BREEDING AND GENETICS EXAM 2 PRACTICE (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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.

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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!

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Questions

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1. What does ETA stand for in the context of genetics?

A. Expected Transmitting Ability

B. Estimated Trait Analysis

C. Effective Transmission Assessment

D. Estimated Transferable Ability

2. What role does progeny equivalency play in evaluating breeding success?

A. It focuses only on economic returns.

B. It assesses reproductive performance.

C. It predicts genetic contributions accurately.

D. It is unrelated to breeding outcomes.

3. What is the typical pulling power level seen in horses?

A. High

B. Low

C. Very High

D. Moderate

4. Heritability in the narrow sense is represented by which symbol?

A. h

B. H^2

C. h^2

D. H

5. What is the characteristic of feed efficiency in swine?

A. High

B. Low

C. Moderate

D. Very High

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

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7. What term describes the number of progeny a sire must have to match the accuracy of DNA testing?

A. Progeny equivalency

B. Genetic measurement

C. Progeny analysis

D. Testing accuracy

8. What does H2 represent in genetics?

A. Heritability in Broad Sense

B. Hereditary Transmission Index

C. Hyperbolic Trait Analysis

D. Hereditary Measure

9. Which trait is considered to have high heritability in beef cattle?

A. Birth weight

B. Calving interval

C. Scrotal circumference

D. Weaning weight

10. What is classified as a moderate run time for horses over one mile?

A. Under 5 minutes

B. Under 8 minutes

C. Under 12 minutes

D. Under 10 minutes

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Answers

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

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Explanations

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1. What does ETA stand for in the context of genetics?

A. Expected Transmitting Ability

B. Estimated Trait Analysis

C. Effective Transmission Assessment

D. Estimated Transferable Ability

ETA stands for Expected Transmitting Ability in the context of genetics. This term refers to a genetic evaluation metric used to predict the genetic potential of an animal, particularly in breeding programs. It quantifies the expected genetic contribution that an individual can pass on to its offspring, typically based on pedigree information, performance data, and genetic markers. This assessment assists breeders in making informed decisions to enhance desirable traits within a population, such as growth rates, milk production, or disease resistance. The use of ETA is crucial in livestock and crop breeding as it helps in selecting individuals that can effectively transmit their favorable traits to the next generation, ultimately improving the overall quality and productivity of the herd or crop variety. Understanding ETA allows breeders to optimize genetic gain over time by focusing on individuals that have higher transmission abilities, contributing to more efficient and effective breeding strategies.

2. What role does progeny equivalency play in evaluating breeding success?

A. It focuses only on economic returns.

B. It assesses reproductive performance.

C. It predicts genetic contributions accurately.

D. It is unrelated to breeding outcomes.

Progeny equivalency is a crucial concept in evaluating breeding success, as it helps to predict genetic contributions accurately. This principle involves comparing the performance of progeny (offspring) against established benchmarks or expectations, allowing breeders to assess how well their breeding programs are producing individuals that meet desired genetic traits. By using progeny equivalency, breeders can determine the effectiveness of their selection strategies and the overall genetic potential of the breeding individuals. This assessment is particularly valuable because it helps in making informed decisions about which animals to retain for breeding and the direction of future breeding programs. The focus on genetic contributions ensures that breeding practices lead to improvements in traits that are economically or biologically significant, thereby enhancing the sustainability and profitability of breeding endeavors. The other options, while mentioning relevant aspects of breeding, do not summarize the essential function of progeny equivalency as clearly. Focusing solely on economic returns overlooks the multifaceted nature of breeding success, while assessing reproductive performance is a narrower aspect that does not encompass genetic predictions. Additionally, stating that progeny equivalency is unrelated to breeding outcomes misses its foundational role in understanding and improving genetic traits in successive generations.

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3. What is the typical pulling power level seen in horses?

A. High

B. Low

C. Very High

D. Moderate

The typical pulling power level seen in horses is considered to be moderate. This is due to the anatomical and physiological characteristics of horses that allow them to exert significant force without overwhelming strain. Horses have a well-developed muscular system and skeletal structure that enables them to effectively pull loads, whether in the context of work, agriculture, or recreational activities. Moderate pulling power also reflects the balance between a horse's abilities and the workload they can handle without risking injury or fatigue. Additionally, factors such as breed, training, and conditioning play a substantial role in a horse's pulling capability. While some horses may exhibit higher levels of pulling power depending on their size and muscling, the general consensus is that they possess a moderate capacity that aligns well with their roles in various equine disciplines.

4. Heritability in the narrow sense is represented by which symbol?

A. h

B. H^2

C. h^2

D. H

Heritability in the narrow sense, which quantifies the proportion of phenotypic variance in a trait that is attributable to additive genetic variance, is represented by the symbol h^2. This symbol specifically indicates the measurement of how much of the trait's variation is inherited, allowing researchers to predict outcomes in breeding and genetics. The use of h^2 is important because it focuses on the additive effects of alleles, which can be crucial when considering traits that are influenced by multiple genes. This additive genetic variance is what drives responses to selection in breeding programs. In contrast, H^2, often used to denote broad-sense heritability, includes all genetic variances, encompassing additive, dominance, and epistatic effects. The distinction between narrow-sense and broad-sense heritability is fundamental in genetics, particularly when the goal is to improve specific traits through selective breeding. The other options simply do not represent the concept of narrow-sense heritability accurately.

