NMAT Biology Practice Test (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

1. What process begins at puberty and results in four viable sperm cells per parent cell?

A. Oogenesis

B. Spermatogenesis

C. Folliculogenesis

D. Gametogenesis

2. Which organelle is involved in breaking down fatty acids and detoxifying harmful substances?

A. Peroxisomes

B. Central vacuole

C. Myosin

D. Actin

3. During which prophase I phase does synapsis complete?

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

4. Which hormone is also referred to as the 'love hormone' due to its role in childbirth and lactation?

A. Oxytocin

B. Norepinephrine

C. ADH

D. Dopamine

5. Which organelle is primarily responsible for synthesizing proteins and repairing the plasma membrane?

A. Rough ER

B. Lysosomes

C. Peroxisomes

D. Centriole

6. Which organelle is primarily responsible for the storage and breakdown of waste in plant cells?

A. Peroxisomes

B. Central vacuole

C. Rough ER

D. Centriole

7. Which plant hormone primarily regulates phototropism?

A. Ethylene

B. Abscisic Acid

C. Gibberellin

D. Auxin

8. What is the function of cytokinin in plants?

A. Thirsty signal

B. Cell division for new plant organs

C. Ripening and rotting

D. Stem elongation

9. What role does the hormone oxytocin play in the body?

A. Promotes growth

B. Stimulates lactation and childbirth

C. Regulates calcium levels

D. Affects blood glucose levels

10. In which mode of inheritance do neither parent's traits dominate, resulting in blended traits?

A. Codominance

B. Incomplete dominance

C. Mendelian inheritance

D. Polygenic inheritance

Answers

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

Explanations

1. What process begins at puberty and results in four viable sperm cells per parent cell?

A. Oogenesis

B. Spermatogenesis

C. Folliculogenesis

D. Gametogenesis

The process that begins at puberty and results in four viable sperm cells per parent cell is spermatogenesis. This is a specialized form of gametogenesis specifically related to the formation of sperm cells in males. Spermatogenesis takes place in the seminiferous tubules of the testes and involves a series of stages where spermatogonia (the initial germ cells) undergo mitotic and meiotic divisions. Starting from one diploid spermatogonia, the process ultimately leads to the production of four haploid sperm cells, ensuring genetic diversity and the capability for fertilization. During puberty, there is an increase in hormone levels, particularly testosterone, which triggers the onset of active spermatogenesis. The production of sperm cells continues throughout a male's life, in contrast to oogenesis in females, which results in a limited number of eggs (ova). Other options pertain to different processes. Oogenesis is related to egg formation and typically results in one viable egg and polar bodies, while folliculogenesis pertains specifically to the development of ovarian follicles. Gametogenesis is a broader term that encompasses both spermatogenesis and oogenesis, but it does not specifically address the formation of sperm cells.

2. Which organelle is involved in breaking down fatty acids and detoxifying harmful substances?

A. Peroxisomes

B. Central vacuole

C. Myosin

D. Actin

Peroxisomes are organelles that play a crucial role in lipid metabolism, specifically in the breakdown of fatty acids through a process known as β-oxidation. Additionally, peroxisomes are involved in the detoxification of various harmful substances, including hydrogen peroxide, which they convert into water and oxygen using the enzyme catalase. This detoxification process is essential for maintaining cellular health and protecting against oxidative stress. The central vacuole primarily serves functions related to storage and maintaining turgor pressure in plant cells, rather than breaking down fatty acids or detoxifying substances. Myosin and actin are proteins that are essential for muscle contraction and cellular movements but are not involved in metabolic processes like fatty acid breakdown or detoxification.

3. During which prophase I phase does synapsis complete?

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

Synapsis is the process during prophase I of meiosis where homologous chromosomes pair up and become closely associated. This pairing is crucial for the exchange of genetic material through a process called crossing over. In the context of prophase I, synapsis reaches completion during the pachytene stage. During the zygotene phase, the homologous chromosomes start to pair up, but it is during the pachytene phase that this process is fully realized. Each paired set of chromosomes is known as a tetrad, which consists of two homologous chromosomes, each made up of two sister chromatids. The completion of synapsis in pachytene allows for the formation of structures called chiasmata, where crossing over occurs, leading to genetic variation in the resulting gametes. This is why the correct answer is pachytene. It is the stage where the chromosomes have maximally paired and genetic recombination is prepared to occur, setting the stage for further processes that lead to the eventual formation of gametes.

4. Which hormone is also referred to as the 'love hormone' due to its role in childbirth and lactation?

A. Oxytocin

B. Norepinephrine

C. ADH

D. Dopamine

The hormone often referred to as the 'love hormone' is oxytocin. This designation arises primarily from its crucial functions in social bonding, sexual reproduction, and nurturing behaviors, particularly during childbirth and lactation. During labor, oxytocin stimulates uterine contractions, facilitating the childbirth process. After delivery, it also promotes maternal behaviors by fostering emotional bonds between mothers and their infants. This bonding is critical not only for the mother and child but also plays a vital role in establishing social connections. Oxytocin also helps with milk ejection during breastfeeding, further solidifying its role in nurturing and emotional connections. Its influence extends beyond reproductive functions, impacting emotional well-being and social behaviors, which reinforces the idea of it being linked to love and attachment. The other hormones listed do not share the same direct association with childbirth and emotional bonding as oxytocin does. Understanding the unique roles of hormones in bodily functions can aid in comprehending how they impact both physical processes and emotional health.

