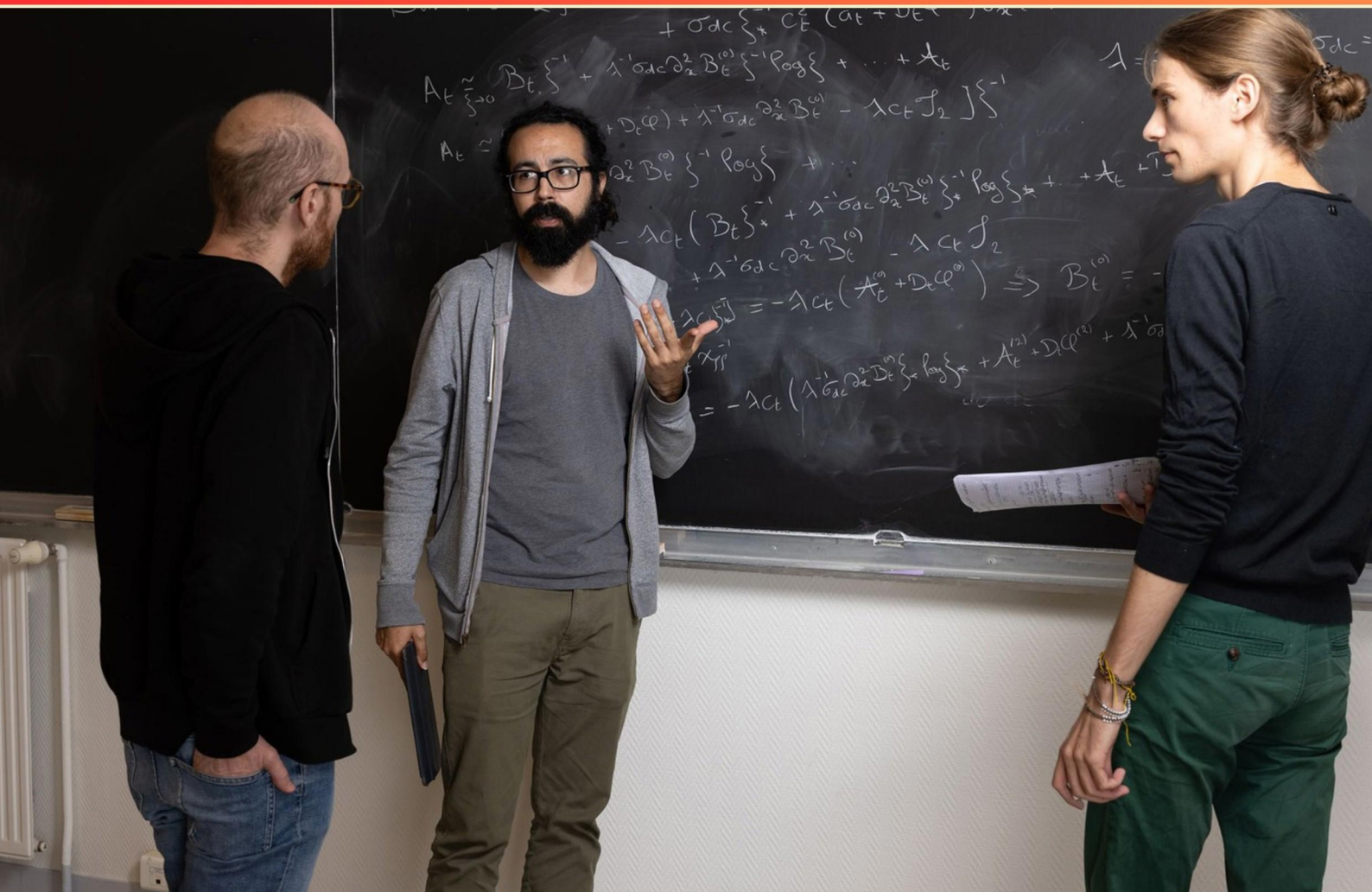


ARIZONA STATE UNIVERSITY (ASU) PHY101 INTRODUCTION TO PHYSICS PRACTICE EXAM (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
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. In the absence of force, how does a moving object behave?**
 - A. It comes to a stop
 - B. It continues to move in a straight line at a constant speed
 - C. It changes direction
 - D. It accelerates

