Principles of Biomedical Science Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

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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

1. Which term denotes a type of lymphocyte that differentiates under the influence of the thymus and is involved in cell-mediated immunity?

A. B Lymphocyte

B. Neuron

C. Digestive System

D. T Lymphocyte

2. Which term describes single-celled microorganisms that are often aggregated into colonies or motile by means of flagella, typically live in soil, water, organic matter, or the bodies of plants and animals, autotrophic, saprophytic, or parasitic in nutrition, and noted for their biochemical effects and pathogenicity?

A. Bacillus

B. Bacteria

C. Metabolic Syndrome

D. Risk Factor

3. A specialized mass of conducting cells located at the atrioventricular junction in the heart.

A. Sinoatrial Node

B. Bundle of His

C. Purkinje fibers

D. Atrioventricular Node

4. A simple graphical way of discovering all potential genotype combinations given parents' genotypes?

A. Genome

B. Punnett Square

C. Pedigree

D. Karyotype

5. Which term is used to describe a genetic variation detected by differences in fragment lengths after restriction enzyme digestion?

A. Thymine

B. Autopsy

C. Restriction Fragment Length Polymorphisms (RFLPs)

D. Glucagon

6. Which term describes a liquid that is a homogeneous mixture of two or more substances?

A. Hydrophobic

B. Solvent

C. Solution

D. Anticodon

7. What term describes the basic unit of life that makes up all living organisms?

A. Molecule

B. Organ

C. Cell

D. Tissue

8. Which term describes the building block of nucleic acids?

A. Nucleotide

B. Monomer

C. Monosaccharide

D. Amino Acid

9. What term describes any of the branching muscular and elastic-walled vessels that carry blood from the heart to the body?

A. Artery

B. Vein

C. Aorta

D. Capillary

10. Which lipoprotein particle carries more cholesterol and is linked to increased risk of heart disease when elevated?

A. Lipoprotein(a)

B. Low Density Lipoprotein (LDL)

C. Chylomicron

D. High Density Lipoprotein (HDL)

Answers

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

Explanations

1. Which term denotes a type of lymphocyte that differentiates under the influence of the thymus and is involved in cell-mediated immunity?

A. B Lymphocyte

B. Neuron

C. Digestive System

D. T Lymphocyte

In adaptive immunity, lymphocytes are the main players and differentiate into two main types: T cells and B cells. T cells mature under the influence of the thymus, which is why they're tied to thymic hormones and development. These cells drive cell-mediated immunity, directly attacking infected cells and coordinating other immune responses through signaling molecules. That makes them essential for responses that don't rely on antibodies. B cells, by contrast, mature in the bone marrow and primarily produce antibodies as part of humoral immunity. Neurons and the digestive system are not lymphocytes and don't fit the description. Therefore, the term that denotes this thymus-influenced, cell-mediated lymphocyte is T lymphocyte.

2. Which term describes single-celled microorganisms that are often aggregated into colonies or motile by means of flagella, typically live in soil, water, organic matter, or the bodies of plants and animals, autotrophic, saprophytic, or parasitic in nutrition, and noted for their biochemical effects and pathogenicity?

A. Bacillus

B. Bacteria

C. Metabolic Syndrome

D. Risk Factor

Bacteria are single-celled, prokaryotic organisms that often form colonies or move using flagella. They inhabit soil, water, decomposing matter, and the bodies of plants and animals. Their nutritional modes include autotrophy, saprophytism, and parasitism, and they are known for a wide range of biochemical activities and for their ability to cause disease. This description points to the general group of microorganisms, not a specific genus. A genus like Bacillus is a member of this group, while Metabolic Syndrome and Risk Factor are clinical terms, not organisms.

3. A specialized mass of conducting cells located at the atrioventricular junction in the heart.

A. Sinoatrial Node

B. Bundle of His

C. Purkinje fibers

D. Atrioventricular Node

The atrioventricular node is a key relay point in the heart's electrical system, located at the junction between the atria and ventricles. It receives the impulse from the sinoatrial node and introduces a brief delay so the atria can finish contracting and filling the ventricles before the signal proceeds. This pause is essential for coordinated heartbeat. After the delay, the impulse moves onward through the bundle of His and then the Purkinje fibers to activate the ventricles. The AV node also has a slower inherent firing rate, which allows it to act as a backup pacemaker if the primary pacemaker fails. The other structures have different locations and roles: the sinoatrial node is in the right atrium and is the primary pacemaker, the bundle of His conducts impulses through the interventricular septum, and the Purkinje fibers distribute the impulse throughout the ventricles.

