Amgen Biotech Experience (ABE) Lab Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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 would happen if a plasmid lacked an origin of replication?

A. It would still replicate using host replication

B. It would maintain episomal as linear DNA

C. It would integrate into the host chromosome

D. It would not replicate and would be lost during cell divisions

2. Blue-white screening is used in cloning. What does a white colony indicate?

A. No insert

B. White colonies indicate plasmid intact without insert

C. White colony indicates disruption of lacZ gene due to insertion

D. White colony indicates cell death

3. Why was ampicillin included in the overnight culture?

A. To allow transformed E. coli cells to grow and divide.

B. To kill non-transformants.

C. To provide carbon source.

D. To inhibit growth of all cells.

4. What are the sticky ends generated by BamHI and HindIII?

A. BamHI produces a AGCT overhang; HindIII produces a GATC overhang

B. BamHI produces a GATC overhang; HindIII produces an AGCT overhang

C. BamHI produces a TCGA overhang; HindIII produces a CTAG overhang

D. BamHI produces a CCGG overhang; HindIII produces a AATT overhang

5. Which feature on a cloning plasmid serves as a region with many unique restriction sites to insert DNA?

A. The multiple cloning site

B. The origin of replication

C. The selectable marker

D. The promoter

6. What was the purpose of the Elution Buffer?

A. Low salt concentration

B. reflip mFP back to original conformation (hydrophobic point in and hydrophilic point out)

C. To denature the protein

D. mFP is now released from resin

7. What does OD600 measure?

A. Optical density at 600 nm; a proxy for cell density in a liquid culture.

B. Absolute concentration of DNA.

C. pH of the culture.

D. Temperature of the incubator.

8. Why did E. coli only grow on the P+ side of the LB/amp plate?

A. The plasmid conferred ampicillin resistance, enabling survival.

B. Ampicillin was absent on the P+ side.

C. The plate had more nutrients on the P+ side.

D. Arabinose was present on the P+ side to induce expression.

9. Which component is required to initiate DNA synthesis in PCR?

A. DNA polymerase (e.g., Taq polymerase) along with primers, nucleotides, and buffer.

B. RNA polymerase and transcription factors.

C. DNA ligase and primers only.

D. Helicase alone.

10. Which term describes a group of identical bacterial cells growing together on a solid medium?

A. Colony

B. Biofilm

C. Clone

D. Culture

Answers

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

Explanations

1. What would happen if a plasmid lacked an origin of replication?

A. It would still replicate using host replication

B. It would maintain episomal as linear DNA

C. It would integrate into the host chromosome

D. It would not replicate and would be lost during cell divisions

Origin of replication is the site where plasmid DNA replication starts. Without this initiation point, there's no way for the plasmid to copy itself during the cell cycle, so its copy number cannot be maintained. As cells divide, the existing plasmid copies are not replenished, and the plasmid is gradually lost from the population unless it becomes integrated or is kept by selective pressure. In bacteria, plasmids are typically circular, and linear episomal DNA or random chromosomal integration aren't the expected outcomes from simply lacking an origin. So the plasmid would not replicate and would be lost during cell divisions.

2. Blue-white screening is used in cloning. What does a white colony indicate?

A. No insert

B. White colonies indicate plasmid intact without insert

C. White colony indicates disruption of lacZ gene due to insertion

D. White colony indicates cell death

Blue-white screening uses the lacZ gene to report on inserts. When the plasmid's lacZ is intact and functional, beta-galactosidase cleaves X-gal and colonies appear blue. If a DNA fragment is inserted into the cloning site within lacZ, the gene is disrupted and beta-galactosidase activity is lost, so X-gal is not cleaved and the colonies stay white. Therefore a white colony signals that the lacZ gene was disrupted by the insertion, indicating a recombinant plasmid. The other options don't fit: no insert leaves lacZ intact and produces blue colonies; a plasmid intact without insert would be blue; and cell death isn't what this screening reads.

3. Why was ampicillin included in the overnight culture?

A. To allow transformed E. coli cells to grow and divide.

B. To kill non-transformants.

C. To provide carbon source.

D. To inhibit growth of all cells.

Ampicillin acts as a selective pressure in transformation experiments. The plasmid you introduce into E. coli carries an ampicillin resistance gene, so only cells that took up the plasmid can survive and keep growing in the presence of the antibiotic.
Non-transformants, which lack the resistance, are killed or unable to divide. This selective environment enriches for cells that carry the plasmid, making it easier to identify and study the transformed population. Ampicillin isn't a carbon source, and it doesn't suppress growth of all cells—only the ones without resistance are affected.

4. What are the sticky ends generated by BamHI and HindIII?

A. BamHI produces a AGCT overhang; HindIII produces a GATC overhang

B. BamHI produces a GATC overhang; HindIII produces an AGCT overhang

C. BamHI produces a TCGA overhang; HindIII produces a CTAG overhang

D. BamHI produces a CCGG overhang; HindIII produces a AATT overhang

Sticky ends come from staggered cuts by restriction enzymes, leaving short single-stranded overhangs that can base-pair with complementary sequences. BamHI recognizes GGATCC and cuts between the first two Gs (G/GATCC), producing a 4-base 5' overhang of GATC. HindIII recognizes AAGCTT and cuts between the two As (A/A GCTT), producing a 4-base 5' overhang of AGCT. So BamHI yields GATC as its overhang and HindIII yields AGCT.

