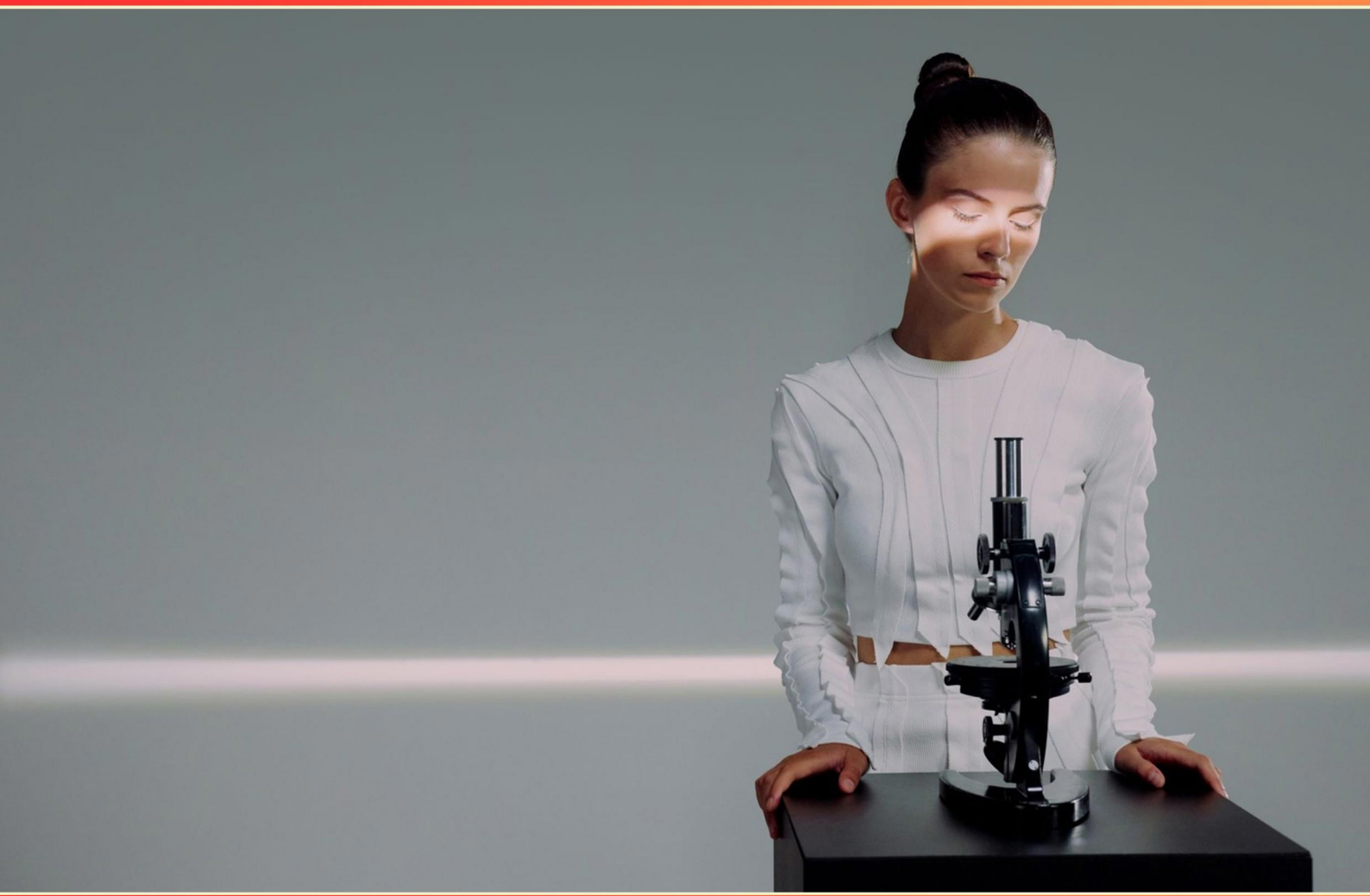
ALBERTA BIOLOGY 30 CELL DIVISION PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://albertabio30celldivision.examzify.com

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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.

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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!

