

# **BIOLOGY 30 – MITOSIS AND MEIOSIS PRACTICE TEST (SAMPLE)**

**STUDY GUIDE**



**SAMPLE STUDY GUIDE  
WITH LIMITED QUESTIONS**

**VISIT US ONLINE FOR  
THE FULL VERSION STUDY GUIDE**

<https://bio30mitosismeiosis.examzify.com>



**Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.**

**ALL RIGHTS RESERVED.**

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

# 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 .....            | 15 |

SAMPLE

# 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

SAMPLE

- 1. During cytokinesis in plant cells, which structure forms at the center and develops into separating cell walls and membranes?**
  - A. A contractile ring forms a cleavage furrow that deepens to divide the cell.
  - B. Vesicles coalesce at the center to form a cell plate that develops into separating cell walls and membranes.
  - C. The cell wall is built from vesicles that fuse at the periphery, not center.
  - D. The nucleus divides first, followed by cytoplasmic separation.
- 2. 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.
- 3. What distinguishes prometaphase from prophase in mitosis?**
  - A. Nuclear envelope breaks down; spindle microtubules attach to kinetochores and chromosomes begin moving toward center.
  - B. Spindle forms outside nucleus; nucleolus disappears.
  - C. Nuclear envelope remains intact; chromatid replication occurs.
  - D. Chromosome condensation occurs.
- 4. What processes occur during interphase of mitosis?**
  - A. Growth phase one (G1), Synthesis (S), and Growth phase 2 (G2)
  - B. DNA replication occurs
  - C. Mitosis begins
  - D. Cytokinesis occurs
- 5. Which process produces haploid spores in the plant life cycle described?**
  - A. Mitosis
  - B. Fertilization
  - C. Budding
  - D. Meiosis

**6. Which statement best defines a sporophyte?**

- A. Haploid generation that forms diploid spores
- B. Diploid generation of a plant that produces haploid spores through meiosis that develop into a gametophyte
- C. Diploid organism that produces diploid spores by mitosis
- D. Gametophyte that produces haploid spores by meiosis

**7. During metaphase I, how are homologous chromosomes arranged?**

- A. Sister chromatids align.
- B. Homologous chromosome pairs (tetrads) align at the plate.
- C. DNA replication occurs.
- D. Chromosomes de-condense.

**8. How is cancer defined?**

- A. Slow, regulated growth
- B. Death of cells due to immune attack
- C. Differentiation of stem cells
- D. Rapid, uncontrolled growth of cells

**9. What occurs during anaphase?**

- A. Sister chromatids separate at centromeres and are pulled toward opposite poles; the cell elongates.
- B. Chromosome duplication occurs.
- C. Nucleolus reappears.
- D. Spindle disappears.

**10. What is a chiasma?**

- A. The site where crossing over occurs between non-sister chromatids.
- B. The centromere region.
- C. The end of a chromosome.
- D. The site where spindle fibers attach.

## **Answers**

SAMPLE

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

SAMPLE

## **Explanations**

SAMPLE

**1. During cytokinesis in plant cells, which structure forms at the center and develops into separating cell walls and membranes?**

- A. A contractile ring forms a cleavage furrow that deepens to divide the cell.
- B. Vesicles coalesce at the center to form a cell plate that develops into separating cell walls and membranes.**
- C. The cell wall is built from vesicles that fuse at the periphery, not center.
- D. The nucleus divides first, followed by cytoplasmic separation.

*In plant cells, the key event of cytokinesis is the formation of a cell plate at the center of the cell. Vesicles derived from the Golgi apparatus accumulate at the center and fuse with one another to create this cell plate. As the plate enlarges, it extends toward the edges of the cell and eventually fuses with the existing plasma membranes, becoming the separating cell walls and new membranes between the two daughter cells. This central plate formation fits plants because their rigid cell walls prevent the membrane from simply pinching inward like a contractile ring would do in animal cells. In contrast, animal cells use a contractile actin ring that constricts the cell membrane to form a cleavage furrow, splitting the cell from the outside in. The idea that cytokinesis simply follows the nucleus divisions (with the nucleus dividing first) is about the timing of mitosis and cytokinesis, but the distinctive mechanism in plants is the formation of the central cell plate rather than a peripheral pinching.*

**2. 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.*

**3. What distinguishes prometaphase from prophase in mitosis?**

- A. Nuclear envelope breaks down; spindle microtubules attach to kinetochores and chromosomes begin moving toward center.
- B. Spindle forms outside nucleus; nucleolus disappears.
- C. Nuclear envelope remains intact; chromatid replication occurs.
- D. Chromosome condensation occurs.**

*Prometaphase is mainly defined by the breakdown of the nuclear envelope and the start of microtubule attachments to kinetochores, which lets chromosomes begin moving toward the center of the cell. In prophase, chromosomes condense into visible shapes, the nucleolus disappears, and the spindle apparatus begins to form outside the nucleus, but the nuclear envelope is still largely intact during much of this stage. So the key distinction is that prometaphase features the nuclear envelope breaking apart and chromosomes being captured and moved by kinetochores, not chromosome condensation itself.*

