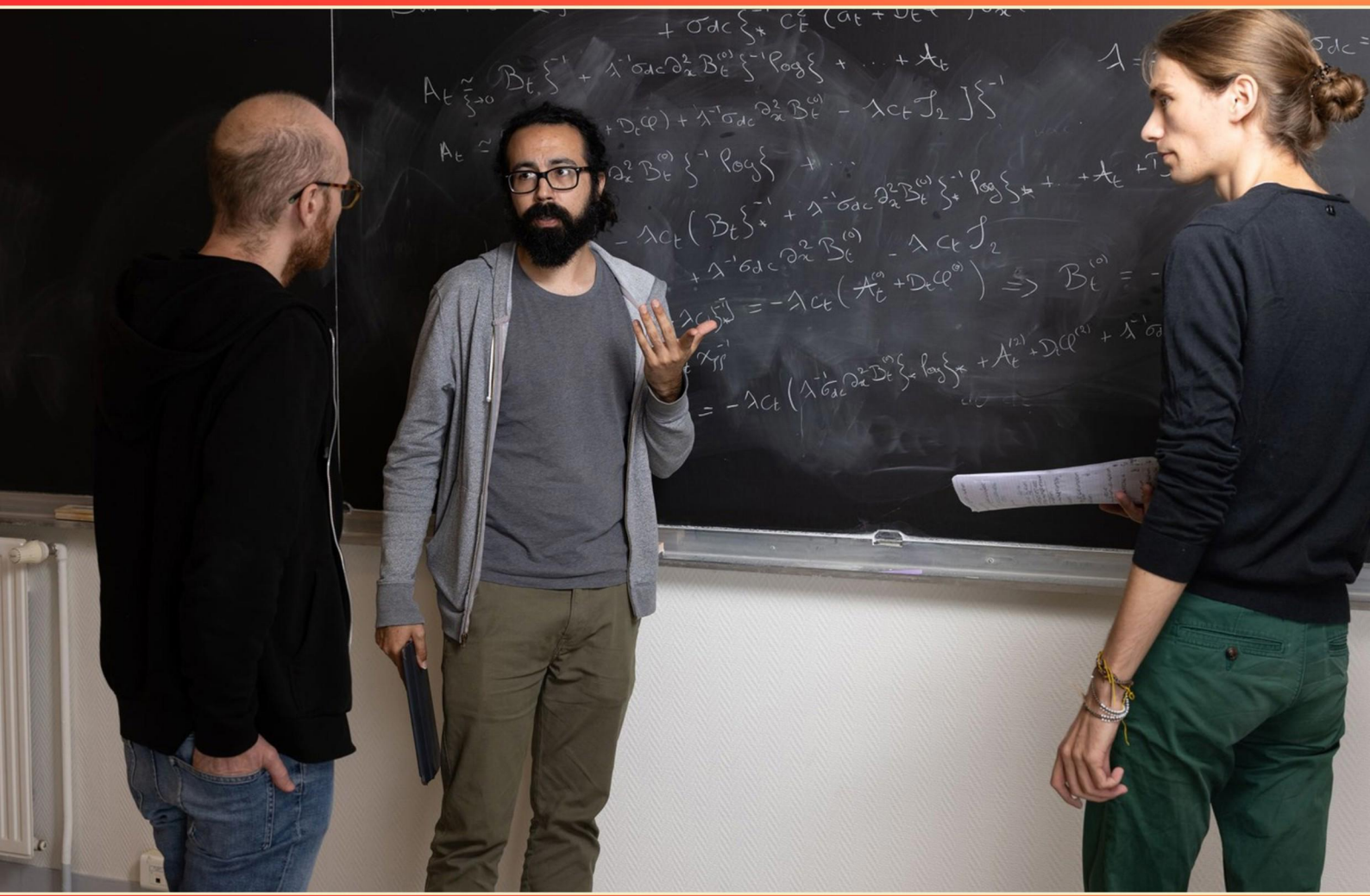
ARIZONA STATE UNIVERSITY (ASU) PHY101 INTRODUCTION TO PHYSICS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

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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

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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. What condition is necessary for potential energy to be negative, as seen in the example with the block?

