

AMGEN BIOTECH EXPERIENCE (ABE) LAB PRACTICE TEST (SAMPLE)

STUDY GUIDE



**SAMPLE STUDY GUIDE
WITH LIMITED QUESTIONS**

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THE FULL VERSION STUDY GUIDE**

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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. In the absence of arabinose, what happens to transcription from PBAD?**
 - A. PBAD is constitutively active
 - B. PBAD is repressed and transcription is not activated
 - C. RFP is still produced
 - D. AraC degrades PBAD
- 2. If you observe a sample lane with no bands while ladder shows bands, which is a plausible explanation?**
 - A. The sample may have degraded DNA or was not loaded properly; check reaction conditions, loading, and DNA integrity.
 - B. The ladder caused the sample to run off the gel.
 - C. The gel is not suitable for DNA visualization.
 - D. The DNA concentration is so high it hides bands.
- 3. What is one consequence of recombinant plasmids replicating independently in a cell?**
 - A. It results in multiple copies of the gene, increasing product yield.
 - B. It reduces growth rate.
 - C. It prevents transcription.
 - D. It changes plasmid shape.
- 4. In gel electrophoresis, why do DNA fragments separate by size?**
 - A. Smaller fragments move faster through the gel
 - B. Larger fragments move faster through the gel
 - C. Fragment charge determines migration
 - D. pH of gel determines migration independently of size
- 5. Why is it important to identify and verify a recombinant plasmid?**
 - A. To ensure the plasmid contains the desired gene sequence
 - B. To check colony color
 - C. To measure growth rate
 - D. To estimate plasmid size

- 6. Which statement best describes the purpose of the first stop on a micropipette in a transfer?**
- A. First stop: draw up the correct volume; Second stop: expel liquid
 - B. First stop: expel liquid; Second stop: draw up
 - C. First stop: discard tip; Second: dispense
 - D. First stop: calibrate; Second: mix
- 7. In what circumstances might it be important to use gel electrophoresis to separate and identify plasmids and short linear pieces of DNA?**
- A. If you want to photograph the gel for a lab display
 - B. If you want to measure protein concentration
 - C. If you are making a recombinant plasmid and have to verify that you have been successful
 - D. If you want to sequence the whole genome
- 8. What properties of the amino acids in a protein relate to protein folding?**
- A. The sequence of amino acids does not influence folding.
 - B. Folding is determined solely by environmental temperature.
 - C. The amino acid sequence determines folding through weak noncovalent bonds, hydrophobic effects, and disulfide bridges.
 - D. Folding is random.
- 9. Which plasmid feature enables selection of bacteria that have taken up the plasmid?**
- A. Ori
 - B. Promoter
 - C. Antibiotic resistance gene
 - D. Multiple cloning site
- 10. Which dye has the smallest molecular weight?**
- A. Bromophenol Blue
 - B. Xylene Cyanole
 - C. None of the above
 - D. Orange G

Answers

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

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Explanations

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1. In the absence of arabinose, what happens to transcription from PBAD?

- A. PBAD is constitutively active
- B. PBAD is repressed and transcription is not activated**
- C. RFP is still produced
- D. AraC degrades PBAD

Arabinose-dependent control of transcription is managed by the AraC regulator. In the absence of arabinose, AraC binds to two sites near PBAD and forms a DNA loop that blocks RNA polymerase from initiating transcription. So transcription from PBAD is not activated, and genes like RFP aren't expressed. When arabinose is present, it binds AraC, triggering a change that relieves this repression and allows RNA polymerase to access PBAD, turning transcription ON and producing the reporter protein. The idea that PBAD is always active is incorrect, and the notion that AraC degrades the promoter isn't how this system works.

2. If you observe a sample lane with no bands while ladder shows bands, which is a plausible explanation?

- A. The sample may have degraded DNA or was not loaded properly; check reaction conditions, loading, and DNA integrity.**
- B. The ladder caused the sample to run off the gel.
- C. The gel is not suitable for DNA visualization.
- D. The DNA concentration is so high it hides bands.

