

HOSA Human Heredity Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	16

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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 the term for an organism's ability to survive and reproduce in its environment?**
 - A. Adaptation**
 - B. Selection**
 - C. Fitness**
 - D. Evolution**

- 2. Which genetic disorder is caused by a mutation in the CFTR gene?**
 - A. Sickle cell anemia**
 - B. Duchenne muscular dystrophy**
 - C. Cystic fibrosis**
 - D. Hemophilia**

- 3. What defines the condition known as hemophilia?**
 - A. Excessive bruising and bleeding**
 - B. Muscle degeneration**
 - C. Thick mucus production**
 - D. High blood pressure**

- 4. What type of chromosome is classified as not a sex chromosome?**
 - A. Autosome**
 - B. Sex chromosome**
 - C. Homologous chromosome**
 - D. Centromere**

- 5. What does gene expression refer to?**
 - A. The mutation of genes**
 - B. The replication of DNA**
 - C. The process of using information from a gene to produce a functional product**
 - D. The inheritance of traits**

- 6. Neurofibromatosis primarily causes growth of what type of tumors?**
- A. Malignant tumors**
 - B. Cancerous tumors**
 - C. Non-cancerous tumors**
 - D. Malignant melanomas**
- 7. What term describes the complete set of genetic material within an organism?**
- A. Genome**
 - B. Genotype**
 - C. Karyotype**
 - D. Locus**
- 8. What is the name of the allele that is expressed only when two copies are present?**
- A. Dominant allele**
 - B. Recessive allele**
 - C. Codominant allele**
 - D. Incomplete dominant allele**
- 9. What type of mutation introduces a premature stop codon, truncating the resulting protein?**
- A. Nonsense mutation**
 - B. Missense mutation**
 - C. Silent mutation**
 - D. Substitution mutation**
- 10. What type of mutation shifts the reading frame due to insertion or deletion of nucleotides?**
- A. Point mutation**
 - B. Silent mutation**
 - C. Frameshift mutation**
 - D. Translocation mutation**

Answers

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

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Explanations

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1. What is the term for an organism's ability to survive and reproduce in its environment?

- A. Adaptation**
- B. Selection**
- C. Fitness**
- D. Evolution**

The term describing an organism's ability to survive and reproduce in its environment is referred to as fitness. This concept is central to the theory of natural selection and evolutionary biology. Fitness is not merely about physical strength; instead, it encompasses various traits that enhance an organism's chances of survival and successful reproduction within a specific environment. For example, an organism might possess certain advantageous traits, such as the ability to find food efficiently, evade predators, or withstand environmental stresses. All of these factors contribute to greater reproductive success, meaning that the organism is more likely to pass on its genes to the next generation. Fitness is often measured not only by the number of offspring produced but also by the viability and reproductive capabilities of those offspring. While adaptation, selection, and evolution are related concepts within this context, they do not define the specific ability to thrive and reproduce as accurately as fitness does. Adaptation refers to the process through which organisms evolve traits that improve their survival chances in response to environmental pressures, selection pertains more to the mechanisms driving changes in populations over time, and evolution describes the broader changes in species and populations across generations. Therefore, fitness is the most precise term to encapsulate the essence of survival and reproduction within a given environment.

2. Which genetic disorder is caused by a mutation in the CFTR gene?

- A. Sickle cell anemia**
- B. Duchenne muscular dystrophy**
- C. Cystic fibrosis**
- D. Hemophilia**

Cystic fibrosis is directly caused by a mutation in the CFTR gene, which plays a crucial role in regulating the movement of salt and water in and out of the cells. This gene encodes a protein called cystic fibrosis transmembrane conductance regulator, important for maintaining the balance of sweat, digestive juices, and mucus. When mutations occur in the CFTR gene, it can lead to the production of a faulty protein that results in thick, sticky mucus buildup in various organs, primarily affecting the lungs and the digestive system. This can cause severe respiratory issues, difficulty in digestion, and increased risk of infections, which are hallmark symptoms of cystic fibrosis. The other options represent different genetic disorders that arise from mutations in different genes, unrelated to the CFTR gene. For example, sickle cell anemia is caused by a mutation in the HBB gene, Duchenne muscular dystrophy is linked to mutations in the DMD gene, and hemophilia results from mutations in genes that affect blood clotting factors. Each of these disorders has distinct genetic causes and associated symptoms, further underscoring why cystic fibrosis is uniquely connected to the CFTR gene.

