

BIOTECHNOLOGY EOPA PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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 opposite arrangement of the sugar-phosphate backbones in a DNA double helix?**
 - A. Parallel
 - B. Complementary
 - C. Anti-parallel
 - D. Antiparallel

- 2. Which instrument is used to transfer liquids into containers with small openings and has a wide mouth and narrow spout?**
 - A. Funnel
 - B. Beaker
 - C. Graduated Cylinder
 - D. Pipette

- 3. Genetic testing identifies changes in what?**
 - A. Cell membrane permeability.
 - B. Chromosomes, genes, or proteins.
 - C. Blood pressure and heart rate.
 - D. Metabolic energy production.

- 4. Which statement is true about Rh compatibility in transfusions?**
 - A. Rh-negative blood is given to Rh-negative patients
 - B. Rh-negative blood can be given to Rh-positive patients
 - C. Rh-positive blood can be given to Rh-negative patients
 - D. Rh-positive blood is never given to Rh-positive patients

- 5. Nucleic acids are polymers made of what building blocks?**
 - A. Nucleotides
 - B. Amino acids
 - C. Fatty acids
 - D. Monosaccharides

- 6. Which term refers to long strands of DNA intertwined with protein molecules?**
- A. Chromosomes
 - B. Nucleus
 - C. Cytoplasm
 - D. Ribosomes
- 7. Which instrument is best described as a narrow, tall container used for accurate measurement of liquid volume?**
- A. Volumetric Pipet
 - B. Volumetric Flask
 - C. Graduated Cylinder
 - D. Full-face Shield
- 8. Organisms with altered genomes are known as what?**
- A. Transgenic.
 - B. Genomic-stable.
 - C. Non-genetic.
 - D. Cloned.
- 9. Which description correctly defines binary fission?**
- A. Sexual reproduction involving exchange of DNA between cells
 - B. A form of asexual reproduction in which one cell divides into two equal-sized cells
 - C. A form of asexual reproduction in single-celled organisms by which one cell divides into two cells of the same size
 - D. Budding
- 10. Which feature is typical of eukaryotic cells?**
- A. They lack a nucleus.
 - B. They are always unicellular.
 - C. They have no genetic material.
 - D. They possess a true nucleus enclosed by a membrane.

Answers

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

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Explanations

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1. What is the opposite arrangement of the sugar-phosphate backbones in a DNA double helix?

- A. Parallel
- B. Complementary
- C. Anti-parallel
- D. Antiparallel**

The arrangement being tested is how the two DNA strands orient their backbones. In DNA, the sugar-phosphate backbones run in opposite directions along the helix: one strand goes 5' to 3' while the other goes 3' to 5'. This antiparallel orientation is essential for proper base pairing and for enzymes like DNA polymerase, which add nucleotides to the 3' end during synthesis. If the strands were parallel (same direction), the geometry wouldn't support the standard Watson-Crick pairing in the helix and would disrupt replication and transcription. Complementary describes which bases pair, not the overall backbone direction, so it doesn't describe the orientation of the backbones. So the term antiparallel best captures how the backbones are arranged.

2. Which instrument is used to transfer liquids into containers with small openings and has a wide mouth and narrow spout?

- A. Funnel**
- B. Beaker
- C. Graduated Cylinder
- D. Pipette

Funnels are designed to pour liquids into containers with small openings by using a wide mouth and a narrow spout. The broad top catches and holds the liquid, while the slim stem guides it precisely into a bottle, flask, or test tube without splashing. This combination makes pouring into narrow openings much easier and safer, reducing spills. Beakers have wide mouths but no narrow spout, so they're not ideal for directing liquid into small mouths. A graduated cylinder is built for measuring rather than guiding pours into another container. A pipette excels at delivering precise, small volumes but isn't the general tool for transferring larger amounts into containers with narrow openings. So the funnel best fits the described use.

3. Genetic testing identifies changes in what?

- A. Cell membrane permeability.
- B. Chromosomes, genes, or proteins.**
- C. Blood pressure and heart rate.
- D. Metabolic energy production.

Genetic testing is used to detect alterations in the genetic material or its direct products. It looks for changes in chromosomes, in specific genes, or in the proteins encoded by those genes. For example, chromosomal changes like extra copies or missing segments, gene mutations that alter function, or abnormal protein variants can indicate a genetic condition or carrier status. This distinguishes it from measuring physical traits or cellular functions, such as how readily a cell membrane lets substances through, which is a physiological property rather than a genetic change. It also isn't about whole-body measurements like blood pressure or heart rate, or about energy production directly, which are influenced by many factors beyond the genome. Therefore, identifying changes in chromosomes, genes, or proteins captures what genetic testing is designed to reveal.