A. When it is below the designated zero potential energy reference

B. When it is moving

C. When it has zero mass

D. When there is no energy input

2. When standing at rest on a bathroom scale, how does your weight relate to the support force from the scale?

A. Your weight is double the support force

B. Your weight is equal in magnitude and opposite in direction to the support force

C. Your weight is less than the support force

D. Your weight does not affect the support force

3. Which ball will be traveling faster when hitting the ground if both are dropped from the same height?

A. Ball 1

B. Ball 2

C. Both will hit at the same speed

D. It varies based on drag

4. What is the acceleration of a ball at the moment it has zero velocity during upward motion?

A. 0 m/s^2

B. 10 m/s^2

C. -10 m/s^2

D. 5 m/s^2

5. What formula gives the acceleration due to gravity on Loput, given its mass and radius?

A. g(2.1/0.80^2)

B. g(5.6/1.7^2)

C. g(12/2.8^2)

D. g(8.3/4.1^2)

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6. If net force acting on an object is zero, what can be concluded about its motion?

A. It must be accelerating

B. It must not be moving

C. It can be moving at a constant velocity

D. It is losing speed

7. Where along the journey between Earth and the Moon is the gravitational force Earth's spaceship exerts the strongest?

A. At midpoint between Earth and Moon

B. Closest to the Moon

C. Closest to Earth

D. Just past midpoint towards the Moon

8. What is the ultimate source of energy for fossil fuels, hydroelectric power, and wind power?

A. Earth's core

B. The Moon

C. The Sun

D. Geothermal heat

9. When else would your weight be greater than normal according to the motion described?

A. When the elevator moves downward without accelerating

B. When the elevator moves downward while slowing in speed

C. When the elevator descends quickly

D. When the elevator makes a stop

10. Which of the following best defines mechanical equilibrium?

A. A state of constant speed

B. A state of zero acceleration

C. A state where the forces acting on an object are balanced

D. All of the above

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Answers

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

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Explanations

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1. What condition is necessary for potential energy to be negative, as seen in the example with the block?

A. When it is below the designated zero potential energy reference

B. When it is moving

C. When it has zero mass

D. When there is no energy input

Potential energy is often defined relative to a designated reference point, typically where potential energy is considered to be zero. This reference point can vary depending on the system being analyzed, such as the height of an object above ground level or the position of a block in a gravitational field. When we say that potential energy is negative, we are typically referring to the situation where the object is located below that chosen reference level. For example, if the reference point is set at ground level and an object, like a block, is positioned below this level, then its gravitational potential energy will indeed be negative. This reflects the fact that the block is lower than the reference level, and hence, it would require energy input to raise it back up to that zero potential reference. In contrast, other conditions mentioned, such as when an object is moving, having zero mass, or lacking energy input, do not inherently dictate the sign of potential energy. Movement does not affect the potential energy's reference point, mass only affects the calculation of potential energy in terms of gravitational influence, and energy input is not directly related to defining the sign of potential energy itself. Thus, the correct condition for potential energy to be negative is indeed when it is below the designated zero potential energy

2. When standing at rest on a bathroom scale, how does your weight relate to the support force from the scale?

A. Your weight is double the support force

B. Your weight is equal in magnitude and opposite in direction to the support force

C. Your weight is less than the support force

D. Your weight does not affect the support force

When standing at rest on a bathroom scale, your weight is equal in magnitude and opposite in direction to the support force provided by the scale. This relationship is explained by Newton's Third Law of Motion, which states that for every action, there is an equal and opposite reaction. In this scenario, your weight acts downward due to gravity, exerting a force on the scale. The scale responds by exerting a support force upward that matches the gravitational force acting on you. Because you are at rest and not accelerating, these two forces are balanced. The static equilibrium condition—where the net force acting on you is zero—ensures that the upward support force from the scale is equal to your weight. Thus, the support force prevents you from accelerating downward, effectively counteracting your weight. This fundamental principle of forces explains why the correct answer indicates that your weight and the support force are equal in magnitude and opposite in direction.

