

Arizona State University (ASU) BIO331 Animal Behavior Exam 1 Practice (Sample)

Study Guide



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SAMPLE

Questions

SAMPLE

1. What do geneticists aim to understand through the study of narrow sense heritability?
 - A. The relationship between genotype and phenotype
 - B. The evolution of populations over time
 - C. The inheritance patterns of diseases
 - D. The impact of natural selection on genetic variation
2. How does the 'selfish herd' theory impact predator-prey dynamics?
 - A. It increases the number of predators
 - B. It decreases the success rate of predators
 - C. It encourages solitary behavior
 - D. It leads to mutualistic relationships
3. What are the two primary types of genetic effects in behavioral genetics?
 - A. Dominant and recessive effects
 - B. Additive and non-additive effects
 - C. Environmental and genetic effects
 - D. Altruistic and selfish effects
4. Why is mate guarding considered important in reproductive strategies?
 - A. It increases genetic diversity
 - B. It enhances maternal investment
 - C. It ensures reproductive success by preventing mate losses
 - D. It reduces the need for offspring care
5. How do researchers gather information without manipulating animal behavior?
 - A. Through experimental methods
 - B. Through observational methods
 - C. Through comparative methods
 - D. Through analytical methods

6. How do closely related species typically behave according to the comparative method?
- A. They exhibit vastly different behaviors
 - B. They tend to display similar behaviors
 - C. Their behaviors are mostly random
 - D. They behave identically in all situations
7. What role does one gene have in the context of epistatic effects?
- A. It enhances the effect of another gene
 - B. It completely eliminates the function of another gene
 - C. It modifies the effect of another gene
 - D. It has no interaction with other genes
8. In the context of animal behavior, what does "habitat" refer to?
- A. The geographic region of the entire planet
 - B. A type of social structure among animals
 - C. The environment where a species lives and interacts with other organisms
 - D. Only the physical structures used for shelter
9. What is "imprinting" in animal behavior?
- A. A form of learning occurring at a specific life stage
 - B. A strategy for finding food
 - C. A method of communication between species
 - D. A mating ritual performed by males
10. What is the difference between innate and learned behaviors?
- A. Innate behaviors are learned from others while learned behaviors are instinctual
 - B. Learning is faster than instinct for all animals
 - C. Innate behaviors are instinctual and genetically programmed, while learned behaviors are acquired through experience
 - D. Only innate behaviors are important for survival

Answers

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

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Explanations

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1. What do geneticists aim to understand through the study of narrow sense heritability?

A. The relationship between genotype and phenotype

B. The evolution of populations over time

C. The inheritance patterns of diseases

D. The impact of natural selection on genetic variation

The correct choice reflects the goal of geneticists in understanding narrow sense heritability, which focuses specifically on the portion of phenotypic variance that can be attributed to additive genetic variance. In other words, it measures how much of the variation in a trait within a population can be passed from parents to offspring due to genetic factors. This understanding is crucial for predicting how traits will respond to selection pressures over generations, as it helps illustrate the connection between the genetic makeup (genotype) of individuals and their observable traits (phenotype). Narrow sense heritability is particularly important when considering breeding strategies in both agriculture and conservation biology, as it can inform decisions about which individuals are most likely to produce offspring with desirable traits based on their genetic contributions. This concept forms the foundation for many studies in quantitative genetics, allowing researchers to quantify how traits may evolve in response to selective pressures.

2. How does the 'selfish herd' theory impact predator-prey dynamics?

A. It increases the number of predators

B. It decreases the success rate of predators

C. It encourages solitary behavior

D. It leads to mutualistic relationships

The 'selfish herd' theory suggests that individuals in a population can reduce their risk of predation by positioning themselves in a group. This theory posits that by clustering together, prey animals can lower their individual chances of being targeted by a predator. The idea is that when animals are in a group, the predator will often focus its attention on the outer members of the herd, effectively increasing the safety for those within the center. This behavior impacts predator-prey dynamics by decreasing the success rate of predators. When prey are bunched together, it becomes more challenging for predators to single out an individual. Predators may have to exert more energy and take more time to catch their prey, which can lead to reduced hunting efficiency. This dynamic can ultimately influence the overall population of both prey and predators, as decreased predation success can lead to increased survival rates for prey. In contrast, solitary behavior would not capitalize on the protective benefits of group living and may actually increase the risk of predation. Mutualistic relationships involve different species benefiting each other, which does not directly relate to the selfish herd concept that focuses on individuals within the same species acting in their self-interest to avoid predation. Increasing the number of predators does not align with the direct implications of selfish