3. What defines the condition known as hemophilia?

A. Excessive bruising and bleeding

B. Muscle degeneration

C. Thick mucus production

D. High blood pressure

Hemophilia is a genetic disorder that specifically affects the body's ability to clot blood. The defining feature of hemophilia is the tendency to experience excessive bruising and prolonged bleeding even from minor injuries. This occurs due to deficiencies in specific clotting factors, which are proteins essential for the blood clotting process. When these factors are lacking or dysfunctional, the normal mechanism that stops bleeding is impaired, leading to spontaneous bleeding (often into joints and muscles) and difficulty in controlling bleeding during injury. The other conditions mentioned, such as muscle degeneration, thick mucus production, and high blood pressure, are unrelated to hemophilia and describe completely different medical issues. Muscle degeneration is associated with disorders affecting muscle tissue, thick mucus production is characteristic of conditions like cystic fibrosis, and high blood pressure relates to cardiovascular health rather than coagulation. Thus, the hallmark symptoms of hemophilia are indeed excessive bruising and bleeding, making this the correct answer.

4. What type of chromosome is classified as not a sex chromosome?

A. Autosome

B. Sex chromosome

C. Homologous chromosome

D. Centromere

Autosomes are the chromosomes that are not directly involved in determining the sex of an individual. In humans, there are a total of 22 pairs of autosomes, which are identical in males and females. They carry most of the genetic information related to an individual's traits and characteristics. In contrast, sex chromosomes are specifically the chromosomes that determine the sex of an individual, such as the X and Y chromosomes in humans. While homologous chromosomes refer to pairs of chromosomes that have the same gene sequences but may have different alleles, this term does not specify whether the chromosomes are sex chromosomes or autosomes. A centromere is a part of a chromosome that links sister chromatids, but it is not a classification of a chromosome itself. Thus, the classification of autosomes as non-sex chromosomes is a fundamental concept in genetics.

5. What does gene expression refer to?

- A. The mutation of genes**
- B. The replication of DNA**
- C. The process of using information from a gene to produce a functional product**
- D. The inheritance of traits**

Gene expression specifically refers to the process by which information from a gene is utilized to synthesize a functional product, typically a protein. This process involves multiple stages, including transcription, where the DNA sequence of a gene is transcribed into messenger RNA (mRNA), and translation, where that mRNA is then used as a template to assemble amino acids into a protein. The functional products of gene expression are crucial for various cellular processes and determine the characteristics of an organism. Understanding gene expression is fundamental because it links the genetic information encoded in DNA to the phenotypic traits observed in an organism. It is through this process that protein synthesis occurs, leading to the functioning of cells and ultimately the entire organism.

6. Neurofibromatosis primarily causes growth of what type of tumors?

- A. Malignant tumors**
- B. Cancerous tumors**
- C. Non-cancerous tumors**
- D. Malignant melanomas**

Neurofibromatosis primarily causes growth of non-cancerous tumors, specifically neurofibromas. This genetic disorder affects the nervous system and is characterized by the development of these benign tumors that arise from nerve tissues. Neurofibromas can appear on or under the skin, along nerves, or in various other locations in the body. While they can cause complications depending on their size and location, they are generally not malignant, meaning they do not invade surrounding tissues or spread to other parts of the body like cancerous tumors. The focus on non-cancerous tumors is vital because it highlights the significant distinction between benign and malignant growths, as neurofibromatosis is fundamentally a disorder characterized by benign tumor formation rather than cancerous growth. Thus, the recognition of the type of tumors associated with neurofibromatosis is essential for understanding the implications of the disorder and its management.