Troubleshooting why a sample lane shows no bands while the ladder shows bands. When the ladder in a gel runs and bands are visible but the sample lane is blank, the issue is likely with the sample itself rather than the gel or staining. This points to problems during sample preparation or loading, or the template/DNA quality. If the DNA has degraded, there may be no intact fragments to visualize, or the fragments may be too small or irregular to produce clear bands. If loading was missed or the sample wasn't actually loaded into the well, there would be no signal in that lane despite a working ladder. Checking that the DNA was properly prepared, that the DNA is intact and at a detectable concentration, and that the loading step was performed correctly (including using loading dye and pipetting into the correct well) addresses the issue. The other options don't fit because a gel that can reveal ladder bands indicates the system is capable of visualizing DNA, so claiming the gel isn't suitable isn't consistent. If the ladder runs, the problem isn't that the ladder caused the sample to run off, and a DNA concentration that's too high typically causes smearing or overloading rather than a complete absence of bands in the sample lane.

3. What is one consequence of recombinant plasmids replicating independently in a cell?

- A. It results in multiple copies of the gene, increasing product yield.**
- B. It reduces growth rate.
- C. It prevents transcription.
- D. It changes plasmid shape.

Independent replication means the plasmid carries its own origin of replication and can duplicate on its own inside the cell. This allows a single cell to contain many copies of the recombinant plasmid, increasing the gene dosage of the recombinant gene. With more copies available as templates, transcription can produce more mRNA and, consequently, more protein product, often boosting overall yield. While high copy numbers can sometimes slow growth due to metabolic burden, the direct consequence addressed here is the higher product yield from having multiple plasmid copies. The other options don't reflect this effect: transcription isn't inherently prevented by plasmids, plasmids don't automatically change shape from replication, and the question specifically ties copy number to production output rather than growth rate or structure.

4. In gel electrophoresis, why do DNA fragments separate by size?

- A. Smaller fragments move faster through the gel**
- B. Larger fragments move faster through the gel
- C. Fragment charge determines migration
- D. pH of gel determines migration independently of size

DNA fragments separate by size in a gel because the gel acts as a porous matrix that functions like a sieve. When an electric field is applied, all fragments move toward the positive electrode thanks to their negative phosphate backbone, but they don't travel at the same speed. Smaller pieces slip through the gel pores more easily and encounter less resistance, so they migrate faster. Larger pieces have more trouble moving through the network of pores, facing greater friction and getting delayed, which creates distinct bands by size. While DNA's charge is important for movement, in typical gels the charge-to-length is fairly uniform, so size-related resistance through the gel is the dominant factor. The idea that migration is determined solely by charge or independently of size (via pH alone) isn't accurate in this context.

5. Why is it important to identify and verify a recombinant plasmid?

- A. To ensure the plasmid contains the desired gene sequence**
- B. To check colony color
- C. To measure growth rate
- D. To estimate plasmid size

The key idea here is verifying that the recombinant plasmid actually carries the intended insert in the correct form. This verification matters because downstream work—like expressing a protein or studying its function—depends on having the exact DNA you planned. If the insert is missing, has mutations, or is in the wrong orientation, experiments will not reflect the intended biology and resources are wasted on misleading results. Verification is typically done by sequencing the insert or using diagnostic methods such as restriction enzyme checks or PCR across the insertion junctions to confirm presence, sequence accuracy, and proper boundaries. Colony color or other quick screens can hint that a plasmid is present or that a reporter gene is active, but they don't guarantee that the insert is correct. Growth rate can be influenced by many factors unrelated to the plasmid's sequence, and estimating plasmid size isn't precise enough to confirm the exact gene insert or its orientation.

6. Which statement best describes the purpose of the first stop on a micropipette in a transfer?

- A. First stop: draw up the correct volume; Second stop: expel liquid**
- B. First stop: expel liquid; Second stop: draw up
- C. First stop: discard tip; Second: dispense
- D. First stop: calibrate; Second: mix

The key idea is how a micropipette uses two stops to control a precise transfer. The first stop is the stop you press to aspirate; when you draw up, the plunger moves to this point and pulls a specific, set volume of liquid into the tip. This is where the measurement is defined—the volume you've dialed in is drawn into the tip. The second stop is used to dispense. Pressing past the first stop to the second stop pushes that same volume out of the tip, ensuring you deliver the exact amount you drew up. This two-step action—first drawing in the correct volume, then driving it out—keeps the transfer accurate and helps avoid under- or over-delivering. So, describing the first stop as drawing up the correct volume and the second as expelling the liquid matches how the pipette is designed to function: you set the volume, aspirate to the first stop to capture that volume, then dispense by going to the second stop.

