

Biology 30 - Mitosis and Meiosis 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

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- 1. Which statement about gametogenesis is correct?**
 - A. The formation of ova and sperm via meiosis.**
 - B. The formation of zygotes after fertilization.**
 - C. The production of somatic cells by mitosis.**
 - D. The duplication of chromosomes before meiosis.**

- 2. Which statement about non-disjunction disorders is true?**
 - A. They always involve the X chromosome**
 - B. They can generate gametes with abnormal chromosome numbers**
 - C. They produce two normal gametes**
 - D. They only occur in egg cells**

- 3. Which of the following are proposed reasons for aging-related cell death?**
 - A. Spontaneous mutations cause cells to be declared incompetent and shut down**
 - B. All of the above**
 - C. Aging genes shut the cells down**
 - D. Cell lineages die and worn-out cells are not replaced**

- 4. Vegetative reproduction is characterized by which process?**
 - A. Sexual reproduction through seeds.**
 - B. Asexual reproduction where a new plant forms at the end of a creeping stem and, after rooting, the stem disintegrates, separating the new plant.**
 - C. Budding of a new organism from the parent.**
 - D. Fragmentation of a plant into pieces.**

- 5. What happens in metaphase II?**
 - A. Pairs of sister chromatids line up at the center and spindle fibers attach to centromeres.**
 - B. Homologous chromosomes pair up.**
 - C. Cytokinesis occurs and cytoplasm divides.**
 - D. Nucleolus forms.**

- 6. Which event occurs during prophase of mitosis?**
- A. Nuclear membrane reforms**
 - B. Chromosomes line up at the equator**
 - C. Chromosomes condense and become visible; nuclear membrane disappears; nucleolus disappears**
 - D. Centromeres split**
- 7. During anaphase I, how many chromatids are present per chromosome at each pole?**
- A. Four chromatids per chromosome.**
 - B. One chromatid per chromosome.**
 - C. Two chromatids per chromosome; chromosomes remain double-stranded.**
 - D. No chromatids.**
- 8. What is meiosis?**
- A. A form of cell division in sex cells (gametes); reduction division.**
 - B. DNA replication before mitosis.**
 - C. A form of asexual reproduction.**
 - D. Somatic cell division.**
- 9. Which stage follows prophase in mitosis?**
- A. Anaphase**
 - B. Metaphase**
 - C. Telophase**
 - D. Cytokinesis**
- 10. After DNA replication, a chromosome consists of two identical copies held together at the centromere. These copies are called:**
- A. Nucleotides**
 - B. Chromatids**
 - C. Centrosomes**
 - D. Chromosomes**

Answers

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

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Explanations

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1. Which statement about gametogenesis is correct?

- A. The formation of ova and sperm via meiosis.**
- B. The formation of zygotes after fertilization.**
- C. The production of somatic cells by mitosis.**
- D. The duplication of chromosomes before meiosis.**

Gametogenesis is the formation of haploid reproductive cells (gametes) from diploid germ cells through meiosis. This process halves the chromosome number so fertilization can restore the diploid set. In males, spermatogenesis produces four sperm from each germ cell; in females, oogenesis produces one egg (with polar bodies formed due to unequal division). The defining idea is that meiosis generates these haploid gametes, ready for fusion during fertilization to form a new diploid organism. Formation of zygotes after fertilization happens later, somatic cells arise by mitosis, and chromosome duplication before meiosis is a preparatory step rather than the essence of gametogenesis.

2. Which statement about non-disjunction disorders is true?

- A. They always involve the X chromosome**
- B. They can generate gametes with abnormal chromosome numbers**
- C. They produce two normal gametes**
- D. They only occur in egg cells**

Non-disjunction happens when homologous chromosomes or sister chromatids fail to separate during cell division. This creates gametes that carry too many or too few chromosomes. Such errors can occur in germ cells of either parent, during meiosis I or meiosis II, and, when these gametes participate in fertilization, the resulting embryo often has an abnormal chromosome number (aneuploidy). Therefore, the true statement is that non-disjunction can generate gametes with abnormal chromosome numbers. It is not limited to the X chromosome, does not produce only two normal gametes, and can occur in both egg and sperm cells.

3. Which of the following are proposed reasons for aging-related cell death?

- A. Spontaneous mutations cause cells to be declared incompetent and shut down**
- B. All of the above**
- C. Aging genes shut the cells down**
- D. Cell lineages die and worn-out cells are not replaced**

Aging-related cell death is influenced by multiple processes that reduce cellular viability over time. Spontaneous mutations accumulate in cells, damaging DNA and disrupting essential functions, which can trigger senescence or apoptosis. Some models propose aging genes actively promote the shutdown of aged cells, meaning there are regulatory programs that limit or kill damaged cells as organisms age. Additionally, tissues rely on continual replacement of cells, and when stem cell pools become exhausted or less effective, worn-out cells aren't replaced, leading to degeneration. Because each of these ideas has been proposed as a contributor to aging-related cell death, describing all of the above captures the range of mechanisms, making that option the best choice.

4. Vegetative reproduction is characterized by which process?
- A. Sexual reproduction through seeds.
 - B. Asexual reproduction where a new plant forms at the end of a creeping stem and, after rooting, the stem disintegrates, separating the new plant.**
 - C. Budding of a new organism from the parent.
 - D. Fragmentation of a plant into pieces.