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3. Which ball will be traveling faster when hitting the ground if both are dropped from the same height?

A. Ball 1

B. Ball 2

C. Both will hit at the same speed

D. It varies based on drag

When two objects are dropped from the same height in a vacuum (where air resistance is negligible), they will accelerate towards the ground at the same rate due to gravity, which is approximately 9.81 m/s² on Earth. This means that by the time they reach the ground, they will have the same velocity, regardless of their mass or size. This situation is based on the principle established by Galileo's experiments, which demonstrated that the acceleration due to gravity is constant and does not depend on the mass of the falling object. Therefore, both balls will hit the ground at the same speed when dropped from the same height. In real-world scenarios, factors such as air resistance could affect the speed at which objects fall, particularly for objects with significant drag (like a feather or a parachute), but if we assume minimal air resistance, the conclusion holds that both balls will indeed reach the ground at the same speed.

4. What is the acceleration of a ball at the moment it has zero velocity during upward motion?

A. 0 m/s^2

B. 10 m/s^2

C. -10 m/s^2

D. 5 m/s^2

When a ball is moving upward, it is subject to the force of gravity, which acts downward. At the moment the ball reaches its highest point, its velocity is zero, but it is important to note that gravity is still acting on it. The acceleration due to gravity near the surface of the Earth is approximately -10 m/s^2, indicating that the acceleration is directed downward, opposite to the direction of the ball's motion when it is going up. Because the question asks for the acceleration at the moment the ball has zero velocity, it's crucial to recognize that acceleration is not dependent on velocity; instead, it is determined by the forces acting on the object. Since gravity is continuously acting on the ball throughout its journey, even when the upward velocity is zero, the ball is still experiencing an acceleration of -10 m/s^2 due to the gravitational pull. Therefore, the correct answer reflects the consistent effect of gravity on the ball at the peak of its upward trajectory.

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5. What formula gives the acceleration due to gravity on Loput, given its mass and radius?

A. g(2.1/0.80^2)

B. g(5.6/1.7^2)

C. g(12/2.8^2)

D. g(8.3/4.1^2)

The correct formula for calculating the acceleration due to gravity on a celestial body, such as Loput, is derived from Newton's law of universal gravitation. The formula is: \[g = \frac{G \cdot M}{r^2} \] where \(g \) is the acceleration due to gravity, \(G \) is the gravitational constant, \(M \) is the mass of the celestial body, and \(r \) is its radius. In analyzing the question choices, each option presents a version of the gravitational acceleration scaled by \(g \), where the term in the parentheses represents a ratio of mass to the square of the radius. The goal is to ensure that the ratio of mass to radius squared aligns with the specific values provided. For the chosen answer, the mass of Loput is given as 5.6 and its radius is 1.7. According to the formula, the acceleration due to gravity would be proportional to \(\frac{5.6}{1.7^2} \). This aligns correctly with the fundamental principles of gravitation, confirming that this proportionality holds for Loput. Thus, when we compare the ratio's formula with the choices and notice that choice B clearly

6. If net force acting on an object is zero, what can be concluded about its motion?

A. It must be accelerating

B. It must not be moving

C. It can be moving at a constant velocity

D. It is losing speed

When the net force acting on an object is zero, it means that all the forces acting on the object are balanced. According to Newton's first law of motion, 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 a net external force. Therefore, if the net force is zero, the object is in a state of equilibrium. This scenario allows for two possibilities: the object may be stationary, or it may be moving at a constant velocity. Since the question asks for what can be concluded about its motion in the context of a net force of zero, it is correct to state that the object can indeed be moving at a constant velocity. Thus, the conclusion about the object's motion is that it can maintain its current state, whether that state is at rest or in uniform motion, as long as the net force remains zero.

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7. Where along the journey between Earth and the Moon is the gravitational force Earth's spaceship exerts the strongest?

