

# Breeding and Genetics Exam 2 Practice (Sample)

Study Guide



Everything you need from our exam experts!

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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

## 1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

## 2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

## 3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

## 4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

## 5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

## 6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

## Questions

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1. What is one effect of high progeny equivalency in a breeding program?
  - A. Increased variance in offspring traits
  - B. Reduced need for offspring testing
  - C. Higher genetic stability and accuracy
  - D. Improvement in phenotypic variance
  
2. Which term refers to the part of an individual's genotypic value that cannot be transmitted to offspring?
  - A. Gene Combination Value
  - B. Gene Combination Effect
  - C. Breeding Value
  - D. Dominance
  
3. What selection method involves focusing on one trait before moving to the next?
  - A. Sequential Selection
  - B. Tandem Selection
  - C. Mixed Trait Selection
  - D. Parallel Selection
  
4. What is the heritability of mature weight in sheep?
  - A. High
  - B. Moderate
  - C. Low
  - D. Very high
  
5. Is it more effective to conduct a test mating for traits exhibiting complete dominance or incomplete dominance?
  - A. Complete dominance
  - B. Incomplete dominance
  - C. Both are equally effective
  - D. Neither are effective

6. What term describes the amount of variation in breeding values within a population for a given trait under selection?
- A. Genetic Trend
  - B. Selection Differential
  - C. Genetic Variation
  - D. Selection Criterion
7. What characteristic of tenderness is typically associated with beef cattle?
- A. Low
  - B. Moderate
  - C. High
  - D. Variable
8. Which of the following factors is typically rated as moderate in dairy cattle?
- A. Protein percent
  - B. Fat percent
  - C. Conformation
  - D. All of the above
9. How is the cannon bone circumference typically characterized in horses?
- A. High
  - B. Moderate
  - C. Very Low
  - D. Low
10. What is an EPD and the associated accuracy for an animal with progeny data referred to as?
- A. Parent EPD
  - B. Non-Parent EPD
  - C. Pedigree Estimated EPD
  - D. Selection Differential

## Answers

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

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## Explanations

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1. What is one effect of high progeny equivalency in a breeding program?

- A. Increased variance in offspring traits
- B. Reduced need for offspring testing
- C. Higher genetic stability and accuracy
- D. Improvement in phenotypic variance

High progeny equivalency in a breeding program indicates that there is a strong matching between the genetic potential of the parents and the traits observed in the offspring. This strong alignment leads to greater genetic stability, as the offspring are more likely to consistently express desirable traits that meet the breeding objectives set forth by the program. When progeny equivalency is high, it also implies that the genetic contributions of the parents are readily apparent, allowing for a more accurate selection of offspring. This reduces uncertainty in predicting how offspring will perform, which is essential in breeding strategies aimed at improving specific traits such as yield, disease resistance, or other economically important characteristics. In contrast, high variance in offspring traits or phenotypic variance would indicate more unpredictability in trait expression, which is not ideal when striving for consistency in a breeding program. Similarly, while reduced need for offspring testing might seem appealing, it does not necessarily correlate with the overall goals of achieving high-quality, predictable outcomes in breeding. Therefore, the impact of high progeny equivalency is most significantly reflected in higher genetic stability and accuracy, making this the correct choice.

2. Which term refers to the part of an individual's genotypic value that cannot be transmitted to offspring?

- A. Gene Combination Value
- B. Gene Combination Effect
- C. Breeding Value
- D. Dominance

The term that refers to the part of an individual's genotypic value that cannot be transmitted to offspring is the Gene Combination Value. This concept relates to the non-additive genetic variance, which arises from the interactions among alleles at different loci. Unlike the breeding value, which is the additive component that can be passed on to offspring, the Gene Combination Value represents the unique combinations and interactions of alleles that contribute to an individual's traits but are not inherited. Understanding Gene Combination Value is crucial in breeding and genetics because it highlights the limitations of genetic transmission. While breeding value helps predict the potential genetic contributions to the next generation, Gene Combination Value emphasizes that not all aspects of an individual's genotype will influence the phenotype of its progeny. This distinction is important for breeders in selecting parent individuals based on the desirable traits they wish to propagate within future generations.

