

HOSA Human Heredity Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

This is a sample study guide. To access the full version with hundreds of 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.

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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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

- 1. What is the function of the enzyme DNA polymerase?**
 - A. To synthesize new DNA strands during replication**
 - B. To unwind the DNA double helix**
 - C. To repair damaged DNA**
 - D. To bind RNA primers to DNA**
- 2. What is the expected phenotype ratio of a dihybrid cross?**
 - A. 3:1**
 - B. 1:1:1:1**
 - C. 9:3:3:1**
 - D. 1:2:1**
- 3. What is DNA primarily responsible for in living organisms?**
 - A. Energy production**
 - B. Catalyzing reactions**
 - C. Storing genetic information**
 - D. Transporting molecules**
- 4. What does Mendel's Law of Independent Assortment state?**
 - A. Each trait is inherited independently of other traits**
 - B. Traits can blend together in offspring**
 - C. All genes on a chromosome are inherited together**
 - D. Recessive traits are always masked by dominant traits**
- 5. Which term refers to the unique characteristics found in an individual's DNA?**
 - A. DNA sequencing**
 - B. DNA fingerprinting**
 - C. DNA mapping**
 - D. Genetic testing**
- 6. What term refers to the specific location of a gene on a chromosome?**
 - A. Allele**
 - B. Gene pool**
 - C. Locus**
 - D. Karyotype**

- 7. What term describes the absence of one chromosome from a pair?**
- A. Trisomy**
 - B. Monosomy**
 - C. Euploidy**
 - D. Polyploidy**
- 8. What does penetrance refer to in genetics?**
- A. Variation in genotype**
 - B. Observable traits influenced by genotype**
 - C. Proportion of individuals with a specific genotype expressing the phenotype**
 - D. Sequence alignment among alleles**
- 9. What is the effect of a mutation in a gene?**
- A. It always results in a beneficial outcome**
 - B. It may alter the function of a protein produced by the gene**
 - C. It guarantees the organism will have an advantage**
 - D. It is always harmful to the organism**
- 10. What is a sequence of three nucleotides in mRNA that codes for one amino acid called?**
- A. Codon**
 - B. Anticodon**
 - C. Gene**
 - D. Exon**

Answers

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

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Explanations

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1. What is the function of the enzyme DNA polymerase?

A. To synthesize new DNA strands during replication

B. To unwind the DNA double helix

C. To repair damaged DNA

D. To bind RNA primers to DNA

DNA polymerase plays a crucial role in the process of DNA replication. Its primary function is to synthesize new DNA strands by adding nucleotides to a pre-existing chain during the replication of DNA. This enzyme works by attaching to a template strand of DNA and catalyzing the formation of new complementary strands, effectively elongating the DNA molecule. During DNA replication, DNA polymerase also ensures that the new DNA strands are complementary to the original template strands, maintaining the accuracy needed for proper genetic information transfer. This is essential for cell division, as each new cell must receive an exact copy of the organism's genome. While other enzymes and proteins participate in the replication process, such as helicase, which unwinds the DNA double helix, and ligase, which joins Okazaki fragments on the lagging strand, none perform the specific function of synthesizing the new DNA strands like DNA polymerase does.

2. What is the expected phenotype ratio of a dihybrid cross?

A. 3:1

B. 1:1:1:1

C. 9:3:3:1

D. 1:2:1

The expected phenotype ratio of a dihybrid cross, which involves two traits that are each controlled by two alleles, is 9:3:3:1. This ratio results from the combination of possible allele pairs from each parent during gamete formation and subsequent fertilization. In a classic dihybrid cross, where individuals are heterozygous for two traits (for example, AaBb x AaBb), the resulting offspring will express four distinct phenotypic categories based on the combinations of dominant and recessive alleles for each trait. The 9:3:3:1 ratio specifically represents the predicted proportions of these phenotypes: - Nine offspring exhibiting both dominant traits, - Three offspring exhibiting the dominant trait for the first gene and the recessive trait for the second gene, - Three offspring exhibiting the recessive trait for the first gene and the dominant trait for the second gene, and - One offspring exhibiting both recessive traits. This established ratio is a foundational concept in Mendelian genetics and demonstrates the principles of independent assortment, which states that alleles for different traits segregate independently during gamete formation. Understanding this outcome helps in predicting the genetic variations in the offspring from such crosses.