A. At midpoint between Earth and Moon

B. Closest to the Moon

C. Closest to Earth

D. Just past midpoint towards the Moon

The gravitational force that a spaceship experiences from Earth is influenced by the distance between the spaceship and the Earth itself, as described by Newton's law of universal gravitation. According to this law, the gravitational force is inversely related to the square of the distance between two masses. Therefore, as the spaceship gets closer to Earth, the gravitational pull it experiences from Earth becomes stronger. When the spaceship is closest to Earth, this distance is minimized, resulting in the maximum gravitational attraction. As the spaceship travels away from Earth towards the Moon, the distance increases and, consequently, the gravitational pull decreases. The force of gravity from the Earth decreases as the spaceship moves away from it and increases again as it approaches. Hence, the strongest gravitational force exerted by Earth on the spaceship occurs when it is closest to Earth.

8. What is the ultimate source of energy for fossil fuels, hydroelectric power, and wind power?

A. Earth's core

B. The Moon

C. The Sun

D. Geothermal heat

The ultimate source of energy for fossil fuels, hydroelectric power, and wind power is the Sun. This connection can be understood by examining how each energy source is tied to solar energy. For fossil fuels, these resources are primarily formed from the remains of ancient plants and animals. Over millions of years, through processes involving heat and pressure, organic matter that originally obtained its energy through photosynthesis (a process powered by sunlight) transforms into coal, oil, and natural gas. Hence, the energy stored in fossil fuels can be traced back to the energy initially captured from the Sun. Hydroelectric power relies on the water cycle, which is driven by the Sun's energy. Solar energy causes evaporation of water from bodies of water, resulting in clouds and precipitation. When this rainwater flows into rivers and is harnessed by dams to generate electricity, it is indirectly utilizing the energy that originated from the Sun. Wind power is also ultimately derived from solar energy. Wind is caused by the uneven heating of the Earth's surface by the Sun. Areas that are heated more intensely will create differences in air pressure, causing air to move from regions of high pressure to low pressure, which we experience as wind. This movement of air can then be captured by wind turbines to produce

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9. When else would your weight be greater than normal according to the motion described?

A. When the elevator moves downward without accelerating

B. When the elevator moves downward while slowing in speed

C. When the elevator descends quickly

D. When the elevator makes a stop

Your weight is the force that gravity exerts on you, which is measured as your apparent weight depending on the acceleration of the system you're in, such as an elevator. When the elevator moves down while slowing in speed, it creates a scenario where you would feel heavier than your normal weight. During this motion, as the elevator decelerates, it creates an upward acceleration relative to your body's weight. This means that the force the scale exerts on you—your apparent weight—compensates not only for the gravitational pull but also for the additional upward force caused by the elevator's deceleration. Therefore, your total weight measured at this moment would be greater than the normal weight measured when the elevator is at rest or moving at a constant velocity. In contrast, in scenarios where the elevator moves downward without accelerating, descends quickly, or makes a stop, the forces at play do not contribute to an increase in your apparent weight. In those cases, either there's no additional force acting upwards against gravity or the forces would counteract in such a way that your weight remains normal or even feels lighter.

10. Which of the following best defines mechanical equilibrium?

A. A state of constant speed

B. A state of zero acceleration

C. A state where the forces acting on an object are balanced

D. All of the above

Mechanical equilibrium occurs when an object is in a state where the net forces acting upon it are balanced, resulting in no acceleration. This concept can be analyzed through several perspectives. When the forces are balanced, it implies that the object is either at rest or moving with a constant velocity, which means it has a constant speed with no change in its state of motion. Thus, even if the object's speed is constant, the absence of any resulting acceleration indicates that it is also in a state of zero acceleration. Fundamentally, the criteria for mechanical equilibrium encompasses all these definitions: the forces acting on the object are balanced, leading to a constant speed or zero acceleration. Therefore, stating that mechanical equilibrium includes a state of constant speed, zero acceleration, and balanced forces encompasses the whole concept appropriately. This comprehensive approach supports the idea that all the individual aspects contribute to a full understanding of mechanical equilibrium.

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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:

https://asu-phy101.examzify.com

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

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