

SCIENCE ENTRANCE PRACTICE EXAM (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 term describes the mass of a substance per unit volume?**
 - A. Volume
 - B. Density
 - C. Weight
 - D. Mass
- 2. Which simple machine operates around a fixed point known as a fulcrum?**
 - A. Wheel
 - B. Lever
 - C. Pulley
 - D. Screw
- 3. What organelle is responsible for protein synthesis?**
 - A. Golgi apparatus
 - B. Ribosome
 - C. Lysosome
 - D. Chloroplast
- 4. What term refers to the body's use of food for energy production, tissue growth, and repair?**
 - A. Anabolism
 - B. Metabolism
 - C. Digestion
 - D. Homeostasis
- 5. What are the building blocks of proteins?**
 - A. Fatty acids
 - B. Sugars
 - C. Amino acids
 - D. Nucleotides

- 6. Which structure carries materials from outside to the inside of the cytoplasm?**
- A. Cell wall
 - B. Vesicles/Vacuoles
 - C. Cytoskeleton
 - D. Golgi apparatus
- 7. What is the main component of plant cell walls?**
- A. Cellulose
 - B. Chitin
 - C. Peptidoglycan
 - D. Starch
- 8. What is the speed of light in a vacuum?**
- A. Approximately 150,000 kilometers per second
 - B. Approximately 299,792 kilometers per second
 - C. Approximately 300,000 kilometers per second
 - D. Approximately 450,000 kilometers per second
- 9. Proteins that are made of repeating units of amino acids are called what?**
- A. Enzymes
 - B. Carbohydrates
 - C. Polypeptides
 - D. Proteins
- 10. What is thermal energy?**
- A. The energy that comes from the kinetic movement of air
 - B. The energy that comes from the temperature of matter
 - C. The energy stored within chemical bonds
 - D. The energy from gravitational forces

Answers

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

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Explanations

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1. What term describes the mass of a substance per unit volume?

- A. Volume
- B. Density**
- C. Weight
- D. Mass

The term that describes the mass of a substance per unit volume is density. Density is mathematically defined as the mass of an object divided by its volume ($\text{density} = \text{mass}/\text{volume}$). It provides a way to quantify how much matter is packed into a given space, which is essential for understanding properties of materials in various scientific disciplines. For example, knowing the density of a substance allows scientists to differentiate between materials, predict whether objects will float or sink in a fluid, and determine how mass changes as a substance changes state (like ice melting to water). Density is a fundamental property used across many fields, including physics, chemistry, and engineering, to analyze and manipulate materials—making it a vital concept in science.

2. Which simple machine operates around a fixed point known as a fulcrum?

- A. Wheel
- B. Lever**
- C. Pulley
- D. Screw

The lever is a type of simple machine that consists of a rigid bar that rotates around a fixed point called a fulcrum. The lever is used to amplify force or change the direction of an applied force. When a force is applied on one end of the lever, it creates a moment around the fulcrum, allowing a heavier load to be lifted with less effort on the opposite end. This principle is utilized in various tools and devices, such as seesaws, crowbars, and scissors. In contrast, a wheel operates on a different principle, as it rotates around an axle rather than a fulcrum. A pulley also helps change the direction of a force but involves a wheel and a rope system rather than a single bar pivoting around a point. The screw, while a simple machine as well, functions by converting rotational motion into linear motion and does not operate around a fulcrum. Thus, the lever distinctly embodies the fundamental characteristics of a simple machine that utilizes a fulcrum for operation.

