

INTEGRATED SCIENCE AND TECHNOLOGY (ISAT) EXAM 3 PRACTICE (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. What is transpiration in plants?

- A. The process of photosynthesis in leaves
- B. The movement of nutrients from roots to leaves
- C. The loss of water vapor through pores in leaves
- D. The absorption of water from the soil

2. What does the law of conservation of mass state?

- A. Mass can be created or destroyed in chemical reactions
- B. Mass in a closed system cannot be created or destroyed; it can only change forms
- C. Mass is always conserved in open systems
- D. The total mass of reactants always equals total mass of products in every reaction

3. What role does ozone play in protecting life on Earth?

- A. It provides oxygen for respiration
- B. It absorbs carbon dioxide
- C. It protects against harmful UV rays
- D. It helps in weather formation

4. Which of the following factors does NOT influence climate?

- A. Longitude
- B. Elevation
- C. Latitude
- D. Prevailing winds

5. What is a genetic mutation?

- A. A change in RNA structure
- B. A modification in protein structure
- C. A variation in the DNA sequence
- D. An alteration in the carbohydrate structure

- 6. An example of a renewable resource is:**
- A. Coal
 - B. Oil
 - C. Solar energy
 - D. Natural gas
- 7. What is the target global temperature increase outlined in the Paris Agreement?**
- A. 1.5 degrees Celsius
 - B. 2 degrees Celsius
 - C. 3 degrees Celsius
 - D. 4 degrees Celsius
- 8. What is the order of the substances in the air from least abundant to most abundant?**
- A. O₃, CO₂, Ar, O₂, N₂
 - B. Ar, O₃, CO₂, N₂, O₂
 - C. CO₂, O₃, N₂, O₂, Ar
 - D. O₂, CO₂, Ar, N₂, O₃
- 9. What substance is mainly responsible for the depletion of the ozone layer?**
- A. Carbon dioxide
 - B. Chlorofluorocarbons (CFCs)
 - C. Ozone
 - D. Sulfur dioxide
- 10. What is the primary outcome of cellular respiration?**
- A. Production of glucose and oxygen
 - B. Conversion of glucose and oxygen into ATP
 - C. Release of carbon dioxide and water
 - D. Transformation of ATP into glucose

Answers

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

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Explanations

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1. What is transpiration in plants?

- A. The process of photosynthesis in leaves
- B. The movement of nutrients from roots to leaves
- C. The loss of water vapor through pores in leaves**
- D. The absorption of water from the soil

Transpiration in plants is defined as the loss of water vapor through pores in leaves, specifically through structures known as stomata. This process is essential for maintaining the plant's water balance and plays a critical role in nutrient uptake and temperature regulation. When water evaporates from the leaf surface, it creates a negative pressure that helps pull water, along with dissolved nutrients, upward from the roots through the xylem. This not only aids in cooling the plant on hot days but also promotes nutrient transport and photosynthesis by creating a steady flow of water and minerals from the soil to the leaves. The other choices represent different processes that, while important in plant biology, do not accurately describe transpiration. Photosynthesis is the process by which plants convert sunlight into energy through chlorophyll in the leaves. Nutrient movement from roots to leaves involves different physiological mechanisms that do not specifically relate to the vapor loss aspect of transpiration. Absorption of water from the soil is the initial step in a plant's water uptake process but is distinct from the transpiration process itself, which focuses on water vapor loss rather than water absorption.

2. What does the law of conservation of mass state?

- A. Mass can be created or destroyed in chemical reactions
- B. Mass in a closed system cannot be created or destroyed; it can only change forms**
- C. Mass is always conserved in open systems
- D. The total mass of reactants always equals total mass of products in every reaction

The law of conservation of mass states that mass in a closed system cannot be created or destroyed; it can only change forms. This principle underlines the idea that during any chemical reaction, the mass of the reactants must equal the mass of the products. This means that atoms are merely rearranged when substances react, rather than being created or annihilated. In a closed system, all matter remains contained, and as reactions occur, the total quantity of matter (and thus mass) remains constant. This is a foundational principle in chemistry, supporting the understanding that chemical reactions do not alter the total mass involved. Recognizing this concept is crucial for correctly interpreting reactions and understanding stoichiometry, as well as for various scientific applications where mass balance is vital.