- 2. If two ropes pull a stubborn stump with forces of 200N each, ranked by angle from smallest to largest, which configuration applies?**
 - A. $A > B > C$
 - B. $A > C > B$
 - C. $B > A > C$
 - D. $C > A > B$

- 3. What determines the air resistance experienced by a falling object?**
 - A. The shape and color of the object
 - B. The area of the object in relation to its weight
 - C. The height from which it is dropped
 - D. The temperature of the air

- 4. What does inertia refer to in physics?**
 - A. The resistance of an object to a change in its state of motion
 - B. The force of gravity on an object
 - C. The speed of an object
 - D. The acceleration due to a force

- 5. What principle is highlighted by the law of conservation of energy?**
 - A. Energy can be created
 - B. Energy can be destroyed
 - C. Energy is always conserved
 - D. Energy can be amplified

- 6. What is the magnitude of the gravitational field inside a hollow, spherical planet?**
- A. Varies throughout the planet
 - B. Equal to the gravitational field at the surface
 - C. Zero N/kg
 - D. Infinite N/kg
- 7. When lifting an object against gravity, what physical property are you measuring?**
- A. Mass
 - B. Weight
 - C. Volume
 - D. Inertia
- 8. What does Galileo's discovery signify about the relationship between mass and fall speed?**
- A. Heavier objects fall faster
 - B. All objects fall at the same rate regardless of mass
 - C. The force of wind affects falling speed
 - D. Only dense objects fall
- 9. What principle explains why all objects fall at the same rate in a vacuum?**
- A. Equal acceleration due to gravity
 - B. Different gravitational pull
 - C. Less air resistance
 - D. Inertia
- 10. According to the work-energy theorem, what does the parallel gravitational force component multiplied by distance equal?**
- A. Change in the ball's kinetic energy
 - B. Potential energy at rest
 - C. Work done against gravity
 - D. Gravitational force magnitude

Answers

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

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Explanations

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1. In the absence of force, how does a moving object behave?

- A. It comes to a stop
- B. It continues to move in a straight line at a constant speed**
- C. It changes direction
- D. It accelerates

A moving object in the absence of net force will continue to move in a straight line at a constant speed due to the principle of inertia. This concept is derived from Newton's first law of motion, which states that an object at rest will remain at rest, and an object in motion will continue in that state of uniform motion unless acted upon by an external force. In this scenario, since no forces are acting on the object, there is nothing to change its state of motion. Therefore, the object will maintain both its speed and direction, illustrating that it continues its trajectory without any alteration. Such behavior exemplifies the fundamental properties of how objects exhibit motion under inertial frames, reinforcing that forces are necessary to change an object's motion.

2. If two ropes pull a stubborn stump with forces of 200N each, ranked by angle from smallest to largest, which configuration applies?

- A. $A > B > C$
- B. $A > C > B$**
- C. $B > A > C$
- D. $C > A > B$

When analyzing the configuration of forces acting on the stump, it is essential to consider the angles at which the ropes are applied. If both ropes exert a force of 200 N but at different angles, the resultant force depends significantly on these angles. In choice B, the configuration indicates that angle A is less than angle C, and angle C is less than angle B. This means that the rope pulling at angle A contributes to a higher resultant force compared to the others because the components of force that act in the direction of the stump's displacement are maximized when the angle is minimized. Essentially, the steeper the angle (when comparing equal force magnitudes), the less that rope effectively contributes towards moving the stump. Thus, by ranking the angles in ascending order, we recognize that angle A has the smallest angle and thereby has the greatest effectiveness in contributing to the resultant force acting to pull the stump forward. As we progress to angle B, it has the largest angle, representing the least advantageous position for generating the pulling effect, while C fits somewhere in between, adding moderate effectiveness. Therefore, the configuration of angles A, C, and B aligns with the expected outcomes based on the principles of vector resolution in a two-dimensional scenario.

