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.

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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 process is directly facilitated by chlorophyll in plants?**
   - A. Transpiration
   - B. Nitrogen fixation
   - C. Photosynthesis
   - D. Cellular respiration

2. **Which process facilitates the genetic diversity seen in sexually reproducing organisms?**
   - A. Asexual reproduction
   - B. Fission
   - C. Sporulation
   - D. Fertilization

3. **What is the role of enzymes in biological processes?**
   - A. Store energy
   - B. Facilitate chemical reactions
   - C. Provide structural support
   - D. Transport nutrients

4. **What is the SI unit of force?**
   - A. Newton
   - B. Joule
   - C. Pascal
   - D. Watt

5. **What is a pure substance that cannot be broken down by chemical means?**
   - A. Compound
   - B. Element
   - C. Mixture
   - D. Ion

6. **Which force opposes motion between two surfaces that are in contact?**
   - A. Friction
   - B. Gravity
   - C. Drag
   - D. Pressure

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7. What type of compounds are characterized by the absence of carbon?

A. Organic compounds
B. Inorganic compounds
C. Biochemical compounds
D. Polyatomic compounds

8. What is the powerhouse of the cell?

A. Nucleus
B. Ribosome
C. Mitochondria
D. Endoplasmic reticulum

9. What is the primary function of excretion in biological systems?

A. Elimination of metabolic wastes
B. Production of energy
C. Growth and development
D. Regulation of body temperature

10. What type of reproduction requires the union of male and female gametes?

A. Asexual reproduction
B. External fertilization
C. Sexual reproduction
D. Budding

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Answers

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

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Explanations

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1. Which process is directly facilitated by chlorophyll in plants?

A. Transpiration

B. Nitrogen fixation

C. Photosynthesis

D. Cellular respiration

Chlorophyll is the green pigment found in the chloroplasts of plant cells and is crucial for the process of photosynthesis. During photosynthesis, chlorophyll absorbs light energy, primarily from the sun, and converts it into chemical energy. This process uses carbon dioxide and water to produce glucose and oxygen. The energy captured by chlorophyll enables the conversion of solar energy into chemical energy, which is vital for the plant's growth and sustenance. Transpiration involves the movement of water vapor from within the plant to the atmosphere and is not directly facilitated by chlorophyll. Nitrogen fixation is the process by which certain bacteria convert nitrogen gas from the atmosphere into a form usable by plants. While important for plant nutrition, it does not involve chlorophyll. Cellular respiration is the process by which cells convert glucose and oxygen into energy, carbon dioxide, and water; although it occurs in all living cells, including those of plants, chlorophyll does not play a direct role in this process. Thus, the role of chlorophyll is explicitly tied to photosynthesis, making it the correct answer.

2. Which process facilitates the genetic diversity seen in sexually reproducing organisms?

A. Asexual reproduction

B. Fission

C. Sporulation

D. Fertilization

Fertilization is the correct choice, as it plays a crucial role in creating genetic diversity among sexually reproducing organisms. During fertilization, the genetic material from two parents combines to form a new organism. This process involves the fusion of gametes – sperm and egg – which each carry unique genetic information. When these gametes combine, they create a zygote with a new genetic makeup distinct from either parent. This mixing of parental genes introduces variations in traits, which is essential for evolution and adaptation within populations. The genetic diversity generated through fertilization enables sexually reproducing organisms to develop different characteristics, some of which may provide advantages in changing environments. In contrast, processes like asexual reproduction and fission lead to offspring that are genetically identical to the parent, and sporulation generally results in the production of spores that can develop into new organisms but does not enhance genetic diversity in the same way. Thus, fertilization is key to facilitating genetic diversity in sexually reproducing organisms.

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3. What is the role of enzymes in biological processes?

A. Store energy

B. Facilitate chemical reactions

C. Provide structural support

D. Transport nutrients

Enzymes are biological catalysts that play a crucial role in facilitating chemical reactions within living organisms. They accelerate the rate of reactions by lowering the activation energy required for those reactions to occur. This means that enzymes make it easier for substrates, the reactants in enzymatic reactions, to convert into products. Without enzymes, many biochemical reactions would happen at an impractically slow rate to sustain life. Enzymes are specific to their substrates, meaning each enzyme typically catalyzes a specific reaction or type of reaction. This specificity is essential in the regulation of metabolic pathways, ensuring that the right reactions occur at the right times and in the right amounts. Additionally, enzymes can be influenced by various factors such as temperature, pH, and the concentration of substrates, which can affect their activity and efficiency. This dynamic regulation allows enzymes to respond to the needs of the cell and help maintain homeostasis. In summary, the primary role of enzymes in biological processes is to facilitate chemical reactions, making them indispensable for metabolism and other critical cellular functions.

4. What is the SI unit of force?

A. Newton

B. Joule

C. Pascal

D. Watt

The SI unit of force is the Newton. This unit is defined in terms of mass, distance, and time based on Newton's second law of motion, which states that the force acting on an object is equal to the mass of that object multiplied by its acceleration (F = ma). In the SI system, one Newton is equivalent to the force required to accelerate a mass of one kilogram at a rate of one meter per second squared. This definition helps to standardize the measurement of force in scientific contexts, ensuring consistency and clarity in calculations involving motion. Other options represent units of measurement related to different physical quantities: Joule is the unit of energy, Pascal is the unit of pressure, and Watt is the unit of power. These units are distinct from force and serve specific purposes in their respective areas of physics.