3. What selection method involves focusing on one trait before moving to the next?

- A. Sequential Selection
- B. Tandem Selection
- C. Mixed Trait Selection
- D. Parallel Selection

Tandem selection is the method that involves focusing on one specific trait before addressing the next. This approach prioritizes the improvement of traits sequentially rather than simultaneously. By concentrating on one trait, breeders can optimize that particular characteristic effectively before progressing to another, ensuring each trait is given the necessary attention for improvement. Tandem selection is particularly useful when genetic resources or time are limited, allowing for targeted advancements within a breeding program. In contrast, other methods such as sequential selection and parallel selection involve different strategies for managing multiple traits simultaneously or in a more integrated manner, while mixed trait selection refers to assessing traits together without a priority sequence. Thus, tandem selection stands out for its focused approach to trait enhancement.

4. What is the heritability of mature weight in sheep?

- A. High
- B. Moderate
- C. Low
- D. Very high

The heritability of a trait refers to the proportion of observed variation in a trait among individuals in a population that can be attributed to genetic differences. In livestock, traits with moderate heritability indicate that both genetics and environment play significant roles in expressing that trait. For mature weight in sheep, studies have consistently shown that it has a moderate heritability. This means that while breeding can influence mature weight through selective breeding practices, environmental factors such as nutrition, management, and health also significantly contribute to the final weight attained by the sheep. Choosing this option highlights an understanding of the interplay between genetics and environment in animal breeding, which is crucial for making informed breeding decisions aimed at improving traits like mature weight. High heritability traits would suggest a stronger genetic influence and less environmental impact, while low heritability traits indicate that environmental factors dominate, neither of which accurately describes mature weight in sheep.

5. Is it more effective to conduct a test mating for traits exhibiting complete dominance or incomplete dominance?

- A. Complete dominance
- B. Incomplete dominance
- C. Both are equally effective
- D. Neither are effective

Conducting a test mating for traits exhibiting complete dominance is indeed more effective because, in complete dominance, the phenotype of the dominant allele completely masks the effect of the recessive allele in heterozygous individuals. This means that if you perform a test cross between a homozygous recessive individual and a heterozygous individual (the one with the expressed trait), the offspring will clearly show the dominant trait or the recessive trait. In the case of complete dominance, if any offspring express the dominant phenotype, you can immediately deduce that the tested individual is heterozygous. If all offspring display the recessive phenotype, then the tested individual must be homozygous for the dominant allele. This clear-cut outcome makes it easier to identify the genotype. On the other hand, in traits exhibiting incomplete dominance, the heterozygous phenotype is a blend of both alleles, which complicates the determination of the genotype. The intermediate phenotype can obscure the genetic contributions of the alleles, making it less straightforward to ascertain whether the parent was homozygous or heterozygous. Due to these factors, test matings are more efficient and provide more conclusive results when dealing with traits that display complete dominance.

6. What term describes the amount of variation in breeding values within a population for a given trait under selection?

- A. Genetic Trend
- B. Selection Differential
- C. Genetic Variation
- D. Selection Criterion

The term that describes the amount of variation in breeding values within a population for a given trait under selection is known as genetic variation. Genetic variation refers to the differences in genetic makeup among individuals within a population, which contributes to the variability in traits expressed. This variation is essential for effective breeding programs because it provides the raw material needed for selection. Without sufficient genetic variation, there would be limited potential for improvement in traits since there wouldn't be a range of genetic options to choose from. In breeding contexts, genetic variation allows breeders to identify and select individuals with favorable traits, which can then be propagated to enhance those traits in future generations. The presence of this variation is crucial for successful genetic improvement and the adaptability of populations over time. Other concepts like genetic trend, selection differential, and selection criterion pertain to processes and methodologies used in breeding, but they do not define the inherent diversity in breeding values across the population for a particular trait.