5. Which organelle is primarily responsible for synthesizing proteins and repairing the plasma membrane?

A. Rough ER

B. Lysosomes

C. Peroxisomes

D. Centriole

The rough endoplasmic reticulum (Rough ER) is primarily responsible for synthesizing proteins. It is characterized by the presence of ribosomes on its cytoplasmic surface, which gives it a "rough" appearance under a microscope. These ribosomes play a crucial role in translating messenger RNA into polypeptide chains, effectively synthesizing proteins. In addition to protein synthesis, the rough ER is also involved in the processing and modification of these proteins, preparing them for their specific functions within the cell or for secretion outside the cell. Additionally, the rough ER contributes to the repair and maintenance of the plasma membrane by synthesizing membrane proteins and ensuring the proper incorporation of these proteins into the membrane structure. The role of the rough ER in protein synthesis connects seamlessly to its function in maintaining and repairing the plasma membrane, as many proteins are integral to the membrane's structure and functionality. Other organelles like lysosomes, peroxisomes, and centrioles have specialized functions that do not directly involve the synthesis of proteins or the direct repair of the plasma membrane. Lysosomes are primarily involved in digestion and waste processing; peroxisomes focus on oxidation reactions and detoxification; and centrioles play a key role in cell division rather than protein synthesis

6. Which organelle is primarily responsible for the storage and breakdown of waste in plant cells?

A. Peroxisomes

B. Central vacuole

C. Rough ER

D. Centriole

The central vacuole plays a crucial role in the storage and breakdown of waste in plant cells. This large, membrane-bound organelle is typically filled with a solution known as cell sap, which contains various substances, including nutrients, ions, and waste products. By storing these materials, the central vacuole helps maintain turgor pressure, supporting the structural integrity of the plant. Additionally, the central vacuole is involved in the degradation of waste products, as it contains enzymes that can break down macromolecules. This function is essential for recycling cellular components and regulating the internal environment of the cell, making it vital for overall plant health and resilience. While peroxisomes are involved in the breakdown of fatty acids and the detoxification of harmful substances, their role is more specialized compared to the central vacuole's broader functions related to waste management and storage. The rough endoplasmic reticulum (ER) is primarily responsible for protein synthesis and processing, while centrioles have a role in cell division, specifically in animal cells, not plants.

7. Which plant hormone primarily regulates phototropism?

A. Ethylene

B. Abscisic Acid

C. Gibberellin

D. Auxin

Phototropism is the growth response of plants to light direction, which is crucial for optimizing light capture for photosynthesis. The primary hormone that regulates this process is auxin. This hormone is produced in the stem's tip and is distributed unevenly in response to light; it accumulates on the side of the stem that is in the shade, promoting cell elongation on that side. As a result, the shaded side of the plant grows faster than the illuminated side, causing the plant to bend toward the light source. This directional growth helps the plant maximize its exposure to light, which is essential for its survival and growth. The involvement of auxin in this growth mechanism demonstrates how plants can adapt their structures to environmental conditions, thereby enhancing their ability to thrive in various light conditions. Other hormones, such as ethylene, abscisic acid, and gibberellin, play different roles in plant development and stress responses, but they are not primarily responsible for regulating phototropism.

8. What is the function of cytokinin in plants?

A. Thirsty signal

B. Cell division for new plant organs

C. Ripening and rotting

D. Stem elongation

Cytokinins are a class of plant hormones that play a crucial role in promoting cell division and growth in plants. They primarily encourage the process of cytokinesis, which is the division of the cytoplasm in a cell, leading to the formation of two daughter cells. This function is essential for the growth of new tissues and organs, such as leaves, stems, and roots. Cytokinins are produced in the root tips and are transported upward through the plant, influencing various stages of growth and development. The correct answer emphasizes this role in facilitating cell division for the development of new plant organs, which is vital for overall plant growth and productivity. This aspect of cytokinin action is particularly important when considering how plants respond to environmental stimuli by growing new structures that can help improve their chances of survival and reproduction.

9. What role does the hormone oxytocin play in the body?

A. Promotes growth

B. Stimulates lactation and childbirth

C. Regulates calcium levels

D. Affects blood glucose levels

Oxytocin is primarily known for its crucial role in stimulating both lactation and childbirth. During childbirth, it is responsible for causing contractions of the uterine muscles, which helps to facilitate labor. This hormone signals the uterus to contract, thus helping to expel the baby from the womb. Following childbirth, oxytocin also plays an essential role in lactation by promoting the "let-down" reflex, allowing milk to be released from the mammary glands to the nipple for breastfeeding. The other options lack the specific connection to oxytocin's functions. While growth factors are associated with various hormones including growth hormone, calcium regulation is primarily managed by parathyroid hormone and calcitonin, and blood glucose levels are primarily influenced by insulin and glucagon. Therefore, the unique and critical roles of oxytocin in childbirth and breastfeeding make the second option the most accurate choice.

10. In which mode of inheritance do neither parent's traits dominate, resulting in blended traits?

A. Codominance

B. Incomplete dominance

C. Mendelian inheritance

D. Polygenic inheritance

Incomplete dominance describes a mode of inheritance in which the phenotypes of the parents blend to create a new trait in the offspring. This occurs when neither allele is completely dominant over the other, leading to a phenotype that is an intermediate expression of the traits. A classic example of this is seen in the flower color of snapdragons, where red and white flowers can produce pink offspring. In contrast, codominance refers to a situation where both alleles are fully expressed in the phenotype, resulting in offspring that display traits from both parents distinctly rather than as a blend. Mendelian inheritance typically involves complete dominance relationships where one allele completely masks the effects of another. Polygenic inheritance involves multiple genes contributing to a single trait, often resulting in a continuous range of phenotypes rather than a blended effect. Thus, the correct answer highlights the unique characteristic of incomplete dominance, where parental traits do not dominate and lead to an intermediate phenotype.

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://nmatbiology.examzify.com

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