

DIVE INTEGRATED CHEMISTRY AND PHYSICS (ICP) QUARTERLY EXAM 3 PRACTICE (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE

<https://diveicpquarterly3.examzify.com>



Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	16

SAMPLE

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

SAMPLE

- 1. Which type of lever has the fulcrum located between the effort and resistance forces?**
 - A. First-class lever
 - B. Second-class lever
 - C. Third-class lever
 - D. Compound lever
- 2. What term describes the distance between the threads of a screw, affecting its mechanical advantage?**
 - A. Pitch
 - B. Gear ratio
 - C. Torque
 - D. Voltage
- 3. In the context of solutions, what is a solute?**
 - A. The liquid portion of a solution
 - B. The substance dissolved in a solution
 - C. The container holding the solution
 - D. The combination of solute and solvent
- 4. What is the mechanical advantage of a wedge primarily due to?**
 - A. The sharpness of its edge
 - B. The angle of its inclined planes
 - C. The material it's made of
 - D. The length of the wedge
- 5. According to the law of moments, how is balance achieved in a lever?**
 - A. The weight times distance from the fulcrum must be equal.
 - B. The effort force must equal the resistance force.
 - C. The fulcrum must be in the center of the lever.
 - D. The torque must be minimized.

- 6. What method uses the force exerted by light hitting a sail to propel an object in space?**
- A. Aerodynamics
 - B. Solar sailing
 - C. Gravitational slingshot
 - D. Thermal propulsion
- 7. What is the major product produced by mitochondria?**
- A. Carbon dioxide
 - B. Oxygen
 - C. ATP
 - D. Glucose
- 8. What occurs when a substance undergoes a chemical change?**
- A. The physical state remains the same
 - B. A new substance is formed
 - C. Only the appearance changes
 - D. Energy is not involved
- 9. What is defined as the movement of an object from one place to another, particularly in relation to its starting location and final location?**
- A. Speed
 - B. Displacement
 - C. Distance
 - D. Velocity
- 10. What is the significance of activation energy in a chemical reaction?**
- A. It is the maximum energy of the products
 - B. It is the energy needed for reactants to undergo a reaction
 - C. It defines the equilibrium state of a reaction
 - D. It determines the color of the reactants

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Which type of lever has the fulcrum located between the effort and resistance forces?

- A. First-class lever**
- B. Second-class lever
- C. Third-class lever
- D. Compound lever

The type of lever that has the fulcrum located between the effort and resistance forces is indeed the first-class lever. In this configuration, the load and effort are on opposite sides of the fulcrum. This arrangement allows for a mechanical advantage, depending on the distances from the fulcrum to the points where the effort and resistance are applied. Common examples of first-class levers include seesaws and scissors, where the fulcrum is centrally positioned between the two forces. The design of a first-class lever enables balance and movement by allowing a smaller effort force to move a larger load force when applied at an appropriate distance from the fulcrum. Second-class levers have the load located between the fulcrum and the effort, which provides different mechanical advantages. Third-class levers, conversely, have the effort applied between the fulcrum and the load, making them less efficient in terms of mechanical advantage but beneficial for increased range of motion or speed in the output. A compound lever consists of two or more simple levers working together, but it does not fit the specific description given in the question.

2. What term describes the distance between the threads of a screw, affecting its mechanical advantage?

- A. Pitch**
- B. Gear ratio
- C. Torque
- D. Voltage

The term that describes the distance between the threads of a screw is "pitch." The pitch specifically refers to the spacing between the threads, which directly influences how far the screw will advance with each complete turn. A screw with a finer pitch will require more rotations to cover the same linear distance compared to a screw with a coarser pitch. This characteristic affects the mechanical advantage the screw provides; specifically, a screw with a greater pitch offers a different force advantage compared to one with a smaller pitch. Understanding pitch is crucial for applications involving screws because it relates to how effectively they can convert rotational motion into linear motion, ultimately impacting the effort required to drive the screw into a material. In contrast, the other options do not pertain specifically to the distance between threads of a screw. Gear ratio deals with the relationship between gears, torque refers to the rotational force, and voltage relates to electrical potential, none of which are relevant to the concept of screw pitch.

