

AC-HPAT PHYSICS PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE

<https://achpatphysics.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	15

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. Energy stored in a capacitor $C = 8 \text{ pF}$ charged to $V = 9 \text{ V}$. What is the energy?
 - A. $3.24 \times 10^{-10} \text{ J}$
 - B. $1.62 \times 10^{-10} \text{ J}$
 - C. $8.10 \times 10^{-11} \text{ J}$
 - D. $6.48 \times 10^{-10} \text{ J}$
2. According to Newton's Second Law, acceleration is related to force and mass in which way?
 - A. Acceleration is directly proportional to the applied force and inversely proportional to the mass
 - B. Acceleration is inversely proportional to both force and mass
 - C. Acceleration is equal to force times mass
 - D. Acceleration is independent of force
3. Heat energy is also known as what?
 - A. Energy transformation
 - B. Efficiency
 - C. Electric energy
 - D. Thermal energy
4. Using Ohm's Law, calculate the current when the voltage is 9 V and the resistance is 3Ω .
 - A. 1 A
 - B. 3 A
 - C. 9 A
 - D. 27 A
5. A hockey puck sliding on an ice rink is often described as motion that occurs with no continuous external force applied. This illustrates which concept?
 - A. Inertia
 - B. Torque
 - C. Centripetal force
 - D. Impulse

- 6. Which statement correctly describes the relationship between Conventional Current and Electron Flow?**
- A. Conventional Current flows from the positive to the negative terminal, while Electron Flow describes electrons moving from negative to positive.
 - B. Conventional Current describes electrons moving from negative to positive; Electron Flow describes positive charges moving from positive to negative.
 - C. Both describe the same direction of current.
 - D. Neither model is used in circuit analysis.
- 7. Which term describes the distance traveled per unit time regardless of direction?**
- A. Speed
 - B. Distance
 - C. Displacement
 - D. Position
- 8. Which description illustrates inertia in everyday terms?**
- A. A rock at rest remains at rest, and an object in motion, that does not encounter any friction, will keep moving
 - B. A rock at rest will begin to move spontaneously
 - C. An object in motion will always come to rest due to friction
 - D. A car will move faster without external forces
- 9. Stored energy due to an object's position is called what?**
- A. Energy transformation
 - B. Efficiency
 - C. Electric energy
 - D. Potential energy
- 10. On a brick sliding on a clean wooden table, the coefficient of kinetic friction is approximately which value?**
- A. 0.5
 - B. 1.0
 - C. 0.05
 - D. 2.0

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Energy stored in a capacitor $C = 8 \text{ pF}$ charged to $V = 9 \text{ V}$. What is the energy?

A. $3.24 \times 10^{-10} \text{ J}$

B. $1.62 \times 10^{-10} \text{ J}$

C. $8.10 \times 10^{-11} \text{ J}$

D. $6.48 \times 10^{-10} \text{ J}$

Energy stored in a capacitor is given by $U = \frac{1}{2} C V^2$. Convert the capacitance to farads: $8 \text{ pF} = 8 \times 10^{-12} \text{ F}$, and square the voltage: $V^2 = 9^2 = 81$. So $U = 0.5 \times (8 \times 10^{-12}) \times 81 = 0.5 \times 648 \times 10^{-12} = 324 \times 10^{-12} = 3.24 \times 10^{-10} \text{ J}$. This matches $3.24 \times 10^{-10} \text{ J}$. A common mistake is dropping the $1/2$ factor, which would give $6.48 \times 10^{-10} \text{ J}$.

2. According to Newton's Second Law, acceleration is related to force and mass in which way?

A. Acceleration is directly proportional to the applied force and inversely proportional to the mass

B. Acceleration is inversely proportional to both force and mass

C. Acceleration is equal to force times mass

D. Acceleration is independent of force

Newton's Second Law says how fast an object speeds up depends on the net force acting on it and its mass. The acceleration is proportional to the net force and inversely proportional to the mass, written as $a = F/m$ for constant mass. That means pushing harder increases acceleration, while carrying more mass reduces it. For example, doubling the force on the same mass doubles the acceleration, whereas doubling the mass with the same force halves the acceleration. The direction of acceleration matches the direction of the net force. If someone suggested it's inversely proportional to both force and mass, that would imply more force gives less acceleration, which isn't correct. If acceleration were force times mass, the units would not match and the relationship would be different from what we observe. If acceleration were independent of force, applying a force would have no effect, which contradicts everyday experience.

3. Heat energy is also known as what?

A. Energy transformation

B. Efficiency

C. Electric energy

D. Thermal energy

Heat is energy in transit due to a temperature difference, while thermal energy is the energy contained in a system from the microscopic motion and interactions of its particles. In everyday usage, "heat energy" often means the energy stored in a substance as a result of its temperature, which is precisely what thermal energy describes. When you add heat to a system, its thermal energy increases (temperature can rise, or a phase change can occur while energy goes into changing the state). When you remove heat, the thermal energy decreases. The other options aren't correct fits: energy transformation describes how energy changes forms, not a form of energy itself; efficiency is a ratio, not a kind of energy; electric energy is a specific form of energy tied to electric charges, not the general concept of heat energy. Therefore, thermal energy is the best answer.

