DAT BOOTCAMP MOLECULES AND FUNDAMENTALS OF BIOLOGY 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.

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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. Which feature is true about wax esters?

A. Presence of ester linkages between acid and alcohol
B. Contain glycerol backbone with three fatty acids
C. Contain phosphate groups
D. Are branched chain amino acids

2. Which nitrogenous base is part of DNA but not RNA?

A. Thymine
B. Uracil
C. Cytosine
D. Adenine

3. Cholesterol is a component in

A. Bacterial membranes
B. Animal cell membranes
C. Plant membranes
D. Nucleic membranes

4. The R-group can what?

A. vary
B. remain the same
C. determine only the charge
D. contain only hydrogen

5. Polymers are:

A. Single units
B. Many monomers joined by chains
C. Diatomic molecules
D. Ionic lattices

6. Cholesterol is a common precursor to

A. Nucleotides
B. Peptide hormones
C. Steroid hormones
D. Carbohydrates

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7. Lactose is a _____ from _____

A. disaccharide; glucose and galactose

B. disaccharide; glucose and galatose

C. polysaccharide; glucose and galactose

D. monosaccharide; glucose and galactose

8. Polysaccharides have diverse roles; which statement describes their functional range?

A. They may have catalytic roles

B. They are always energy sources

C. They are always linear

D. Some are for storage, others for structure

9. Which set of bases is present in DNA?

A. Adenine, Guanine, Thymine, Cytosine

B. Adenine, Guanine, Cytosine, Uracil

C. Adenine, Guanine, Thymine, Uracil

D. Adenine, Uracil, Cytosine, Guanine

10. Which statement best describes why cholesterol helps maintain membrane fluidity at cold temperatures?

A. Cholesterol prevents any movement of lipids.

B. Saturated phospholipids remain fluid at all temperatures.

C. Phospholipid tails become shorter at low temperature.

D. Cholesterol and increasing phospholipid unsaturation

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Answers

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

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Explanations

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1. Which feature is true about wax esters?

A. Presence of ester linkages between acid and alcohol

B. Contain glycerol backbone with three fatty acids

C. Contain phosphate groups

D. Are branched chain amino acids

Wax esters are esters formed by linking a fatty acid to a long-chain alcohol through an ester bond. That single ester linkage between the acid and the alcohol is the defining feature. Because of this structure, waxes lack the glycerol backbone with three fatty acids found in triglycerides, and they also do not contain phosphate groups as phospholipids do. They aren't built from amino acids either. In short, the key characteristic of wax esters is the ester bond between a fatty acid and a long-chain alcohol.

2. Which nitrogenous base is part of DNA but not RNA?

A. Thymine

B. Uracil

C. Cytosine

D. Adenine

Distinction between DNA and RNA bases. DNA uses thymine, while RNA uses uracil instead of thymine. Thymine is found in DNA but not in RNA, which instead has uracil. This difference is what differentiates the two nucleic acids, so thymine is the base that is present in DNA but not in RNA.

3. Cholesterol is a component in

A. Bacterial membranes

B. Animal cell membranes

C. Plant membranes

D. Nucleic membranes

Cholesterol helps regulate membrane fluidity in animal cell membranes. It is a rigid sterol that sits among the phospholipids in the bilayer, intercalating between fatty-acid tails. This positioning allows it to make the membrane less fluid at higher temperatures, preventing it from becoming too permeable, while at lower temperatures it prevents tight packing of lipids so the membrane doesn't become too rigid. This balancing act helps maintain proper membrane integrity and function across temperature changes, which is especially important for animal cells. Bacterial membranes typically lack cholesterol and use other molecules, like hopanoids, to stabilize their membranes. Plants and fungi use different sterols as well, rather than cholesterol as the major component. So cholesterol is a component of animal cell membranes.

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4. The R-group can what?

A. vary

B. remain the same

C. determine only the charge

D. contain only hydrogen

The R-group is the side chain that differentiates amino acids, making each one unique. While the backbone of amino acids is the same, the R-group varies widely in size, shape, polarity, and charge. This variability is what gives proteins their diverse properties and functions, from hydrophobic cores to active sites with specific chemistry. Because different amino acids have different side chains, the R-group can take on many forms—sometimes it's just a hydrogen (as in glycine), other times it's a bulky nonpolar chain, a polar uncharged group, or a charged group—so it's not fixed or limited to any single feature.