3. What are the two primary types of genetic effects in behavioral genetics?

- A. Dominant and recessive effects
- B. Additive and non-additive effects
- C. Environmental and genetic effects
- D. Altruistic and selfish effects

The two primary types of genetic effects in behavioral genetics are additive and non-additive effects. Additive effects refer to the cumulative influence of multiple alleles at different loci, where the effect of each allele contributes independently to the phenotype. This means that the more copies of the contributing alleles an individual has, the greater the overall effect on behavior. In contrast, non-additive effects involve interactions between alleles, such as dominance and epistasis, where the effect of one allele can mask or modify the effect of another. These interactions are crucial for understanding how complex traits, including behaviors, develop and manifest in organisms. This distinction between additive and non-additive effects is foundational in behavioral genetics because it helps researchers understand the heritability of traits and how various genetic factors contribute to behavioral outcomes. Understanding these genetic influences aids in studying the evolution of behavior and the underlying mechanisms that drive variation in behavior among individuals.

4. Why is mate guarding considered important in reproductive strategies?

- A. It increases genetic diversity
- B. It enhances maternal investment
- C. It ensures reproductive success by preventing mate losses
- D. It reduces the need for offspring care

Mate guarding is a crucial behavior in reproductive strategies because it actively helps to ensure reproductive success by preventing the loss of a mate to competitors. This behavior typically involves one partner, often the male in many species, staying close to their mate during the breeding season to protect them from rival males that might attempt to mate with them. By doing so, they increase the likelihood that their genetic material will be passed on to the next generation, ensuring that their own reproductive interests are secured. This strategy is particularly important in environments where the risk of infidelity is high, or where there is intense competition for mates. Through mate guarding, individuals can minimize the chances of having their mates wooed away, thereby maximizing their own reproductive output. In contrast, the other options highlight different aspects of reproductive strategies that are not directly related to the immediate benefits of mate guarding. While increasing genetic diversity, enhancing maternal investment, and reducing the need for offspring care are all relevant to reproductive success in various contexts, they do not specifically address the protective role that mate guarding plays in ensuring an individual's access to a mate and, consequently, their reproductive success.

5. How do researchers gather information without manipulating animal behavior?

A. Through experimental methods

B. Through observational methods

C. Through comparative methods

D. Through analytical methods

Researchers gather information without manipulating animal behavior primarily through observational methods. This approach involves watching and recording the natural behaviors of animals in their habitats without intervening or altering their environment. By doing so, researchers can obtain authentic data that reflects the true behaviors, social interactions, and ecological dynamics of the species being studied. Observational methods are crucial for understanding animal behavior in contexts that may be altered or influenced by experimental manipulation, allowing for a clearer picture of how behaviors develop and function in nature. These methods can include techniques such as focal animal sampling, scan sampling, and recording behavioral sequences, all of which contribute to an in-depth understanding of animal behavior in a naturalistic setting.

6. How do closely related species typically behave according to the comparative method?

A. They exhibit vastly different behaviors

B. They tend to display similar behaviors

C. Their behaviors are mostly random

D. They behave identically in all situations

Closely related species often exhibit similar behaviors due to their shared evolutionary history and genetic makeup. This phenomenon is rooted in the concept of phylogeny, where the evolutionary relationships among species can influence their behavioral traits, as these traits may be passed down from their common ancestors. As a result, behaviors such as mating rituals, foraging strategies, and social interactions can show remarkable similarities among species that are closely related. The comparative method specifically analyzes behaviors among species that share a common lineage to identify patterns and infer the evolutionary pressures that may have shaped those behaviors. This approach allows researchers to understand how certain behaviors have evolved and adapted in different environments or contexts while still reflecting underlying similarities due to their relatedness. In contrast, behaviors that are vastly different might suggest a long separation in evolutionary history or distinct ecological adaptations that have led to divergent behavioral strategies. Random behaviors do not align with the idea of evolutionary adaptation or phylogenetic relationships, while identical behaviors in all situations would be unlikely due to the influence of various environmental factors and individual variation within species.