Vegetative reproduction is asexual and uses non-reproductive parts of the parent plant to produce new individuals, resulting in genetically identical clones. The described scenario fits propagation via a stolon or runner: a creeping stem grows along the ground, a new plant forms at its end and, once it roots, the new plant becomes independent as the runner detaches. No seeds or fertilization are involved, which is a hallmark of vegetative propagation. This mechanism is distinct from producing seeds through sexual reproduction, and while fragmentation and other forms of asexual spread exist, the specific pattern of a new plant forming at the tip of a creeping stem and then separating best matches stolon-based vegetative propagation.

5. What happens in metaphase II?
- A. Pairs of sister chromatids line up at the center and spindle fibers attach to centromeres.**
 - B. Homologous chromosomes pair up.
 - C. Cytokinesis occurs and cytoplasm divides.
 - D. Nucleolus forms.

Metaphase II centers on the arrangement of sister chromatids after the first division of meiosis. Each chromosome still consists of two identical sister chromatids held together at the centromere, and they line up along the cell's equatorial plane. Spindle fibers attach to the kinetochores at the centromeres, setting up the next step where the sister chromatids will be pulled apart. This is distinct from meiosis I, where homologous chromosomes pair up and align together. Cytokinesis happens after the chromatids are separated, not during metaphase, and the nucleolus re-forms later as the nucleus reassembles, not during this stage.

6. Which event occurs during prophase of mitosis?
- A. Nuclear membrane reforms
 - B. Chromosomes line up at the equator
 - C. Chromosomes condense and become visible; nuclear membrane disappears; nucleolus disappears**
 - D. Centromeres split

During prophase of mitosis, the chromosomes condense and become visible under a light microscope, the nucleolus disappears, and the nuclear envelope breaks down. The spindle apparatus also begins to form as centrosomes move to the poles. These changes prepare the cell for chromosome segregation in the next stages. The other events happen at later stages: chromosomes line up at the equator in metaphase, the nuclear membrane reforms in telophase/cytokinesis, and centromeres split during anaphase when sister chromatids separate. So the description that includes chromosome condensation plus loss of the nuclear membrane and nucleolus best matches prophase.

7. During anaphase I, how many chromatids are present per chromosome at each pole?
- A. Four chromatids per chromosome.
 - B. One chromatid per chromosome.
 - C. Two chromatids per chromosome; chromosomes remain double-stranded.**
 - D. No chromatids.

During anaphase I, homologous chromosomes separate, but the sister chromatids of each chromosome remain attached. Because DNA replication has already duplicated each chromosome, it still consists of two identical sister chromatids held together at the centromere. So, at each pole you have chromosomes that are still double-stranded—two chromatids per chromosome. This contrasts with meiosis II (and mitosis), where the sister chromatids finally separate, producing one chromatid per chromosome. Also, meiosis I reduces the chromosome number by separating homologs, not by separating sister chromatids.

8. What is meiosis?

- A. A form of cell division in sex cells (gametes); reduction division.**
- B. DNA replication before mitosis.
- C. A form of asexual reproduction.
- D. Somatic cell division.

Meiosis is a specialized cell division that reduces the chromosome number by half to form gametes. It happens in germ cells to make haploid cells (sperm and egg), which is essential for sexual reproduction. Because meiosis includes two rounds of division after one round of DNA replication, it produces four non-identical haploid cells. Genetic variation arises from crossing-over during the first division and from the independent assortment of chromosomes. This process is different from mitosis, which makes two identical diploid somatic cells. It's not simply DNA replication before mitosis, and it isn't a form of asexual reproduction or somatic cell division.

9. Which stage follows prophase in mitosis?

- A. Anaphase
- B. Metaphase**
- C. Telophase
- D. Cytokinesis

After prophase, the chromosomes have condensed and the cell is ready to line them up for separation. The next major stage is metaphase, where the chromosomes align along the center of the cell, the metaphase plate, with spindle fibers attached to kinetochores to ensure proper sister-chromatid arrangement. This alignment sets up the accurate separation that happens in the following stage. While there is a brief transitional phase called prometaphase in some descriptions, metaphase is the stage most often identified as the immediate next step in many teaching schemes. Anaphase, telophase, and cytokinesis occur after metaphase, involving separation of chromatids, reformation of nuclei, and division of the cell, respectively.

10. After DNA replication, a chromosome consists of two identical copies held together at the centromere. These copies are called:

A. Nucleotides

B. Chromatids

C. Centrosomes

D. Chromosomes

After DNA replication, the chromosome is made up of two identical DNA copies held together at the centromere. Those two copies are sister chromatids. They stay attached until they are separated during cell division, specifically in mitosis during anaphase (and meiosis II). Nucleotides are the building blocks of DNA, not the copies after replication. Centrosomes are the organizing centers for spindle apparatus, aiding separation but not describing the copied DNA themselves. While a replicated chromosome is often depicted as having two chromatids, the precise term for the two identical copies that remain linked is chromatids (specifically sister chromatids) until they separate.

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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:

<https://bio30mitosismeiosis.examzify.com>

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

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