they inhabit.

10. What is the definition of a chromosome?

A. A tightly coiled strand of DNA

B. A double-stranded RNA molecule

C. A hereditary unit consisting of DNA

D. A type of RNA that carries genetic codes

A chromosome is defined as a tightly coiled strand of DNA. This structure is essential for the organization and packaging of genetic material within the cell. Chromosomes become highly compacted during cell division, ensuring that DNA is accurately distributed into daughter cells. In humans, for example, most cells contain 46 chromosomes, which house the genetic instructions necessary for the growth, development, and functioning of the organism. The other options describe various aspects of genetic material but do not capture the complete definition of a chromosome. A double-stranded RNA molecule refers to a different biological entity that is not involved in the structural organization of genetic material as chromosomes are. A hereditary unit consisting of DNA is a broader term that could refer to genes, which are segments of DNA found within chromosomes but do not describe the whole structure. Similarly, a type of RNA that carries genetic codes refers to mRNA, which plays a role in protein synthesis rather than serving as the physical structure that houses genetic information like chromosomes do.