#### 4. What processes occur during interphase of mitosis?

A. Growth phase one (G1), Synthesis (S), and Growth phase 2 (G2)

B. DNA replication occurs

C. Mitosis begins

D. Cytokinesis occurs

*Interphase is the period before cell division when the cell grows, carries out its normal functions, and duplicates its DNA in preparation for mitosis. During interphase the cell goes through three subphases: G1, where growth and protein synthesis occur; S, where DNA replication happens; and G2, where the cell continues to grow and prepares for mitosis. The best answer lists all three subphases—G1, S, and G2—capturing the full set of interphase activities. DNA replication occurs in the S phase, which is included in that list. Mitosis and cytokinesis, on the other hand, happen after interphase, during the M phase, so statements claiming that mitosis or cytokinesis occurs during interphase aren't correct.*

#### 5. Which process produces haploid spores in the plant life cycle described?

A. Mitosis

B. Fertilization

C. Budding

D. Meiosis

*Meiosis is the division that halves the chromosome number, producing haploid spores. In many plant life cycles with alternation of generations, the diploid sporophyte makes spores through meiosis. These haploid spores then grow (by mitosis) into the multicellular haploid gametophyte, which later forms gametes that fuse during fertilization to restart the cycle as a diploid zygote. Mitosis would not create haploid spores, since it maintains the chromosome number, and fertilization combines haploid cells rather than producing spores. Budding is a form of asexual reproduction and also does not generate spores.*

#### 6. Which statement best defines a sporophyte?

A. Haploid generation that forms diploid spores

B. Diploid generation of a plant that produces haploid spores through meiosis that develop into a gametophyte

C. Diploid organism that produces diploid spores by mitosis

D. Gametophyte that produces haploid spores by meiosis

*In plants, life cycles alternate between a diploid sporophyte and a haploid gametophyte. The sporophyte is the diploid generation, and its job is to produce spores through meiosis. These spores are haploid and grow into the next generation, the haploid gametophyte, which then forms gametes by mitosis. When those gametes fuse, a diploid zygote forms and grows into a new sporophyte. So the statement that best defines a sporophyte is that it is the diploid generation that produces haploid spores via meiosis, which develop into the gametophyte.*

## 7. During metaphase I, how are homologous chromosomes arranged?

- A. Sister chromatids align.
- B. Homologous chromosome pairs (tetrads) align at the plate.**
- C. DNA replication occurs.
- D. Chromosomes de-condense.

*During metaphase I, homologous chromosome pairs align at the metaphase plate as tetrads. Each tetrad contains one chromosome from each parent, and each chromosome is made of two sister chromatids held together at the centromere. The spindle fibers attach to kinetochores so the homologous pairs line up in the center and will separate later in meiosis I, enabling independent assortment. DNA replication has already occurred earlier in S phase, so the chromosomes are replicated, but the sister chromatids remain joined at this stage. They stay condensed through metaphase; de-condensation happens later after meiosis.*

## 8. How is cancer defined?

- A. Slow, regulated growth
- B. Death of cells due to immune attack
- C. Differentiation of stem cells
- D. Rapid, uncontrolled growth of cells**

*Cancer is defined by cells proliferating out of control due to disruptions in normal growth regulation. The essential idea is unregulated, persistent cell division that ignores the signals telling cells to stop or to die, which can lead to tumors and the potential to invade other tissues. The option describing rapid, uncontrolled growth captures this hallmark. In contrast, slow, regulated growth reflects normal tissue renewal; immune attack-driven cell death isn't how cancer is defined, and differentiation of stem cells relates to normal development rather than the unchecked proliferation characteristic of cancer.*

## 9. What occurs during anaphase?

- A. Sister chromatids separate at centromeres and are pulled toward opposite poles; the cell elongates.**
- B. Chromosome duplication occurs.
- C. Nucleolus reappears.
- D. Spindle disappears.

*Anaphase is the stage when sister chromatids separate at the centromeres and are pulled toward opposite poles. This happens because cohesin proteins holding the chromatids together are cleaved, so each chromatid becomes an individual chromosome that is dragged toward a pole by shortening kinetochore microtubules. At the same time, polarity-directed microtubules lengthen and push the poles farther apart, so the cell elongates as chromatids move away from the center. This separation ensures two identical sets of genetic material end up in the daughter cells. Chromosome duplication occurs earlier, in S phase. The nucleolus disappears earlier in mitosis and reappears as the nucleus reforms in telophase. The spindle remains through anaphase and is largely disassembled after cytokinesis, not during anaphase itself.*

## 10. What is a chiasma?

- A. The site where crossing over occurs between non-sister chromatids.
- B. The centromere region.
- C. The end of a chromosome.
- D. The site where spindle fibers attach.

*Chiasma is the site where crossing over occurs between non-sister chromatids during prophase I of meiosis. As homologous chromosomes pair up (synapsis) to form a tetrad, genetic material is exchanged at these points, creating the X-shaped regions you can sometimes observe. This recombination increases genetic variation in gametes and helps hold the homologs together until they are separated at anaphase I. It's not the centromere (the constricted region where kinetochores attach), not the end of the chromosome (telomere), and not the site where spindle fibers attach.*

SAMPLE

## 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](mailto: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!

SAMPLE