4. A simple graphical way of discovering all potential genotype combinations given parents' genotypes?

A. Genome

B. Punnett Square

C. Pedigree

D. Karyotype

The method used to lay out all possible offspring genotypes from parental alleles is the Punnett square. It's a simple grid where one parent's possible gametes appear across the top and the other parent's appear along the side. By filling each cell with the combination of the two gametes, you can quickly see every potential genotype the offspring could have and estimate the probabilities for each. This works well for a single gene with two alleles, and you can expand the grid for more complex crosses to visualize genotype and phenotype chances. Other options don't fit this purpose: a genome is the organism's entire genetic material, a pedigree traces inheritance across generations in a family, and a karyotype shows chromosome number and structure. None provide the straightforward grid to enumerate all possible offspring genotypes from given parental genotypes.

5. Which term is used to describe a genetic variation detected by differences in fragment lengths after restriction enzyme digestion?

A. Thymine

B. Autopsy

C. Restriction Fragment Length Polymorphisms (RFLPs)

D. Glucagon

The key idea is that DNA sequence differences can create different fragment patterns after a restriction enzyme cuts the DNA. Restriction enzymes cleave DNA at specific sequences, so if a mutation changes one of those sites, the lengths of the resulting fragments will differ. When these fragments are run on a gel, the pattern of lengths varies between individuals, revealing a genetic variation. This type of variation is called Restriction Fragment Length Polymorphisms, or RFLPs. The other terms listed don't describe this concept: thymine is a nucleotide base, autopsy is a postmortem examination, and glucagon is a hormone.

6. Which term describes a liquid that is a homogeneous mixture of two or more substances?

A. Hydrophobic

B. Solvent

C. Solution

D. Anticodon

A liquid that is a homogeneous mixture of two or more substances is called a solution. In a solution, one substance (the solute) is dissolved in another (the solvent), producing a uniform composition throughout the liquid. This uniformity is what defines a solution, distinguishing it from mixtures that aren't evenly mixed. Hydrophobic describes a tendency to repel water, not the nature of a mixture. The solvent is the liquid that dissolves the solute, but the overall liquid that forms is the solution. An anticodon is a genetic term related to tRNA and translation, not to mixtures. For example, salt dissolved in water creates a saline solution.

7. What term describes the basic unit of life that makes up all living organisms?

A. Molecule

B. Organ

C. Cell

D. Tissue

Cells are the basic unit of life that makes up all living organisms. A cell is the smallest unit capable of performing the essential life processes—metabolism, growth, response to the environment, and reproduction. In all organisms, life is organized around cells; some organisms are single cells, while others are made up of many cells that specialize to form tissues and organs. Molecules are chemical building blocks, but they don't function as independent life units; tissues are groups of similar cells, and organs are made of tissues. Therefore, the term that best describes the basic unit of life is cell.

8. Which term describes the building block of nucleic acids?

A. Nucleotide

B. Monomer

C. Monosaccharide

D. Amino Acid

Nucleic acids are polymers built from repeating units called nucleotides. Each nucleotide contains a sugar, a phosphate group, and a nitrogenous base, and linkages between the sugars and phosphates form the backbone of the DNA or RNA strand. Because a nucleotide is the specific unit that makes up nucleic acids, it is the correct term for the building block. A monomer is a general term for the single unit that makes up any polymer, so it's related but not as specific to nucleic acids. A monosaccharide is the building block of carbohydrates, and an amino acid is the building block of proteins.

9. What term describes any of the branching muscular and elastic-walled vessels that carry blood from the heart to the body?

A. Artery

B. Vein

C. Aorta

D. Capillary

Arteries are the vessels that carry blood away from the heart. They have thick, muscular walls and a high content of elastic tissue in their walls, which lets them withstand the strong pressure generated by each heartbeat and recoil to help propel blood forward. As they move away from the heart, arteries branch into smaller arteries and arterioles, delivering blood to tissues throughout the body. The aorta is just the largest example of an artery, but the term described in the question refers to this whole category of branching muscular and elastic-walled vessels. Veins, by contrast, return blood to the heart and have thinner walls with valves, while capillaries are the tiny one-cell-thick vessels where exchanges with tissues occur.

10. Which lipoprotein particle carries more cholesterol and is linked to increased risk of heart disease when elevated?

A. Lipoprotein(a)

B. Low Density Lipoprotein (LDL)

C. Chylomicron

D. High Density Lipoprotein (HDL)

Lipoproteins differ in what they carry and how they affect arterial health. LDL carries a large portion of the cholesterol in the bloodstream and delivers it to cells through LDL receptors. When LDL is elevated, more cholesterol accumulates in the arterial walls, promoting the formation of atherosclerotic plaques and increasing the risk of heart attack and other cardiovascular events. In contrast, HDL helps remove cholesterol from arteries and is generally protective, while chylomicrons mainly transport dietary triglycerides and are cleared after meals. Lipoprotein(a) is an LDL-like particle with an extra apolipoprotein; it's a separate risk factor, but the primary cholesterol carrier whose elevation most strongly links to heart disease is LDL.

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://principlesofbiomedw.examzify.com

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