4. Which statement is true about Rh compatibility in transfusions?

- A. Rh-negative blood is given to Rh-negative patients
- B. Rh-negative blood can be given to Rh-positive patients
- C. Rh-positive blood can be given to Rh-negative patients
- D. Rh-positive blood is never given to Rh-positive patients

Rh compatibility centers on whether red blood cells carry the D antigen. People who are Rh-negative lack this antigen, so if they receive Rh-positive blood, their immune system can recognize the D antigen as foreign and make anti-D antibodies. Those antibodies can then cause a reaction if the person is exposed to Rh-positive blood again in the future. To prevent this sensitization, the safest and most consistent practice is to transfuse Rh-negative patients with Rh-negative blood. Rh-positive blood can be given to Rh-positive recipients because their immune system already tolerates the D antigen. The other options would risk sensitization or are simply not necessary for someone who is Rh-positive.

5. Nucleic acids are polymers made of what building blocks?

- A. Nucleotides
- B. Amino acids
- C. Fatty acids
- D. Monosaccharides

Nucleic acids are polymers built from repeating units called nucleotides. Each nucleotide contains a sugar (deoxyribose in DNA or ribose in RNA), a phosphate, and a nitrogenous base. Nucleotides link together via phosphodiester bonds to form long chains that store and transmit genetic information. This is distinct from other biomolecules: proteins are made from amino acids, lipids from fatty acids, and carbohydrates from monosaccharides. So the building blocks are nucleotides.

6. Which term refers to long strands of DNA intertwined with protein molecules?

- A. Chromosomes
- B. Nucleus
- C. Cytoplasm
- D. Ribosomes

Chromosomes are the structures that carry genetic material, made of long DNA strands bound to proteins. DNA wraps around histone proteins to form a complex called chromatin, which condenses into chromosomes, especially during cell division. This packaging lets the huge molecule of DNA fit inside the nucleus and ensures accurate replication and inheritance. The nucleus is the compartment that houses chromosomes; cytoplasm is the cell fluid outside the nucleus, and ribosomes are the molecular machines that synthesize proteins. So the term for these long DNA-protein strands is chromosomes.

7. Which instrument is best described as a narrow, tall container used for accurate measurement of liquid volume?

- A. Volumetric Pipet
- B. Volumetric Flask
- C. Graduated Cylinder**
- D. Full-face Shield

Measuring liquid volume relies on choosing glassware whose shape and markings match the precision you need. A graduated cylinder fits the description of a narrow, tall container with graduation marks along its length, designed for reading volumes with reasonable accuracy. To read it properly, view the meniscus at eye level and read the bottom of the curve where the scale lines cross the liquid's surface. This setup gives a reliable measurement for everyday lab tasks, offering more precision than a beaker or flask but less than true volumetric glassware. The volumetric pipet is for delivering a precise, fixed volume, not for measuring varying amounts. The volumetric flask is used to prepare solutions to a exact final volume, not to measure an arbitrary amount. The full-face shield is PPE and isn't used for measuring liquid volumes.

8. Organisms with altered genomes are known as what?

- A. Transgenic.**
- B. Genomic-stable.
- C. Non-genetic.
- D. Cloned.

Transgenic describes an organism that carries genes from another species or genetic background inserted into its genome and stably inherited. This is achieved through genetic engineering so the foreign DNA becomes part of the organism's genome and can be passed to offspring, producing new traits. For example, crops engineered to express a bacterial protein for pest resistance are transgenic. This term specifically captures the idea of altered, heritable genetic material, unlike cloning (which is making an exact genetic copy), non-genetic (no genetic change), or genomic-stable, which isn't a standard way to describe organisms with modified genomes.

9. Which description correctly defines binary fission?

- A. Sexual reproduction involving exchange of DNA between cells
- B. A form of asexual reproduction in which one cell divides into two equal-sized cells
- C. A form of asexual reproduction in single-celled organisms by which one cell divides into two cells of the same size**
- D. Budding

Binary fission is an asexual reproduction method used by single-celled organisms where one cell copies its DNA and splits into two daughter cells that are essentially the same size. There's no exchange of genetic material, so the offspring are genetically identical to the parent aside from any mutations. This distinguishes it from sexual reproduction, which involves DNA exchange, and from budding, where a new organism grows out from the parent and may start smaller. The description that specifies single-celled organisms and two cells of the same size best captures what binary fission is.

10. Which feature is typical of eukaryotic cells?

- A. They lack a nucleus.
- B. They are always unicellular.
- C. They have no genetic material.
- D. They possess a true nucleus enclosed by a membrane.**

The feature being tested is the presence of a membrane-bound nucleus. Eukaryotic cells have a true nucleus enclosed by a nuclear membrane, which houses their genetic material. This arrangement distinguishes them from prokaryotic cells, which lack a membrane-bound nucleus and have DNA found in an open region of the cell. The other options don't fit because a nucleus-free cell describes prokaryotes, eukaryotes are not limited to a single-cell form and many are multicellular, and all cells contain genetic material. The nucleus enclosed by a membrane is central to organizing and protecting the genome and allows compartmentalized gene expression.

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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://biotecheopa.examzify.com>

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

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