3. What is DNA primarily responsible for in living organisms?

- A. Energy production
- B. Catalyzing reactions
- C. Storing genetic information**
- D. Transporting molecules

DNA is primarily responsible for storing genetic information in living organisms. It contains the instructions needed for an organism's growth, development, functioning, and reproduction. This genetic information is encoded in the sequence of nucleotides within the DNA molecule, which ultimately determines the traits and characteristics of an organism. In the context of heredity, DNA is fundamental because it ensures that the hereditary information is passed down from one generation to the next during reproduction. Each organism's unique genetic code is what allows for the vast diversity of life observed on Earth. Additionally, the information stored in DNA is used to synthesize proteins through processes such as transcription and translation, which are crucial for the organism's cellular functions. The other options, while important functions in biology, do not accurately represent the primary role of DNA. Energy production is primarily handled by mitochondria in eukaryotes, catalyzing reactions is done by enzymes (which are typically proteins produced based on genetic instructions), and transporting molecules often involves different cellular structures and systems, such as membranes and transport proteins. Thus, the role of DNA as the repository of genetic information is central to its function in living organisms.

4. What does Mendel's Law of Independent Assortment state?

- A. Each trait is inherited independently of other traits**
- B. Traits can blend together in offspring
- C. All genes on a chromosome are inherited together
- D. Recessive traits are always masked by dominant traits

Mendel's Law of Independent Assortment states that each trait is inherited independently of other traits. This principle is based on Mendel's experiments with pea plants, where he observed that the inheritance of one trait, such as seed color, did not affect the inheritance of another trait, such as plant height. Independent assortment occurs during the formation of gametes when the alleles for different genes segregate independently from one another. This means that the combination of traits in the offspring is a result of random assortment of maternal and paternal alleles, which contributes to genetic variation within populations. The other options do not accurately reflect Mendel's findings. The blending of traits (as mentioned in one of the other choices) is a concept that contradicts Mendelian genetics, as traits are inherited as discrete units rather than blending. The statement regarding all genes on a chromosome being inherited together relates to linkage, which occurs when genes are located close together on the same chromosome, and thus do not assort independently. Lastly, while recessive traits are masked by dominant traits in a heterozygous condition, this is more accurately described in the context of dominance and recessiveness rather than independent assortment.

5. Which term refers to the unique characteristics found in an individual's DNA?

- A. DNA sequencing**
- B. DNA fingerprinting**
- C. DNA mapping**
- D. Genetic testing**

The term that refers to the unique characteristics found in an individual's DNA is DNA fingerprinting. This method is used to identify individuals based on the distinctive patterns in their DNA. DNA fingerprinting focuses on specific regions in the DNA that vary greatly among individuals. These regions are often non-coding and repeat sequences, which provide a high degree of variability among different people. DNA fingerprinting has significant applications in forensic science, paternity testing, and genetic identity verification. When comparing DNA from different individuals, the unique patterns or "fingerprints" provide a reliable way to differentiate one individual from another. In contrast, DNA sequencing is about determining the exact sequence of nucleotides in a DNA molecule rather than identifying uniqueness compared to others. DNA mapping involves outlining the location of genes on chromosomes, while genetic testing is a broader term that may involve analyzing genes for health-related conditions or genetic diseases, but doesn't directly refer to the unique identification aspect of an individual's DNA.