5. What is a pure substance that cannot be broken down by chemical means?

A. Compound

B. Element

C. Mixture

D. Ion

A pure substance that cannot be broken down by chemical means is defined as an element. Elements are fundamental substances that consist of one type of atom and are represented on the periodic table. They cannot be decomposed into simpler substances by chemical reactions, which distinguishes them from compounds, which are made up of two or more different elements bonded together and can be broken down into those constituent elements through chemical processes. Mixtures, on the other hand, contain two or more substances physically combined and can be separated by physical means; they do not represent pure substances. Ions, while charged particles that can be part of compounds or elements, are not pure substances themselves but rather representations of atoms or molecules that have gained or lost electrons. Thus, only elements fit the criterion of being pure substances that cannot be chemically broken down.

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6. Which force opposes motion between two surfaces that are in contact?

A. Friction

B. Gravity

C. Drag

D. Pressure

Friction is the force that opposes the motion of two surfaces that are in contact. This force arises due to the interactions between the molecules of the surfaces, which can create resistance to any sliding or movement between them. When one surface attempts to slide over another, friction acts in the opposite direction, hindering that movement. There are different types of friction, such as static friction, which prevents motion from starting, and kinetic friction, which acts on moving objects. The magnitude of friction depends on the nature of the surfaces in contact as well as the normal force pressing them together. Understanding friction is crucial in various applications, from designing tires for cars to controlling the movement of mechanical parts in machines. Other forces listed, such as gravity, drag, and pressure, serve different functions. Gravity pulls objects toward the center of the Earth, drag is the resistance encountered by objects moving through a fluid, and pressure does not directly oppose motion between surfaces. Instead, pressure refers to the force applied perpendicular to the surface area and is related to the interactions of forces rather than motion resistance. This makes friction the appropriate choice for a force that opposes motion between two surfaces in contact.

7. What type of compounds are characterized by the absence of carbon?

A. Organic compounds

B. Inorganic compounds

C. Biochemical compounds

D. Polyatomic compounds

Inorganic compounds are characterized by the absence of carbon, making this a key defining feature. Unlike organic compounds, which are primarily based on carbon and its bonds with hydrogen, oxygen, nitrogen, and other elements, inorganic compounds encompass a wide range of substances that do not fit this carbon-centric definition. Common examples of inorganic compounds include salts, minerals, and metals, many of which are essential to biological processes but do not contain carbon. Biochemical compounds, while related to biological functions, still include many organic compounds that are carbon-based. Polyatomic compounds refer to molecules that contain more than one atom, which can be organic or inorganic based on whether they contain carbon. Therefore, the characteristics and definitions of inorganic and organic compounds are fundamental in distinguishing between these two large classes of matter.

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8. What is the powerhouse of the cell?

A. Nucleus

B. Ribosome

C. Mitochondria

D. Endoplasmic reticulum

The mitochondria are often referred to as the "powerhouse of the cell" because they are the organelles responsible for producing adenosine triphosphate (ATP), the main energy currency of the cell. Through a process known as cellular respiration, mitochondria convert biochemical energy from nutrients into ATP, which cells use to power various metabolic processes. The inner membrane of the mitochondria is highly folded into structures called cristae, which increase the surface area available for chemical reactions essential to energy production. Additionally, mitochondria are unique among organelles in that they contain their own DNA and can replicate independently, which reflects their evolutionary history as once free-living prokaryotic organisms. In contrast, the nucleus is primarily involved in storing and protecting the cell's genetic material, ribosomes are the sites of protein synthesis, and the endoplasmic reticulum plays a crucial role in protein and lipid synthesis and transport within the cell. While all these organelles are essential to cell function, it is the mitochondria that are specifically designated for energy production, solidifying their title as the cell's powerhouse.

9. What is the primary function of excretion in biological systems?

A. Elimination of metabolic wastes

B. Production of energy

C. Growth and development

D. Regulation of body temperature

The primary function of excretion in biological systems is the elimination of metabolic wastes. During metabolism, organisms break down nutrients to produce energy, which results in the formation of various waste products such as carbon dioxide, water, urea, and other nitrogenous wastes. If these metabolic wastes are not efficiently removed from the body, they can accumulate to toxic levels and disrupt normal cellular functions. Excretion helps to maintain homeostasis, which is the stable internal environment necessary for the optimal functioning of cells. The processes involved in excretion usually include the kidneys filtering blood to remove waste products, the skin aiding in waste removal through sweat, and the lungs expelling carbon dioxide. This efficient removal is essential for overall health, allowing organisms to thrive by carefully balancing the substances within their bodies. In contrast to the other functions listed, such as energy production, growth and development, or regulation of body temperature, excretion specifically focuses on waste removal, making it a critical process for sustaining life.

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10. What type of reproduction requires the union of male and female gametes?

A. Asexual reproduction

B. External fertilization

C. Sexual reproduction

D. Budding

Sexual reproduction is characterized by the fusion of male and female gametes, known as fertilization. In this process, the male gamete (sperm) and the female gamete (egg) combine to form a zygote, which then develops into a new organism. This method introduces genetic diversity, as the offspring have a unique combination of genes from both parents, which can enhance adaptability and survival in changing environments. In the context of the options provided, asexual reproduction does not involve gametes and typically results in offspring that are genetically identical to the parent organism. External fertilization is a method that can occur during sexual reproduction but specifically refers to the situation where fertilization occurs outside the body, commonly seen in many aquatic organisms. Budding is a form of asexual reproduction where a new organism develops from a part of the parent organism, independent of gametes. Therefore, sexual reproduction is the accurate term for the process that requires the union of male and female gametes.

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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:

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

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