7. What term describes the complete set of genetic material within an organism?

- A. Genome**
- B. Genotype**
- C. Karyotype**
- D. Locus**

The term that describes the complete set of genetic material within an organism is "genome." A genome encompasses all of an organism's DNA, including its genes and the non-coding sequences of DNA. It provides the comprehensive information necessary for the growth, development, and functioning of that organism. In contrast, "genotype" refers specifically to the genetic makeup of an individual, usually concerning a particular trait, rather than the entire set of genetic material. "Karyotype" describes the number and appearance of chromosomes in the nucleus of a eukaryotic cell, which is a part of the genome but does not represent the complete set. "Locus" denotes a specific location or position of a gene on a chromosome, which is just a small component of the overall genome. Understanding these distinctions clarifies why the complete set of genetic material is specifically identified as the genome.

8. What is the name of the allele that is expressed only when two copies are present?

- A. Dominant allele**
- B. Recessive allele**
- C. Codominant allele**
- D. Incomplete dominant allele**

The allele that is expressed only when two copies are present is known as a recessive allele. This type of allele requires both copies—one from each parent—to manifest its trait in the phenotype of an organism. For example, if a trait is controlled by a recessive allele, an individual must inherit this allele from both parents in order for the trait to be expressed. In cases where an individual has only one copy of the recessive allele, the dominant allele (if present) will mask the effect of the recessive allele, preventing its expression. In contrast, dominant alleles are those that can express a trait even when only one copy is present. Codominant alleles lead to both traits being expressed simultaneously in the phenotype. Incomplete dominance results in a blending of traits rather than one trait dominating over the other. The distinction of recessive alleles is fundamental to understanding inheritance patterns and how traits are passed from one generation to the next.

9. What type of mutation introduces a premature stop codon, truncating the resulting protein?

- A. Nonsense mutation**
- B. Missense mutation**
- C. Silent mutation**
- D. Substitution mutation**

A nonsense mutation is a type of mutation that results in a premature stop codon in the genetic code of an organism. This occurs because one of the nucleotides in the DNA sequence changes, leading to the substitution of a single amino acid for a stop signal during protein synthesis. As a result, the translation process is terminated early, creating a truncated protein that is often nonfunctional or has reduced functionality compared to the full-length version. This can have significant implications for the organism's phenotype, affecting traits and potentially leading to disease. In contrast, a missense mutation changes one amino acid in the protein but does not introduce a stop codon, while a silent mutation does not change the amino acid sequence at all, leaving the protein unchanged. A substitution mutation refers to the replacement of one base pair with another, which can lead to various effects, including nonsense mutations, but not all substitutions result in a premature stop codon. Thus, the key characteristic of a nonsense mutation is its ability to produce a stop codon, truncating the protein and affecting its function.

10. What type of mutation shifts the reading frame due to insertion or deletion of nucleotides?

- A. Point mutation**
- B. Silent mutation**
- C. Frameshift mutation**
- D. Translocation mutation**

A frameshift mutation occurs when the addition or deletion of nucleotides in a DNA sequence alters the way the sequence is read by shifting the reading frame. This is significant because the genetic code is read in triplets, or codons, each of which corresponds to a specific amino acid. When nucleotides are inserted or deleted, not only does the original codon change, but subsequent codons are also affected, potentially resulting in a completely different amino acid sequence from that point forward. This can lead to substantial functional changes in the protein that is produced, potentially resulting in diseases or malfunctions if critical proteins are altered. The other types of mutations listed do not cause a shift in the reading frame. Point mutations involve a change in a single nucleotide, silent mutations change a nucleotide without altering the amino acid sequence, and translocation mutations involve the movement of segments of DNA between non-homologous chromosomes, but do not typically cause a direct frameshift in the reading sequence of a gene.

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!

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