3. What determines the air resistance experienced by a falling object?

- A. The shape and color of the object
- B. The area of the object in relation to its weight**
- C. The height from which it is dropped
- D. The temperature of the air

The air resistance experienced by a falling object primarily depends on its shape and the area of the object relative to its mass, which influences how it interacts with the air as it falls. This concept can be understood through the physics of drag force, which is the resistive force that opposes the motion of an object through a fluid (in this case, air). The drag force can be mathematically expressed in terms of the object's cross-sectional area, its speed, and other fluid properties. A larger cross-sectional area typically results in greater air resistance because more air molecules are being displaced as the object moves downward. Additionally, the object's weight and shape also play a crucial role. For instance, a lightweight object with a large surface area (like a feather) will experience significant air resistance relative to its weight and fall slowly, whereas a heavier object with a smaller surface area (like a rock) will cut through the air more effectively and experience less significant resistance in comparison to its weight. Other factors mentioned in the choices, such as the height from which it is dropped or the temperature of the air, can have some influence on the speed at which an object falls, but they do not fundamentally determine the air resistance experienced by the object. The shape of an

4. What does inertia refer to in physics?

- A. The resistance of an object to a change in its state of motion**
- B. The force of gravity on an object
- C. The speed of an object
- D. The acceleration due to a force

Inertia is fundamentally defined as the property of an object that quantifies its resistance to changes in its state of motion, which includes changes in speed or direction. This concept is tightly linked to Newton's First Law of Motion, which states that an object at rest will remain at rest, and an object in motion will continue to move at a constant velocity unless acted upon by an external force. Essentially, the greater the mass of an object, the greater its inertia, making it more challenging to alter its motion. Understanding inertia helps explain why heavy objects are harder to push or stop compared to lighter ones. This characteristic is crucial in various applications in physics, such as understanding motion, designing safety mechanisms in vehicles, and predicting the behavior of objects in gravitational fields. The concept of inertia is a foundational principle in mechanics and is vital for analyzing motion in various physical scenarios.

5. What principle is highlighted by the law of conservation of energy?

- A. Energy can be created
- B. Energy can be destroyed
- C. Energy is always conserved**
- D. Energy can be amplified

The law of conservation of energy emphasizes that energy cannot be created or destroyed; it can only change forms. This means that the total energy of an isolated system remains constant over time, although the energy may transform from potential to kinetic energy, or even from one type (like thermal energy) to another (like mechanical energy). This principle is foundational in understanding how energy operates within various physical systems. In practical terms, when you perform work or when energy seems to dissipate as heat, the energy hasn't vanished; rather, it has transformed into another type of energy, thus preserving the total amount of energy within the system. This understanding is crucial in physics since it governs all energy interactions and transactions, from simple mechanical systems to complex biological and chemical processes.

6. What is the magnitude of the gravitational field inside a hollow, spherical planet?

- A. Varies throughout the planet
- B. Equal to the gravitational field at the surface
- C. Zero N/kg**
- D. Infinite N/kg

The magnitude of the gravitational field inside a hollow, spherical planet is indeed zero N/kg. This result stems from the application of Newton's law of universal gravitation and the shell theorem. The shell theorem states that a uniform spherical shell of mass exerts no net gravitational force on an object located inside it. Therefore, if you are anywhere within the hollow sphere, all the mass of the shell surrounding you exerts equal and opposite forces, resulting in a net gravitational field of zero. This principle highlights how the distribution of mass affects gravitational interactions. For example, if one were to analyze the gravitational effects at the surface of a hollow sphere, where the mass is distributed evenly about the center, the gravitational field would be non-zero, pointing towards the center. However, once you are inside the hollow section, that influence cancels out entirely—hence the gravitational field inside is zero. Understanding this concept is crucial for appreciating how gravitational fields work in non-uniform mass distributions and can help inform further studies in gravitational physics.