5. Which feature on a cloning plasmid serves as a region with many unique restriction sites to insert DNA?

A. The multiple cloning site

B. The origin of replication

C. The selectable marker

D. The promoter

The multiple cloning site provides a region with many unique restriction sites for inserting DNA. This short stretch on a cloning plasmid contains several different restriction enzyme recognition sequences, each typically present only once within that region. That design lets you cut the plasmid and your DNA insert with compatible enzymes, producing ends that ligate together cleanly. Because the sites are unique, you can choose an enzyme that cuts the plasmid only once, ensuring the inserted fragment goes into the intended location without disrupting other parts of the plasmid. This flexibility also helps with directional cloning and preserving important features near the insertion site. The origin of replication is responsible for plasmid copying, the selectable marker shows which cells carry the plasmid, and the promoter directs transcription—roles that do not directly enable insertion of DNA in the same way the multiple cloning site does.

6. What was the purpose of the Elution Buffer?

A. Low salt concentration

B. reflip mFP back to original conformation (hydrophobic point in and hydrophilic point out)

C. To denature the protein

D. mFP is now released from resin

Elution buffer is used to release the protein from the resin by changing the conditions that keep the protein bound. When the protein (mFP) has attached to the resin, the elution step alters factors like ionic strength or pH (and sometimes uses a competitive agent) so the binding interactions weaken and the protein detaches. That detachment is what we collect as the eluate. The other ideas—using low salt, refolding the protein, or denaturing—do not describe the primary goal of elution. So the purpose is to have mFP released from the resin.

7. What does OD600 measure?

A. Optical density at 600 nm; a proxy for cell density in a liquid culture.

B. Absolute concentration of DNA.

C. pH of the culture.

D. Temperature of the incubator.

OD600 is a measure of how turbid a liquid culture is by shining light at 600 nm and detecting how much passes through. The more cells present, the more light is scattered and absorbed, so less light reaches the detector and the optical density increases. This relationship lets you estimate cell density quickly without destroying the culture, and it's commonly used to monitor growth curves or to standardize inoculations. It's not a direct measure of DNA, pH, or temperature. DNA concentration is assessed with methods that target nucleic acids (often using absorbance at 260 nm or DNA-specific assays). pH is read with a pH meter or indicator dyes, and temperature is measured with a thermometer or probe. Keep in mind that OD600 reflects turbidity from all cells (live and dead) and has a usable linear range, so very high densities may require dilution for accurate readings.

8. Why did E. coli only grow on the P+ side of the LB/amp plate?

A. The plasmid conferred ampicillin resistance, enabling survival.

B. Ampicillin was absent on the P+ side.

C. The plate had more nutrients on the P+ side.

D. Arabinose was present on the P+ side to induce expression.

Antibiotic selection is being tested. On a plate that contains ampicillin, only bacteria that carry a plasmid with the ampicillin resistance gene can survive and form colonies. The P+ side has the plasmid, so those E. coli express resistance and grow despite the antibiotic. The P- side lacks the plasmid, making the cells susceptible to ampicillin, so they don't grow there. The presence of arabinose isn't needed for ampicillin resistance; it would affect expression of other genes on the plasmid, not survival in this antibiotic-containing medium.

9. Which component is required to initiate DNA synthesis in PCR?

A. DNA polymerase (e.g., Taq polymerase) along with primers, nucleotides, and buffer.

B. RNA polymerase and transcription factors.

C. DNA ligase and primers only.

D. Helicase alone.

DNA synthesis in PCR begins when a DNA polymerase enzyme extends from a primer, using nucleotides as building blocks and working under the right buffer conditions. The primers provide starting points with a 3' end for the polymerase to add nucleotides, so synthesis can begin and be copied across cycles. The polymerase alone wouldn't start anything without these primers and substrates, and the buffer ensures the enzyme functions optimally at the temperatures used in PCR. The other options don't fit because RNA polymerase would make RNA, not DNA; DNA ligase only joins existing DNA strands and doesn't initiate synthesis; helicase only unwinds DNA, not synthesize new strands. So the combination of DNA polymerase with primers, nucleotides, and buffer is required to initiate DNA synthesis in PCR.

10. Which term describes a group of identical bacterial cells growing together on a solid medium?

A. Colony

B. Biofilm

C. Clone

D. Culture

On a solid growth medium, a visible cluster of bacteria that comes from a single progenitor cell is called a colony. Because all cells in that colony descend from the same ancestor, they are genetically identical, forming a clonal group. This visible colony on an agar plate is what microbiologists use to count viable cells (as colony-forming units) and to obtain pure cultures. A biofilm is a surface-attached community embedded in a matrix, usually not a single, discrete mound on a plate. A clone describes genetically identical cells, but doesn't specify the physical grouping on a solid medium. A culture is a general term for growing microbes in a medium, which can be liquid or solid, and doesn't specify the discrete, isolated growth seen as a colony.

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://amgenabelab.examzify.com

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