3. What role does ozone play in protecting life on Earth?

- A. It provides oxygen for respiration
- B. It absorbs carbon dioxide
- C. It protects against harmful UV rays**
- D. It helps in weather formation

Ozone plays a crucial role in protecting life on Earth primarily by absorbing harmful ultraviolet (UV) radiation from the sun. The ozone layer, located in the stratosphere, acts as a protective shield, filtering out a significant portion of the UV radiation that could otherwise reach the Earth's surface. Excessive exposure to UV rays can lead to a variety of health issues, including skin cancer, cataracts, and weakened immune systems, as well as detrimental effects on ecosystems and wildlife. While oxygen is necessary for respiration, it is not provided by ozone; rather, breathable oxygen is primarily the result of photosynthesis. Additionally, ozone does not play a direct role in absorbing carbon dioxide, which is a greenhouse gas involved in climate regulation. As for weather formation, while ozone does influence atmospheric dynamics, its primary function in the context of life protection is its ability to absorb UV radiation. Thus, the role of ozone in filtering UV rays is vital for maintaining the health of living organisms and the integrity of the environment.

4. Which of the following factors does NOT influence climate?

- A. Longitude**
- B. Elevation
- C. Latitude
- D. Prevailing winds

Longitude does not directly influence climate in the same way that the other factors listed do. Climate is primarily affected by various geographical and environmental factors that dictate temperature, precipitation patterns, and seasonal changes. Elevation plays a critical role in climate because temperature typically decreases as altitude increases, resulting in different climatic conditions at higher elevations compared to sea level. Latitude is essential as it determines the angle of sunlight received at different locations, affecting temperature and seasonal variation; areas closer to the equator experience warmer climates while polar regions are much colder. Prevailing winds also significantly influence climate by transporting air masses, moisture, and heat across different regions, which can lead to varying weather patterns. Thus, while longitude provides important information about location, it does not inherently affect climate the way elevation, latitude, and prevailing winds do.

5. What is a genetic mutation?

- A. A change in RNA structure
- B. A modification in protein structure
- C. A variation in the DNA sequence**
- D. An alteration in the carbohydrate structure

A genetic mutation refers to a variation in the DNA sequence that can occur in many forms, such as substitutions, insertions, or deletions of nucleotides. These changes at the molecular level can affect the genetic information encoded in the DNA, potentially leading to alterations in traits or functions manifested in an organism. Genetic mutations are significant because they can contribute to the diversity of genes within a population, which is essential for evolution and adaptation. The options provided include unrelated concepts or involve other biomolecules. Changes in RNA structure typically pertain to processes like transcription or splicing, while modifications in protein structure deal with post-translational modifications rather than changes in the genetic code itself. Alterations in carbohydrate structure relate to sugars and polysaccharides, which are not classified as genetic mutations. Hence, the correct choice accurately encapsulates the essence of what a genetic mutation is by focusing on its basis in DNA sequence variation.

6. An example of a renewable resource is:

- A. Coal
- B. Oil
- C. Solar energy**
- D. Natural gas

Solar energy is considered a renewable resource because it is harnessed from the sun, which is a powerful and abundant source of energy that is replenished constantly as it is generated through nuclear fusion in the sun's core. Unlike fossil fuels, such as coal, oil, and natural gas, which take millions of years to form and are finite resources, solar energy is sustainable and can be utilized for various applications, such as electricity generation, heating, and powering vehicles, without depleting the resource. The other options—coal, oil, and natural gas—are classified as non-renewable resources. These fossil fuels are formed from the remains of ancient plants and animals over geological time scales and are being depleted faster than they can naturally regenerate. Their extraction and use also contribute to environmental challenges, including greenhouse gas emissions and habitat destruction.