7. When lifting an object against gravity, what physical property are you measuring?

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

When lifting an object against gravity, you are measuring its weight. Weight is defined as the force exerted on an object due to gravity. It is calculated as the product of the object's mass and the acceleration due to gravity. Therefore, when you lift an object, the force you must exert to overcome gravitational pull is equal to its weight. Mass represents the amount of matter in an object and is a scalar quantity, meaning it does not change regardless of the object's location in a gravitational field. Volume is a measure of the space the object occupies and is unrelated to the force experienced while lifting. Inertia refers to an object's resistance to changes in its state of motion, which is related to mass but not to the force required to lift the object against gravitational pull. Thus, lifting an object involves overcoming its weight, making that the correct answer.

8. What does Galileo's discovery signify about the relationship between mass and fall speed?

- A. Heavier objects fall faster
- B. All objects fall at the same rate regardless of mass**
- C. The force of wind affects falling speed
- D. Only dense objects fall

Galileo's discovery fundamentally changed the understanding of how objects fall. He demonstrated through experimentation that all objects, regardless of their mass, fall at the same rate when air resistance is negligible. This means that in a vacuum, where there is no air to create drag, a heavier object does not fall faster than a lighter one; instead, they both accelerate towards the ground at the same rate due to gravity. This principle is counterintuitive because everyday experience might suggest that heavier objects should fall faster. However, Galileo's experiments, which included dropping different weights from the Leaning Tower of Pisa and rolling balls down inclined planes, provided empirical evidence to support the idea that gravitational acceleration is constant for all objects. Therefore, the understanding that all objects fall at the same rate, regardless of their mass, is foundational to classical mechanics and has been confirmed by subsequent experiments and observations, including those made in vacuum conditions.

9. What principle explains why all objects fall at the same rate in a vacuum?

- A. Equal acceleration due to gravity**
- B. Different gravitational pull
- C. Less air resistance
- D. Inertia

The principle that explains why all objects fall at the same rate in a vacuum is based on equal acceleration due to gravity. In a vacuum, there is no air resistance to affect the motion of falling objects. This means that regardless of their masses, all objects experience the same gravitational acceleration, which on Earth is approximately 9.81 m/s^2 . This phenomenon was famously demonstrated by Galileo, who showed that a heavier object does not fall faster than a lighter one when air resistance is eliminated. In a vacuum, the absence of air means that there are no external forces to act differently on objects of different weights. Therefore, they all fall at the same rate, demonstrating that the acceleration due to gravity is constant for all objects in the absence of air resistance. This fundamental concept is pivotal in understanding motion under gravity and forms the basis for many principles in physics regarding the behavior of objects in free fall.

10. According to the work-energy theorem, what does the parallel gravitational force component multiplied by distance equal?

- A. Change in the ball's kinetic energy**
- B. Potential energy at rest
- C. Work done against gravity
- D. Gravitational force magnitude

The work-energy theorem states that the work done on an object is equal to the change in its kinetic energy. When considering the parallel gravitational force component, it plays a crucial role in determining how much work is done when an object moves through a distance in the direction of that force, such as a ball rolling down a hill. When you multiply the parallel component of the gravitational force by the distance over which it acts, you are calculating the work done by that gravitational force. This work is what contributes to the change in the object's kinetic energy. As the object moves down, the gravitational force causes it to accelerate, leading to an increase in its kinetic energy. Thus, the correct relationship highlighted by the work-energy theorem directly ties the parallel gravitational force's action to the resultant change in kinetic energy of the object involved.

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://asu-phy101.examzify.com>

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

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