7. In what circumstances might it be important to use gel electrophoresis to separate and identify plasmids and short linear pieces of DNA?

- A. If you want to photograph the gel for a lab display
- B. If you want to measure protein concentration
- C. If you are making a recombinant plasmid and have to verify that you have been successful**
- D. If you want to sequence the whole genome

Gel electrophoresis is used here because it lets you separate DNA by size and by form, so you can tell whether a plasmid and any inserted DNA are present in the expected amounts and lengths. When you create a recombinant plasmid, the plasmid backbone plus the inserted fragment should produce a DNA pattern with bands at specific sizes. Running a gel after cloning (or after a digest you use to check the construct) shows whether the recombinant plasmid is present and whether the insert is correctly incorporated, since the fragments will appear at predictable sizes. You can also distinguish different forms of plasmid DNA (like supercoiled versus linear) because they migrate differently, which helps confirm you've got the right construct overall. This verification step is crucial before moving on to sequencing or expression. Other options don't fit as well because measuring protein concentration is about proteins, not DNA constructs; sequencing a whole genome isn't about checking a specific recombinant plasmid; and photographing a gel is a display step rather than a method to verify that the cloning worked. The answer that best fits is using gel electrophoresis to confirm you've successfully created the recombinant plasmid.

8. What properties of the amino acids in a protein relate to protein folding?

- A. The sequence of amino acids does not influence folding.
- B. Folding is determined solely by environmental temperature.
- C. The amino acid sequence determines folding through weak noncovalent bonds, hydrophobic effects, and disulfide bridges.**
- D. Folding is random.

A protein's folding is guided by the information encoded in its amino acid sequence. The specific side chains of the amino acids determine which interactions can form as the chain adopts a three-dimensional shape. Weak noncovalent bonds—hydrogen bonds, ionic interactions, and van der Waals forces—help shape the regions of the protein and hold them together in the final structure. The hydrophobic effect causes nonpolar residues to hide away from water, promoting a tightly packed core that stabilizes the folded form. Disulfide bridges between cysteine residues provide covalent links that can further lock in the folded configuration, especially in proteins that function outside the cell where oxidizing conditions prevail. All these interactions together drive the protein toward a low-energy, stable structure. Temperature can influence how quickly folding happens and how stable the fold is, but it is not the primary determinant of the final shape, and folding is not random. The sequence and the resulting network of interactions best explain how folding occurs.

9. Which plasmid feature enables selection of bacteria that have taken up the plasmid?

- A. Ori
- B. Promoter
- C. Antibiotic resistance gene
- D. Multiple cloning site

Selecting bacteria that have taken up a plasmid hinges on a marker that lets those cells survive under specific conditions. The antibiotic resistance gene provides that survival advantage: cells carrying the plasmid express a protein that neutralizes or tolerates the antibiotic, so they grow on plates containing the antibiotic while cells without the plasmid are inhibited or die. The origin of replication ensures the plasmid is copied inside the cell, but it does not enable selection. A promoter directs transcription of genes, yet by itself it doesn't distinguish plasmid-containing cells. The multiple cloning site is just a region for inserting DNA and does not confer survival.

10. Which dye has the smallest molecular weight?

- A. Bromophenol Blue
- B. Xylene Cyanole
- C. None of the above
- D. Orange G

The main idea here is understanding how the sizes of tracking dyes relate to how far they travel in a gel during electrophoresis. The dye with the smallest molecular weight will migrate fastest and appear as the leading dye front. Among the dyes listed, Orange G has the smallest molecular weight. Bromophenol Blue is relatively large, and Xylene Cyanol FF is intermediate in size, both heavier than Orange G. Because Orange G is lighter, it moves through the gel more quickly under the same conditions, making it the fastest-propagating dye. This is why Orange G is the correct answer.

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!

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