7. What is the target global temperature increase outlined in the Paris Agreement?

- A. 1.5 degrees Celsius**
- B. 2 degrees Celsius
- C. 3 degrees Celsius
- D. 4 degrees Celsius

The target global temperature increase outlined in the Paris Agreement is set at 1.5 degrees Celsius. This ambitious goal aims to limit the rise in average global temperature to well below 2 degrees Celsius above pre-industrial levels and pursue efforts to limit the increase to 1.5 degrees Celsius. Achieving this target is critical for reducing the risks and impacts of climate change, as exceeding this temperature threshold could lead to severe environmental consequences, such as more frequent and intense extreme weather events, rising sea levels, and significant disruptions to ecosystems. The Paris Agreement represents a collective commitment by countries to take actions towards mitigating climate change, enhancing adaptive capacity, and fostering sustainable development while pursuing efforts to achieve this stringent temperature goal.

8. What is the order of the substances in the air from least abundant to most abundant?

- A. O3, CO2, Ar, O2, N2**
- B. Ar, O3, CO2, N2, O2
- C. CO2, O3, N2, O2, Ar
- D. O2, CO2, Ar, N2, O3

To determine the correct order of the substances in the air from least abundant to most abundant, it's important to understand the composition of Earth's atmosphere. The major constituents of dry air are nitrogen (N₂), which makes up about 78% of the atmosphere, and oxygen (O₂), which accounts for about 21%. Argon (Ar) is present in much smaller amounts, roughly 0.93%. Carbon dioxide (CO₂) is even less abundant, currently around 0.04% and is increasing due to human activities. Ozone (O₃) is found in trace amounts, typically around 0.000006% in the atmosphere. Arranging these gases from least abundant to most abundant, we get: 1. Ozone (O₃) - extremely low concentration 2. Carbon dioxide (CO₂) - low concentration, but higher than O₃ 3. Argon (Ar) - more abundant than CO₂ 4. Oxygen (O₂) - the second most abundant gas 5. Nitrogen (N₂) - the most abundant gas in the atmosphere. The correct order of these substances from least to most abundant is indeed O₃, CO₂, Ar, O₂, N₂. This

9. What substance is mainly responsible for the depletion of the ozone layer?

- A. Carbon dioxide
- B. Chlorofluorocarbons (CFCs)**
- C. Ozone
- D. Sulfur dioxide

Chlorofluorocarbons (CFCs) are the primary substances responsible for the depletion of the ozone layer. CFCs are man-made compounds that were widely used in refrigeration, air conditioning, and aerosol propellants. When released into the atmosphere, CFCs rise up to the stratosphere, where they are broken down by ultraviolet (UV) radiation, releasing chlorine atoms. These chlorine atoms are highly reactive with ozone (O₃) molecules, leading to the destruction of ozone and consequently contributing to the thinning of the ozone layer. The ozone layer is crucial for life on Earth as it absorbs the majority of the sun's harmful UV radiation. The depletion of this layer increases UV exposure at ground level, which can lead to higher incidences of skin cancer, cataracts, and effects on ecosystems. In contrast, substances like carbon dioxide and sulfur dioxide have different roles. Carbon dioxide is mainly a greenhouse gas contributing to climate change, while sulfur dioxide can lead to air pollution and acid rain but does not have the same direct effects on the ozone layer. Ozone itself, while it is vital in the stratosphere, is the very substance that is being depleted by CFCs and is not a cause of depletion.

10. What is the primary outcome of cellular respiration?

- A. Production of glucose and oxygen
- B. Conversion of glucose and oxygen into ATP**
- C. Release of carbon dioxide and water
- D. Transformation of ATP into glucose

The primary outcome of cellular respiration is the conversion of glucose and oxygen into ATP. This process is crucial for providing energy to cells in the form of adenosine triphosphate (ATP), which is used for various cellular functions and activities. During cellular respiration, glucose is broken down through a series of metabolic pathways including glycolysis, the Krebs cycle, and the electron transport chain. In the presence of oxygen, this process efficiently generates ATP. The transformation of chemical energy stored in glucose into a readily usable form of energy (ATP) is the fundamental purpose of cellular respiration. While carbon dioxide and water are indeed produced as byproducts during the process, the main objective is to produce ATP for energy. The other options do not accurately capture the primary goal of cellular respiration, as glucose and oxygen are substrates used up in the process rather than outcomes, and ATP is not transformed back into glucose in this context.

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://isatexam3.examzify.com>

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

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