5. Polymers are:

A. Single units

B. Many monomers joined by chains

C. Diatomic molecules

D. Ionic lattices

Polymers are long molecules built from repeating monomer units linked into chains. During polymerization, many monomers join together via covalent bonds to form one macromolecule. This chaining of repeating units is what gives polymers their large size and unique properties, which depend on how many units are in the chain, how the chains branch or cross-link, and how the chains interact with each other. This idea sets polymers apart from a single unit, diatomic molecules (two atoms), or ionic lattices (arrays of ions in a solid). Examples from nature and industry—DNA, proteins, cellulose, polyethylene, and nylon—show how long chains of repeating units create diverse and useful materials.

6. Cholesterol is a common precursor to

A. Nucleotides

B. Peptide hormones

C. Steroid hormones

D. Carbohydrates

Cholesterol provides the backbone for steroid hormones. The four-ring steroid nucleus in cholesterol is the starting point that enzymes modify to form pregnenolone and then other steroids such as progesterone, cortisol, aldosterone, and the sex hormones. That shared origin is why cholesterol is a common precursor to steroid hormones. Nucleotides, peptide hormones, and carbohydrates come from different building blocks—nucleotides from sugar, phosphate, and bases; peptide hormones from amino acids; carbohydrates from sugars. The cholesterol-derived pathway specifically gives rise to the steroid family, which also explains why these hormones are lipophilic and act by intracellular receptors to regulate gene expression.

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7. Lactose is a _____ from _____

A. disaccharide; glucose and galactose

B. disaccharide; glucose and galatose

C. polysaccharide; glucose and galactose

D. monosaccharide; glucose and galactose

Classifying carbohydrates by the number of sugar units shows that lactose falls into the disaccharide category. It is made up of two monosaccharide units: glucose and galactose, linked together by a glycosidic bond (beta-1,4). Because it has two sugar molecules, it is not a monosaccharide (one sugar) or a polysaccharide (many sugars). Lactose is found in milk, and digestion with the enzyme lactase breaks it into glucose and galactose.

8. Polysaccharides have diverse roles; which statement describes their functional range?

A. They may have catalytic roles

B. They are always energy sources

C. They are always linear

D. Some are for storage, others for structure

Polysaccharides show functional diversity because their specific sugar units, the type of glycosidic bonds, and their branching patterns create materials suited for different roles. Some are built to store energy and can be rapidly mobilized when needed—starch in plants and glycogen in animals. Others provide structure, forming rigid, supportive networks such as cellulose in plant cell walls and chitin in fungal cell walls and arthropod exoskeletons. Catalysis is typically performed by enzymes, not by the polysaccharide itself, and polysaccharides can be either branched or linear depending on their purpose. This combination of storage and structural functions best captures the functional range of polysaccharides.

9. Which set of bases is present in DNA?

A. Adenine, Guanine, Thymine, Cytosine

B. Adenine, Guanine, Cytosine, Uracil

C. Adenine, Guanine, Thymine, Uracil

D. Adenine, Uracil, Cytosine, Guanine

DNA contains four bases: adenine, guanine, cytosine, and thymine. Thymine is a DNA-specific base, while uracil is used in RNA instead of thymine. So the set present in DNA is adenine, guanine, cytosine, and thymine. The other options introduce uracil or omit thymine, which would describe RNA or an incomplete DNA set.

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10. Which statement best describes why cholesterol helps maintain membrane fluidity at cold temperatures?

A. Cholesterol prevents any movement of lipids.

B. Saturated phospholipids remain fluid at all temperatures.

C. Phospholipid tails become shorter at low temperature.

D. Cholesterol and increasing phospholipid unsaturation

At cold temperatures, membranes risk becoming too tightly packed and less fluid. Cholesterol acts as a fluidity buffer by inserting itself between phospholipid molecules. Its rigid ring structure prevents the fatty acid tails from stacking too closely, keeping the membrane from solidifying. This helps preserve lateral motion of lipids and maintains a liquid-crystalline state even when things cool down. In addition, having phospholipid tails with double bonds (unsaturation) introduces kinks that further prevent tight packing, boosting fluidity. So the combination of cholesterol's presence and increased unsaturation keeps the membrane fluid when it would otherwise become more gel-like. Why the other ideas don't fit: cholesterol doesn't stop all movement—lipids still move, just not as tightly packed; saturated phospholipids would not stay fluid at all temperatures and actually become more rigid when cold; tail shortening isn't a typical cold-response mechanism in membranes.

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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://datmoleculesfundofbiology.examzify.com

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

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