3. In the context of solutions, what is a solute?

- A. The liquid portion of a solution
- B. The substance dissolved in a solution**
- C. The container holding the solution
- D. The combination of solute and solvent

In the context of solutions, a solute is defined as the substance that is dissolved in a solvent to form a solution. This means that when you mix a solute with a solvent, the solute particles distribute evenly throughout the solvent, creating a homogeneous mixture. For example, when you dissolve table salt in water, the salt acts as the solute and the water is the solvent. Understanding the role of the solute is key in studying solutions since it affects properties like concentration, boiling point, and freezing point. The interaction between the solute and the solvent is crucial in many chemical processes and applications, such as reactions, extractions, and separations. The other options refer to different aspects of solutions: the liquid portion is the solvent, the container is where the solution is held, and the combination of solute and solvent is simply the resulting solution. Each of these terms is important, but they do not accurately describe the specific definition of a solute.

4. What is the mechanical advantage of a wedge primarily due to?

- A. The sharpness of its edge
- B. The angle of its inclined planes**
- C. The material it's made of
- D. The length of the wedge

The mechanical advantage of a wedge is primarily due to the angle of its inclined planes. This angle affects how effectively the wedge can convert the applied force into a useful output force, allowing it to split or lift objects with less effort. When the angle is smaller, the wedge can more easily push through materials, utilizing the force applied over a longer distance, which translates to a greater advantage. The sharpness of its edge does help in reducing the effort needed to penetrate the material, but it is not the primary source of mechanical advantage. The material the wedge is made of can influence its durability and how well it performs, yet it does not inherently change the mechanical principles at play. The length of the wedge can affect how much distance is covered when force is applied but again is not the main factor determining the mechanical advantage — that factor lies in the angle of the inclined planes.

5. According to the law of moments, how is balance achieved in a lever?

- A. The weight times distance from the fulcrum must be equal.**
- B. The effort force must equal the resistance force.
- C. The fulcrum must be in the center of the lever.
- D. The torque must be minimized.

Balance in a lever is achieved according to the law of moments through the relationship between the weights on either side of the fulcrum and their respective distances from that fulcrum. Specifically, when an object is balanced on a lever, the moments or torques created by the weights must be equal on both sides of the fulcrum. The moment is calculated by multiplying the weight of an object (force due to gravity) by its distance from the fulcrum, known as the lever arm. When this multiplication results in equal values on both sides, the lever remains in balance. For instance, if you have a weight of 5 kg placed 2 meters from the fulcrum on one side, you would need a weight of 2.5 kg placed 4 meters from the fulcrum on the other side to achieve balance, since both moments would equal 10 kg·m. The other choices do not accurately depict the principle governing balance in a lever system. The requirement for the effort force to equal the resistance force does not consider the distances involved. Placing the fulcrum in the center may not result in balance if the weights are not also appropriately distributed. Lastly, minimizing torque does not adhere to the balance principle.

6. What method uses the force exerted by light hitting a sail to propel an object in space?

- A. Aerodynamics
- B. Solar sailing**
- C. Gravitational slingshot
- D. Thermal propulsion

The method that utilizes the force exerted by light on a sail to propel an object in space is solar sailing. This innovative propulsion technique relies on the momentum transfer from photons—light particles—when they strike a specially designed reflective sail. As light from the sun or other stars reflects off the sail, it creates a force that pushes the spacecraft forward, allowing it to gradually gain speed in the vacuum of space without the need for conventional fuel. Solar sailing takes advantage of the fact that light, although it has no mass, carries momentum. The larger the sail, the more photons it can catch, and consequently, the more force it can generate, making it an efficient method of propulsion for long-duration space missions. This technology has the potential to enable spacecraft to travel vast distances by harnessing solar energy, which is a renewable resource in space. The other methods listed do not relate to the propulsion mechanism described. Aerodynamics pertains to the behavior of air and how it interacts with solid objects, which is not applicable in the vacuum of space. Gravitational slingshots involve using the gravitational field of a planet to gain speed and change direction, while thermal propulsion relies on the expansion of heated gases to create thrust. Each of these definitions highlights why they