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Questions

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1. The presence of three copies of chromosome 21 is called

A. Trisomy 21

B. Monosomy 21

C. Polyploidy 21

D. Nondisjunction 21

2. Edwards syndrome corresponds to trisomy of chromosome which number?

A. 21

B. 18

C. 13

D. 17

3. In the first meiotic interphase, how many times does DNA replication occur?

A. Twice

B. Three times

C. Not at all

D. Once

4. What energy and material resources do cells prepare before division?

A. ATP, nucleotides, dNTPs, enzymes, membranes, organelles, and proper signaling.

B. Only ATP is required.

C. Only proteins and lipids are required.

D. DNA and histones are sufficient.

5. Are gametes haploid or diploid?

A. Haploid

B. Diploid

C. Polyploid

D. Diploid and haploid depending on organism

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6. Which combination of sex chromosomes is typical for human females?

A. XY

B. XX

C. YY

D. XO

7. Which term describes the random joining of gametes to form a zygote?

A. Independent assortment

B. Crossing over

C. Random fertilization

D. Gametogenesis

8. Which statement describes anaphase?

A. Division of the cytoplasm during cell division

B. The chromosomes become longer, thinner, and less distinct; the nuclear membrane forms

C. Chromosomes line up in the middle of the cell

D. Phase of mitosis in which the chromosomes separate and move to opposite ends of the cell

9. If a cell is frozen after 32 divisions, how many divisions will it complete after thawed?

A. 18

B. 16

C. 32

D. 50

10. Totipotent means what?

A. A cell that can only become a neuron.

B. A cell that cannot differentiate.

C. A cell that is able to bring a cell to turn into any type of cell.

D. A cell that can only become a muscle cell.

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Answers

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

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Explanations

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1. The presence of three copies of chromosome 21 is called

A. Trisomy 21

B. Monosomy 21

C. Polyploidy 21

D. Nondisjunction 21

Having three copies of chromosome 21 is a form of aneuploidy called trisomy 21. In normal human cells, chromosomes come in pairs, but when one chromosome is present in three copies, that extra copy can disrupt development and is linked to Down syndrome. Monosomy 21 would mean only one copy of chromosome 21, which is typically not viable. Polyploidy refers to having an extra full set of all chromosomes, not just a single chromosome. Nondisjunction is the error that can cause trisomy 21 by failing to separate chromosomes during meiosis, but the condition itself is called trisomy 21.

2. Edwards syndrome corresponds to trisomy of chromosome which number?

A. 21

B. 18

C. 13

D. 17

Edwards syndrome occurs when there are three copies of chromosome 18 in every cell (trisomy 18). The extra chromosome disrupts multiple developmental processes, leading to severe congenital abnormalities and a poor prognosis, with most affected individuals not surviving beyond infancy. This condition is specifically tied to trisomy 18, while trisomy 21 causes Down syndrome and trisomy 13 causes Patau syndrome, each involving a different chromosome.

3. In the first meiotic interphase, how many times does DNA replication occur?

A. Twice

B. Three times

C. Not at all

D. Once

DNA replication happens once before meiosis I begins, during the S phase of the first interphase. This single replication duplicates the genome so each chromosome becomes a pair of sister chromatids held together at the centromere. After replication, homologous chromosomes pair up and may exchange genetic material during prophase I, then the cells proceed through meiosis I where homologs separate while the sister chromatids stay together. There's no additional DNA replication between meiosis I and meiosis II, so the final gametes receive just one chromatid from each chromosome.

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4. What energy and material resources do cells prepare before division?

A. ATP, nucleotides, dNTPs, enzymes, membranes, organelles, and proper signaling.

B. Only ATP is required.

C. Only proteins and lipids are required.

D. DNA and histones are sufficient.

Before a cell divides, it must gather energy and construction materials to build two viable daughter cells. ATP powers the many energy-demanding steps of division, from unwinding DNA and replicating it to assembling the spindle and forming new membranes. It also needs nucleotides, including dNTPs, as the essential building blocks for copying the genome. Enzymes such as DNA polymerases, helicases, ligases, and repair enzymes are required to carry out replication and ensure accuracy. In addition, membranes and organelles must be duplicated so each daughter cell has its own functional components, and signaling molecules (like cyclins and kinases) coordinate the timing and progression of the cell cycle. So the best answer includes energy currency, nucleotides, the enzymes involved in replication, membranes and organelles, and proper signaling. Relying only on ATP misses the nucleotide supply and the regulatory machinery, while focusing only on proteins and lipids ignores DNA building blocks and energy needs, and DNA plus histones alone don't account for the other essential resources required for division.