4. Using Ohm's Law, calculate the current when the voltage is 9 V and the resistance is 3 Ω .

- A. 1 A
- B. 3 A**
- C. 9 A
- D. 27 A

Current is the rate at which electric charge flows, and Ohm's law links current to voltage and resistance with $I = V / R$. So the current equals the voltage divided by the resistance. With 9 V across 3 Ω , $I = 9 / 3 = 3$ A. A quick check: if 3 A flowed through 3 Ω , the voltage would be $I R = 3 \times 3 = 9$ V, which matches the given voltage. The other numbers don't fit because 1 A would yield only 3 V across 3 Ω , and 27 A would require about $1/3 \Omega$ to produce 9 V. Therefore, the current is 3 A.

5. A hockey puck sliding on an ice rink is often described as motion that occurs with no continuous external force applied. This illustrates which concept?

- A. Inertia**
- B. Torque
- C. Centripetal force
- D. Impulse

Inertia is the tendency of an object to keep moving with the same velocity in a straight line unless a net external force acts on it. When there's no continuous external force on the puck, the net force is essentially zero, so the acceleration is zero and its velocity remains constant. On ice, friction is small, so the puck glides at nearly constant speed in a straight path until something else—like a collision or a hockey stick—acts on it. The other ideas don't describe this situation as well. Torque would cause rotation if there were a twisting force. Centripetal force is needed to keep an object moving in a circle, which isn't the case here. Impulse is a short, brief force that changes momentum, not the ongoing absence of force.

6. Which statement correctly describes the relationship between Conventional Current and Electron Flow?

- A. Conventional Current flows from the positive to the negative terminal, while Electron Flow describes electrons moving from negative to positive.**
- B. Conventional Current describes electrons moving from negative to positive; Electron Flow describes positive charges moving from positive to negative.
- C. Both describe the same direction of current.
- D. Neither model is used in circuit analysis.

The relationship tested is about how we describe current versus how electrons actually move. Conventional Current is defined as the flow of positive charge, so it is taken to move from the positive terminal toward the negative terminal. Electron Flow is the actual motion of electrons, which are negatively charged, so they move from the negative terminal toward the positive terminal. This pairing matches how we analyze circuits: using the conventional direction (positive to negative) provides a fixed reference for applying Ohm's law and circuit laws. If you picture electrons moving, you'd just flip the implied direction of motion, and the math stays consistent as long as the sign conventions follow the chosen picture. The statement being correct says exactly that: conventional current goes from + to -, while electron flow goes from - to +. The other options mix up those directions or claim neither model is used, which isn't true—conventional current is the standard convention in circuit analysis, though electron flow can be used as an intuitive picture.

7. Which term describes the distance traveled per unit time regardless of direction?

- A. Speed
- B. Distance
- C. Displacement
- D. Position

Speed captures how fast something is moving without caring about which way it goes. It's a scalar quantity equal to distance traveled divided by time, so it only has magnitude. If the object changes direction, the speed can stay the same even though its motion is turning, because direction isn't part of speed. In contrast, velocity would include direction. Distance is the total path length traveled, not a rate; displacement is the straight-line separation from start to finish with direction; position is a specific location at a moment in time. So the term that fits "distance traveled per unit time regardless of direction" is speed.

8. Which description illustrates inertia in everyday terms?

- A. A rock at rest remains at rest, and an object in motion, that does not encounter any friction, will keep moving
- B. A rock at rest will begin to move spontaneously
- C. An object in motion will always come to rest due to friction
- D. A car will move faster without external forces

Inertia is the tendency of an object to resist changes to its motion. In everyday terms, a stationary thing stays put until something pushes or pulls it, and a moving thing would keep moving in a straight line at the same speed unless something slows it down or stops it. The description that matches this idea says a rock at rest stays at rest, and a moving object would keep moving if there were no friction slowing it down. That captures inertia by showing motion persists without an external force. The other statements imply that motion starts on its own, or that motion always stops due to friction, or that a car would speed up without a force—none of which align with inertia.

9. Stored energy due to an object's position is called what?

- A. Energy transformation
- B. Efficiency
- C. Electric energy
- D. Potential energy

Potential energy is energy stored because of an object's position or configuration in a field or structure. This energy sits waiting to do work as the position changes—for example, a mass raised above the ground has gravitational potential energy, and a stretched or compressed spring has elastic potential energy. When the position changes, that stored energy can convert to motion or other forms of energy. The other terms describe processes or different kinds of energy: energy transformation is just the act of changing energy from one form to another, efficiency is about how much useful work is produced from a given input, and electric energy refers to energy related to electric charges or fields rather than the general idea of stored energy due to position.

10. On a brick sliding on a clean wooden table, the coefficient of kinetic friction is approximately which value?

- A. 0.5
- B. 1.0
- C. 0.05
- D. 2.0

When an object slides on a horizontal surface, the frictional force opposing the motion is proportional to the normal force: $F_f = \mu_k N$. Here $N \approx mg$, so $F_f \approx \mu_k mg$. The kinetic friction coefficient μ_k thus determines how large the friction force is relative to the weight. For everyday solid-on-solid contact like a brick on a clean wooden table, μ_k is typically around 0.4 to 0.6, so about one-half is a good quick estimate. That means the friction force is roughly half the brick's weight, and the deceleration due to friction is $a = F_f/m \approx \mu_k g \approx 0.5 g \approx 4.9 \text{ m/s}^2$. Among common values, this vicinity to one-half best matches the real-world behavior of a brick sliding on clean wood. Values like 0.05 would be far too small (much smoother surface), while 1.0 or 2.0 would be much larger than typical for this pairing.

SAMPLE

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://achpatphysics.examzify.com>

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

SAMPLE