7. What role does one gene have in the context of epistatic effects?

- A. It enhances the effect of another gene
- B. It completely eliminates the function of another gene
- C. It modifies the effect of another gene
- D. It has no interaction with other genes

In the context of epistatic effects, a single gene can significantly influence how another gene expresses its traits, thereby modifying the effect of that other gene. This means that the presence or variant of one gene can alter the phenotypic outcome that results from the expression of a different gene. For example, in certain genetic combinations, an epistatic gene may mask or alter the expression of another gene, leading to a different trait or characteristic being exhibited than would occur alone. This interplay showcases the complexity of genetic interactions and highlights how multiple genes work together to determine phenotypic traits in an organism. It illustrates the concept of epistasis, where one gene's effects depend on the presence of one or more other genes, making the overall genetic landscape more intricate than individual genes acting independently.

8. In the context of animal behavior, what does “habitat” refer to?

- A. The geographic region of the entire planet
- B. A type of social structure among animals
- C. The environment where a species lives and interacts with other organisms
- D. Only the physical structures used for shelter

Habitat refers to the specific environment where a species lives, including both the physical and biological components. This encompasses not only the physical characteristics of the area, such as climate, vegetation, and geography, but also the interactions that occur within that environment, including relationships with other organisms. Understanding habitat is crucial in animal behavior because it influences various aspects of an organism's life, such as feeding, mating, and social interactions. The habitat provides the resources necessary for survival and reproduction, and the conditions faced can shape behavioral patterns and adaptations over time. This comprehensive view of habitat is why this option is the most accurate description in the context of animal behavior.

9. What is "imprinting" in animal behavior?

- A. A form of learning occurring at a specific life stage
- B. A strategy for finding food
- C. A method of communication between species
- D. A mating ritual performed by males

Imprinting refers to a critical form of learning that occurs during a specific and often sensitive period in an animal's development, usually shortly after birth or hatching. This process often involves an animal forming attachments or recognizing certain stimuli, such as the first moving object they see, which is typically their parent. For instance, in many bird species like ducks or geese, the chicks will follow the first large moving object they encounter, which is usually their mother. This attachment plays a crucial role in their survival, as it helps them learn vital behaviors and survival skills from their parent. The specificity and timing of imprinting are what set it apart from other forms of learning; it usually occurs rapidly and is very persistent, meaning that the associations made during this period are often not easily unlearned. Thus, the correct answer encapsulates the essential characteristics of imprinting as a specialized learning process that is inherently linked to a particular developmental stage in an animal's life. Other options, such as strategies for finding food, methods of communication, or mating rituals, do not accurately capture this unique aspect of animal behavior.

10. What is the difference between innate and learned behaviors?

- A. Innate behaviors are learned from others while learned behaviors are instinctual
- B. Learning is faster than instinct for all animals
- C. Innate behaviors are instinctual and genetically programmed, while learned behaviors are acquired through experience
- D. Only innate behaviors are important for survival

Innate behaviors are instinctual and genetically programmed actions that an organism is born with, which means they are not dependent on experience or environmental influences. These behaviors often serve essential functions for survival, such as feeding, mating, and responding to threats. Examples of innate behaviors include reflexes and fixed action patterns, which are consistent across individuals of the same species. In contrast, learned behaviors are acquired through experience and tend to be more flexible. These behaviors can change based on interactions with the environment, social learning, and individual experiences. This distinction is crucial because while innate behaviors provide a foundation for survival, learned behaviors allow organisms to adapt to their specific circumstances, enhancing their chances of coping with environmental challenges. Understanding this difference underscores the balance between instinct and learning in the animal kingdom, highlighting how both innate and learned behaviors contribute to an organism's overall behavior and adaptability.