7. What is the major product produced by mitochondria?

- A. Carbon dioxide
- B. Oxygen
- C. ATP**
- D. Glucose

Mitochondria are often referred to as the "powerhouses" of the cell because their primary function is to generate adenosine triphosphate (ATP), which is the main energy currency of cells. During cellular respiration, mitochondria break down fuel molecules such as glucose in the presence of oxygen, facilitating a series of biochemical processes that ultimately lead to the production of ATP. This process not only provides energy for various cellular activities but also generates byproducts, primarily carbon dioxide and water. While carbon dioxide is indeed produced during cellular respiration, it is not the major product; rather, it is a waste product that is exhaled. Oxygen, on the other hand, is used in the process of aerobic respiration rather than being produced by mitochondria. Glucose serves as the substrate for ATP production but is not a product generated by mitochondria during cellular respiration. Thus, ATP stands out as the major product resulting from the metabolic activities of mitochondria, highlighting their role in energy production within the cell.

8. What occurs when a substance undergoes a chemical change?

- A. The physical state remains the same
- B. A new substance is formed**
- C. Only the appearance changes
- D. Energy is not involved

When a substance undergoes a chemical change, a new substance is formed. This transformation involves a rearrangement of atoms and bonds, which results in different chemical properties from those of the original substance. Chemical changes are often accompanied by observable signs such as color changes, gas production, or the formation of a precipitate, all indicating that new substances have been created as a result of the chemical reactions. In contrast, a physical change, which is not applicable here, would involve changes that do not alter the substance's chemical identity—things like changes in state (solid to liquid), changes in shape or size, or alterations in appearance, without changing the composition of the matter. The physical state remaining the same or only the appearance changing does not capture the essence of a chemical change, as these processes do not result in new substances being created. Additionally, energy is often involved in chemical changes, either absorbed or released, such as in exothermic and endothermic reactions, which further distinguishes chemical changes from mere physical alterations. Thus, the key aspect of a chemical change is the formation of new substances due to the transformation of chemical bonds and composition.

9. What is defined as the movement of an object from one place to another, particularly in relation to its starting location and final location?

- A. Speed
- B. Displacement**
- C. Distance
- D. Velocity

Displacement is defined as the change in position of an object from its starting location to its final location, taking into account both the distance and direction of this movement. Unlike distance, which measures the total path traveled without considering direction, displacement focuses specifically on the shortest path from the initial position to the final position, represented as a straight line with a specific direction. For instance, if an object moves in a circular path but returns to its starting point, the distance traveled may be significant, but the displacement is zero, since there is no change in position. In contrast, if an object moves from one point to another in a straight line, the displacement reflects that change in position, making it an essential concept in understanding motion in physics.

10. What is the significance of activation energy in a chemical reaction?

- A. It is the maximum energy of the products
- B. It is the energy needed for reactants to undergo a reaction**
- C. It defines the equilibrium state of a reaction
- D. It determines the color of the reactants

Activation energy is a crucial concept in understanding chemical reactions, as it represents the minimum energy required for reactants to transform into products. This energy barrier must be overcome for the reaction to proceed, meaning that without sufficient activation energy, reactants cannot successfully collide and react to form products. This concept plays a key role in determining reaction rates; higher activation energy generally indicates a slower reaction since fewer molecules will possess the required energy to overcome this barrier at a given temperature. Additionally, temperature can influence the number of molecules that have enough energy to surpass the activation energy threshold, thereby affecting reaction rates and mechanisms. The other options address concepts that do not relate directly to activation energy. For instance, the maximum energy of the products pertains to the overall energy changes during a reaction, not the energy needed to initiate it. Similarly, equilibrium states relate to the balance of reactants and products, while the color of reactants is a physical property unrelated to energy requirements in a reaction. Thus, the significance of activation energy lies in its role as the threshold that must be surpassed for a chemical reaction to take place.

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://diveicpquarterly3.examzify.com>

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

SAMPLE