5. What is the characteristic of feed efficiency in swine?

A. High

B. Low

C. Moderate

D. Very High

Feed efficiency in swine is primarily a measure of how well the animals convert feed into body weight gain. Swine are generally bred and selected for traits that enhance their ability to efficiently utilize feed, leading to optimized growth rates and body composition. The characteristic of feed efficiency often observed in swine is considered moderate because while swine can efficiently convert feed to gain, there are limits to this efficiency based on factors such as genetics, nutrition, health, and environmental conditions. High efficiency is desirable but not always attainable due to these varying influences. Therefore, describing swine feed efficiency as moderate acknowledges the balance between optimal growth rates and the biological limitations of nutrient utilization. Understanding this characteristic is critical for producers who aim to improve production economics while ensuring animal welfare and meeting market demands.

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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 term describes the number of progeny a sire must have to match the accuracy of DNA testing?

A. Progeny equivalency

B. Genetic measurement

C. Progeny analysis

D. Testing accuracy

The term that describes the number of progeny a sire must have to match the accuracy of DNA testing is progeny equivalency. This concept emphasizes the relationship between the number of offspring a sire produces and the level of confidence or accuracy in assessing its genetic value. Progeny equivalency illustrates that as a sire covers a greater number of progeny, the estimates of genetic merit become more reliable. This is particularly relevant in breeding and genetics, where precise evaluation of a sire's genetic potential is crucial for selection and breeding decisions. It underscores the importance of combining traditional performance data with modern genetic technologies, such as DNA testing, to achieve the most accurate evaluations of a sire's capabilities. In contrast, the other terms do not specifically capture the concept of matching progeny numbers with the accuracy of genetic assessments. While genetic measurement relates generally to evaluating genetic traits, progeny analysis focuses on studying the characteristics of offspring but does not necessarily correlate with the accuracy of sire evaluations through DNA. Testing accuracy pertains to the reliability of different forms of genetic testing rather than the specific relationship with progeny numbers. Thus, progeny equivalency is the most fitting term for the context of this question.

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8. What does H2 represent in genetics?

A. Heritability in Broad Sense

B. Hereditary Transmission Index

C. Hyperbolic Trait Analysis

D. Hereditary Measure

H2 represents Heritability in Broad Sense in genetics. This concept is fundamental in the study of quantitative traits, as it quantifies the proportion of phenotypic variance in a trait that can be attributed to genetic variance. Heritability in the broad sense takes into account all genetic contributions, including additive, dominance, and interaction effects among alleles. This measure helps researchers understand the extent to which a trait can be influenced by genetic factors versus environmental influences, which is crucial for breeding programs and evolutionary biology. By calculating broad-sense heritability, scientists can make predictions about how traits may be passed on to future generations, thus informing selection strategies in breeding practices.

9. Which trait is considered to have high heritability in beef cattle?

A. Birth weight

B. Calving interval

C. Scrotal circumference

D. Weaning weight

High heritability refers to the extent to which genetic factors influence a trait within a population. In the context of beef cattle, when we examine traits that are typically considered to have high heritability, scrotal circumference stands out. This trait is largely influenced by genetics and can significantly affect reproduction and fertility in bulls, making it a trait that breeders can reliably select for when aiming to improve genetic traits in a herd. Scrotal circumference is an important criterion because it is associated with the production of sperm and consequently influences the fertility of the offspring. Since it is primarily controlled by genetic factors, breeders can expect more consistent results when they make selections based on this trait. While traits like birth weight, calving interval, and weaning weight also have genetic influences, they tend to be affected by more environmental factors and management practices, which can dilute their heritable components. For instance, birth weight can be influenced by the mother's nutrition and health, calving interval can be affected by management practices, and weaning weight is subject to both genetics and the environment, such as pasture quality and rearing conditions. Hence, scrotal circumference is recognized as a trait that exhibits high heritability in the context of beef cattle breeding.

10. What is classified as a moderate run time for horses over one mile?

A. Under 5 minutes

B. Under 8 minutes

C. Under 12 minutes

D. Under 10 minutes

A moderate run time for horses over one mile is categorized as under 12 minutes. This classification recognizes the average capabilities of thoroughbred racehorses, which typically complete distances of one mile in shorter times, often around 1.5 to 2 minutes or so in competitive racing conditions. Therefore, the option stating under 12 minutes encompasses a wide range of moderate performance times for horses, distinguishing them from faster sprint times while still acknowledging they can run a mile without extremely taxing their endurance. Longer completion times, such as under 10 minutes or under 8 minutes, suggest a significantly different level of performance that would typically not be categorized as moderate for competitive horses. Thus, under 12 minutes provides a more realistic measure for what could be considered moderate in terms of general expectations for such distances in equestrian sport.

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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.

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

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

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