3. What organelle is responsible for protein synthesis?

- A. Golgi apparatus
- B. Ribosome**
- C. Lysosome
- D. Chloroplast

The ribosome is the organelle responsible for protein synthesis. Ribosomes are found in both prokaryotic and eukaryotic cells and play a crucial role in translating messenger RNA (mRNA) into polypeptide chains, which then fold into functional proteins. They achieve this by linking amino acids together in the sequence specified by the mRNA. Ribosomes can either be bound to the endoplasmic reticulum (forming rough ER) or float freely in the cytoplasm. This versatility allows them to synthesize proteins that are destined for different locations within the cell or outside of it. The process of protein synthesis at the ribosome is fundamental to cellular function, as proteins perform a wide array of functions, including structural roles, enzymatic activity, and signaling. Other organelles such as the Golgi apparatus are involved in modifying, sorting, and packaging proteins for secretion or for use within the cell, while lysosomes are responsible for breaking down waste materials and cellular debris. Chloroplasts are involved in photosynthesis in plant cells, converting light energy into chemical energy. None of these organelles are directly responsible for the synthesis of proteins, which is why the ribosome is identified as the correct answer.

4. What term refers to the body's use of food for energy production, tissue growth, and repair?

- A. Anabolism
- B. Metabolism**
- C. Digestion
- D. Homeostasis

The term that describes the body's use of food for energy production, tissue growth, and repair is metabolism. Metabolism encompasses the entire set of chemical reactions that occur in the body to convert food into energy, synthesize necessary compounds, and break down substances for elimination. It includes two main components: catabolism, which is the breakdown of molecules to generate energy, and anabolism, which involves the building up of components like proteins and nucleic acids for tissue growth and repair. Understanding metabolism is crucial because it highlights how the body transforms the nutrients obtained from food into fuel for physical activities, maintains cellular functions, and supports overall health and recovery processes. This concept not only integrates energy use but also encompasses the intricate balancing act that allows organisms to thrive and repair damaged tissues effectively.

5. What are the building blocks of proteins?

- A. Fatty acids
- B. Sugars
- C. Amino acids**
- D. Nucleotides

Proteins are macromolecules that play critical roles in various biological processes, and their building blocks are amino acids. There are 20 different amino acids that combine in various sequences to form proteins. Each amino acid consists of a central carbon atom, an amino group, a carboxyl group, a hydrogen atom, and a unique side chain (or R group) that determines the properties of the amino acid. When amino acids link together through peptide bonds, they form polypeptides, which then fold into specific three-dimensional structures, leading to the formation of functional proteins. The sequence of amino acids in a protein is determined by the genetic code, which is transcribed from DNA and translated into a specific protein. This process is fundamental to all living organisms since proteins perform a wide range of functions, including catalyzing metabolic reactions, providing structural support, and facilitating communication between cells. The other choices represent different types of biomolecules: fatty acids are building blocks of lipids, sugars are carbohydrates, and nucleotides are the basic units of nucleic acids like DNA and RNA. Each has its own distinct roles in biological systems, but they do not serve as the building blocks of proteins.

6. Which structure carries materials from outside to the inside of the cytoplasm?

- A. Cell wall
- B. Vesicles/Vacuoles**
- C. Cytoskeleton
- D. Golgi apparatus

The structure that carries materials from outside to the inside of the cytoplasm is indeed vesicles/vacuoles. These cellular components are essential for transporting various substances. Vesicles are small membrane-bound sacs that can enclose materials such as proteins, nutrients, or waste products, allowing them to be transported into the cell from the external environment. When a cell needs to take in materials, vesicles can form through a process called endocytosis. During this process, a part of the cell membrane engulfs the material from outside the cell, and then pinches off to form a vesicle within the cytoplasm. This mechanism is critical for nutrient uptake, signaling molecules, and other essential materials that cells require to function. In contrast, cell walls provide structural support and protection to the cell but do not play a role in transporting materials into the cytoplasm. The cytoskeleton helps maintain the shape of the cell and aids in the movement of the cytoplasm and organelles but does not directly transport external materials. The Golgi apparatus is involved in modifying, sorting, and packaging proteins and lipids for secretion or delivery to other organelles but does not create vesicles that transport materials from outside the cell. Thus, vesicles/vacuoles are the