7. What characteristic of tenderness is typically associated with beef cattle?

- A. Low
- B. Moderate
- C. High
- D. Variable

The characteristic of tenderness that is typically associated with beef cattle is high. Tenderness in beef refers to the ease with which the meat can be cut and chewed, a quality that is significant in influencing consumer preference and satisfaction. Various factors affect the tenderness of beef, including the breed of the cattle, their age at slaughter, the quality of their diet, and how the meat is processed post-slaughter. In beef cattle, certain breeds are genetically predisposed to produce more tender meat due to factors such as muscle fiber structure, fat deposition, and the marbling of the meat. Higher levels of intramuscular fat (or marbling) can enhance the perception of tenderness, making the meat juicier and more flavorful. As such, certain beef cattle breeds, which are selectively bred for these traits, tend to yield meat that is consistently rated as high in tenderness, thereby making them preferred for various culinary applications. Choosing high as the correct answer reflects the understanding that, in the context of beef production, achieving tenderness is a primary goal, with many breeding programs focusing on genetic traits that will provide the highest quality beef.

8. Which of the following factors is typically rated as moderate in dairy cattle?

- A. Protein percent
- B. Fat percent
- C. Conformation
- D. All of the above

The concept of rating dairy cattle factors as moderate involves recognizing how these traits are evaluated and their importance in overall herd performance. In dairy cattle, both protein and fat percentages are significant for milk composition and thus have direct implications on profitability and product quality. However, conformation also plays a crucial role, affecting not only the cow's productivity but also its longevity and ability to move efficiently, impacting overall herd health. When we consider these traits together, it's evident that they all typically receive moderate ratings in breeding programs. This is because while each factor is important, none stands out as the sole determinant of a cow's overall value or effectiveness as a dairy producer. Instead, a combination of these traits allows breeders to aim for balanced improvements in dairy cattle, leading to better health, productivity, and efficiency in their operations. This comprehensive approach is essential in the context of dairy breeding, where no single trait can define a successful dairy animal. By viewing protein percent, fat percent, and conformation as moderate, breeders can prioritize the development of cattle that excel in various interconnected traits, leading to sustainable dairy production systems. Thus, all three factors are viewed collectively to establish a holistic breeding strategy.

9. How is the cannon bone circumference typically characterized in horses?

- A. High
- B. Moderate
- C. Very Low
- D. Low

The characterization of cannon bone circumference in horses is typically described as high due to its correlation with the overall strength and soundness of the horse's legs. A strong cannon bone is essential for bearing weight and absorbing shock, thereby playing a crucial role in the horse's athletic performance and longevity. In various breeds and types of horses, a thicker cannon bone often indicates a robust skeletal structure, which can be beneficial for competitive activities and reducing the risk of injury. While the other options may be considered in specific contexts, they do not accurately reflect the typical expectation for cannon bone circumference, which is generally regarded as high for performance horses, thereby providing the necessary support and durability for rigorous work and athletic endeavors.

10. What is an EPD and the associated accuracy for an animal with progeny data referred to as?

- A. Parent EPD
- B. Non-Parent EPD
- C. Pedigree Estimated EPD
- D. Selection Differential

An EPD, or Expected Progeny Difference, is a genetic prediction used in animal breeding that estimates the genetic potential of an animal's offspring. When an EPD is calculated for an animal that has progeny data, it signifies greater confidence in the accuracy of the estimate because it is based on actual performance records from the offspring. This leads to a more reliable prediction of what an animal will contribute genetically to its progeny. The term "Parent EPD" refers specifically to EPDs derived from parents that have offspring data available, enhancing the level of accuracy due to real-world performance indicators. This allows breeders to make informed decisions based on the expected traits that those animals will pass on to their offspring. In contrast, other options focus on different aspects of EPDs or genetic evaluation. For instance, a "Non-Parent EPD" would apply to animals without progeny records, thus being less reliable. "Pedigree Estimated EPD" suggests an estimate based solely on ancestry rather than on performance data. "Selection Differential" refers to the difference in performance between selected individuals and the overall population, which does not pertain directly to the accuracy of EPDs derived from progeny data.

## Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at [hello@examzify.com](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

<https://breedinggenetics2.examzify.com>

We wish you the very best on your exam journey. You've got this!

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