6. What term refers to the specific location of a gene on a chromosome?

- A. Allele**
- B. Gene pool**
- C. Locus**
- D. Karyotype**

The correct answer is "locus." This term specifically refers to the exact physical location of a gene on a chromosome. Each gene occupies a specific position, or locus, which can be identified within the structure of the chromosome. Understanding the concept of a locus is essential in genetics, as it helps in mapping genes and studying genetic variation and inheritance patterns. While the other terms relate to genetics, they do not accurately describe the location of a gene on a chromosome. An allele refers to a variant form of a gene that can exist at a specific locus. The gene pool represents the total genetic diversity found within a population, while a karyotype is an organized profile of an individual's chromosomes, illustrating their number and structure but not the specific location of genes. Thus, "locus" is the precise term used to denote the gene's position on a chromosome.

7. What term describes the absence of one chromosome from a pair?

- A. Trisomy
- B. Monosomy**
- C. Euploidy
- D. Polyploidy

The term that describes the absence of one chromosome from a pair is monosomy. In humans, this condition results in only one chromosome present instead of the typical two in a pair. Monosomy is often associated with various genetic disorders and can have significant phenotypic consequences. In contrast, trisomy, which is another option, refers to the presence of an extra chromosome, leading to three copies instead of two. Euploidy refers to a complete set of chromosomes being present, while polyploidy denotes a condition where there are more than two complete sets of chromosomes. Both euploidy and polyploidy do not reflect the absence of any chromosome but rather imply an increase in the number of chromosome sets.

8. What does penetrance refer to in genetics?

- A. Variation in genotype
- B. Observable traits influenced by genotype
- C. Proportion of individuals with a specific genotype expressing the phenotype**
- D. Sequence alignment among alleles

Penetrance in genetics refers to the proportion of individuals with a particular genotype who actually express the corresponding phenotype. This concept is important for understanding how genetic traits are inherited and expressed in a population. For instance, a genotype may be responsible for a certain trait, but not all individuals carrying that genotype will show the associated phenotype; this can occur due to various factors including environmental influences and the presence of other modifying genes. The correct choice highlights that while a specific genetic makeup may exist within a population, the expression of that genetic trait can vary. This allows for a more nuanced understanding of genetics beyond simply looking at gene sequencing or genotype alone because it incorporates the actual observable outcomes as they relate to genetic information. Understanding penetrance is vital for fields like genetic counseling and medical genetics, where predicting traits or risks based on genetics is essential.

9. What is the effect of a mutation in a gene?

- A. It always results in a beneficial outcome**
- B. It may alter the function of a protein produced by the gene**
- C. It guarantees the organism will have an advantage**
- D. It is always harmful to the organism**

The effect of a mutation in a gene is often associated with its potential to alter the function of the protein produced by that gene. Mutations can lead to changes in the amino acid sequence of a protein, which may affect its shape and function. Depending on the nature and location of the mutation, the resulting protein may be more active, less active, or entirely nonfunctional. This variability can have diverse implications for the organism, ranging from no observable effect to significant physiological changes. Mutations play a critical role in evolution and genetic diversity, as they can introduce new traits within a population. While some mutations may confer advantages or disadvantages, the key point is that they influence the protein's function, which can cascade into various outcomes based on environmental pressures and interactions within the organism. Thus, option B captures the essence of how mutations can impact gene expression and functionality.

10. What is a sequence of three nucleotides in mRNA that codes for one amino acid called?

- A. Codon**
- B. Anticodon**
- C. Gene**
- D. Exon**

A sequence of three nucleotides in mRNA that codes for one amino acid is called a codon. This term is central to the process of translation in protein synthesis. During this process, ribosomes read the sequence of codons in mRNA to assemble amino acids in the correct order, forming a protein. Each codon corresponds to a specific amino acid or a stop signal during translation, and the genetic code dictates which amino acid is represented by each codon. This specificity is pivotal for the accurate expression of genes and the functioning of living organisms. The other terms refer to different concepts related to genetics and molecular biology. An anticodon is a sequence of three nucleotides in tRNA that is complementary to an mRNA codon and plays a role in matching the correct amino acid to the codon during translation. A gene is a segment of DNA that contains the instructions for making a protein or RNA molecule, while an exon refers to portions of a gene that are transcribed into mRNA and are included in the final mRNA molecule after splicing.

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:

<https://hosahumanheredity.examzify.com>

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