5. Are gametes haploid or diploid?

A. Haploid

B. Diploid

C. Polyploid

D. Diploid and haploid depending on organism

Gametes are haploid, meaning they contain a single complete set of chromosomes. This design lets two gametes fuse during fertilization to form a zygote with the organism's normal diploid chromosome number. In humans, for example, somatic cells are diploid (46 chromosomes), while gametes carry 23. Meiosis reduces the chromosome number to haploid so fertilization restores the diploid state. There are occasional exceptions in certain species where unusual meiosis or life cycles produce diploid (or higher) gametes, but the standard concept is that gametes are haploid.

6. Which combination of sex chromosomes is typical for human females?

A. XY

B. XX

C. YY

D. XO

In humans, sex is determined by the presence of X and Y chromosomes. The typical female chromosome set is two X chromosomes (XX). The Y chromosome carries genes (like SRY) that direct male development, so having a Y leads to male development. A YY configuration isn't viable in humans, and an XO pattern occurs in Turner syndrome—individuals are female but not the typical chromosomal pattern. Therefore, XX is the standard for human females.

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7. Which term describes the random joining of gametes to form a zygote?

A. Independent assortment

B. Crossing over

C. Random fertilization

D. Gametogenesis

The main idea here is how genetic variation arises when a sperm and egg meet to form a zygote. The term that describes the random joining of gametes is random fertilization. Because each gamete carries a different mix of alleles from the parents (thanks to crossing over and independent assortment during meiosis), any sperm could fertilize any egg, making the resulting zygote's genotype highly variable. Crossing over creates new allele combinations within a single chromosome during gamete formation, but it describes events inside one gamete, not the fusion of gametes. Independent assortment explains how homologous chromosomes are distributed into gametes during meiosis, not the actual union of gametes. Gametogenesis is the overall process of making gametes, not the fertilization step itself.

8. Which statement describes anaphase?

A. Division of the cytoplasm during cell division

B. The chromosomes become longer, thinner, and less distinct; the nuclear membrane forms

C. Chromosomes line up in the middle of the cell

D. Phase of mitosis in which the chromosomes separate and move to opposite ends of the cell

Anaphase is the stage when the sister chromatids separate and move to opposite ends of the cell. This happens as the centromeres split and motor proteins along the kinetochores pull each chromatid toward a pole, aided by shortening microtubules that shorten the distance between poles. This movement marks the active segregation of genetic material into the two future daughter cells. That idea fits the described option best because it emphasizes the separation and movement of chromosomes. In metaphase, chromosomes line up in the middle; in cytokinesis, the cytoplasm divides; and in telophase the chromosomes arrive at the poles, de-condense, and the nuclear envelope reforms.

9. If a cell is frozen after 32 divisions, how many divisions will it complete after thawed?

A. 18

B. 16

C. 32

D. 50

Cells have a finite number of divisions because telomeres shorten with each division, limiting how many times a somatic cell can divide (the Hayflick limit). Freezing preserves the cell's state but doesn't reset or repair telomeres, so the remaining divisions after thawing are the total limit minus the divisions already completed. If this cell type has a typical limit of about fifty divisions, having done thirty-two already leaves eighteen more divisions possible. Therefore, it will complete eighteen divisions after thawing. The other numbers don't fit because they either ignore the finite division limit or imply resetting or a different total capacity.

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10. Totipotent means what?

A. A cell that can only become a neuron.

B. A cell that cannot differentiate.

C. A cell that is able to bring a cell to turn into any type of cell.

D. A cell that can only become a muscle cell.

Totipotent describes a cell with the highest developmental potential: it can form all cell types of the organism, including the tissues that support growth such as the placenta. The statement that a cell can become any type of cell matches this broad capability exactly, so it's the best answer. In early development, cells are totipotent (the fertilized egg and the very early divisions). As development continues, cells become pluripotent (many but not all cell types) and then multipotent or unipotent, with progressively more limited fates. The other descriptions describe much more specialized or non-differentiating states, which do not capture the full versatility of totipotent cells.

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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://albertabio30celldivision.examzify.com

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

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