7. What is the main component of plant cell walls?

- A. Cellulose**
- B. Chitin
- C. Peptidoglycan
- D. Starch

The main component of plant cell walls is cellulose. Cellulose is a complex carbohydrate made up of long chains of glucose molecules linked together. This polysaccharide provides structural support and rigidity to the cell wall, enabling plants to maintain their shape and withstand various stresses, such as gravity and wind. In plants, cellulose forms microfibrils, which are small, thread-like structures that bundle together to create a robust scaffold. This structure is crucial for the plant's growth and overall functionality, as it helps prevent cell collapse and offers protection against pathogens. The other components mentioned, such as chitin, peptidoglycan, and starch, serve different roles in various organisms. For instance, chitin is primarily found in the exoskeletons of insects and the cell walls of fungi, peptidoglycan is a key structural component of bacterial cell walls, and starch serves as an energy storage polysaccharide in plants. This context highlights why cellulose is the correct choice for the primary component in plant cell walls.

8. What is the speed of light in a vacuum?

- A. Approximately 150,000 kilometers per second
- B. Approximately 299,792 kilometers per second**
- C. Approximately 300,000 kilometers per second
- D. Approximately 450,000 kilometers per second

The speed of light in a vacuum is approximately 299,792 kilometers per second. This value is significant because it represents one of the fundamental constants of nature, often denoted by the symbol "c". The speed of light is crucial in various fields of physics, particularly in the theory of relativity where it establishes the upper limit for the speed at which information and matter can travel. Moreover, the precision of this value is important for calculations in astrophysics and cosmology, as it impacts our understanding of the universe's structure and the behavior of electromagnetic waves. Being aware that light speed in vacuum is about 300,000 kilometers per second is also a common approximation used in many scientific discussions, rounding it for simplicity while retaining a close relationship to the more accurate figure. This value differs markedly from the other choices listed, which either understate or misrepresent the true speed of light.

9. Proteins that are made of repeating units of amino acids are called what?

- A. Enzymes
- B. Carbohydrates
- C. Polypeptides
- D. Proteins**

The correct answer refers to the structure of proteins, which are indeed made up of long chains of amino acids linked together by peptide bonds. When we talk about "repeating units of amino acids," we are specifically discussing polypeptides, which are the chains formed when amino acids are joined together in this manner. Proteins can be thought of as a higher-level organization of polypeptides; they may consist of one or more polypeptide chains that are folded into a specific three-dimensional shape, which is crucial for their biological function. Each protein's unique sequence of amino acids ultimately dictates its structure and function. While enzymes are a specific type of protein that catalyze biochemical reactions, carbohydrates are a distinct class of biomolecules completely unrelated to amino acids. Therefore, the term "protein" does encompass polypeptides, but it refers more broadly to the final functional molecules formed from these chains. Understanding the relationship between polypeptides and proteins helps to clarify why the answer is framed in the context of proteins composed of amino acids.

10. What is thermal energy?

- A. The energy that comes from the kinetic movement of air
- B. The energy that comes from the temperature of matter**
- C. The energy stored within chemical bonds
- D. The energy from gravitational forces

Thermal energy refers to the energy that arises from the temperature of matter, specifically the kinetic energy of the particles that compose that matter. As the temperature increases, the particles move more vigorously, leading to an increase in thermal energy. This energy is a result of the random motion of atoms and molecules within a substance, which directly relates to its temperature. For example, when you heat water, the thermal energy causes the water molecules to move faster, eventually leading to changes such as boiling. Thus, thermal energy is closely associated with the state and temperature of matter. The other options relate to different types of energy. The energy from the kinetic movement of air refers to wind energy, energy stored in chemical bonds refers to chemical energy, and energy from gravitational forces relates to gravitational potential energy. Each of these forms of energy operates under different principles and contexts, distinguishing them from the concept of thermal energy.

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:

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

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