SQA HIGHER PHYSICS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://sqahigherphysics.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.

SAMPLE

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!

SAMPLE

Questions

SAMPLE

1. What are the characteristics of a wave?

A. Velocity, frequency, amplitude, and energy

B. Wavelength, color, amplitude, and temperature

C. Mass, speed, acceleration, and frequency

D. Velocity, density, pressure, and energy

2. What is the primary focus of quantum mechanics?

A. Large-scale physical systems

B. The behavior of matter and energy on small scales

C. Classical mechanics of moving objects

D. Thermodynamics of heat and work

3. Which principle states that the total electric charge in an isolated system remains constant over time?

A. Principle of conservation of energy

B. Principle of conservation of mass

C. Principle of conservation of charge

D. Principle of conservation of momentum

4. In physics, how is 'work' defined?

A. Work is the energy stored in an object

B. Work is done when a force moves an object in the direction of the force

C. Work is the amount of force applied to an object

D. Work is the energy required to lift an object

5. How do scalar quantities differ from vector quantities?

A. Scalar quantities have both magnitude and direction.

B. Vector quantities are always larger than scalar quantities.

C. Scalar quantities have only magnitude; vector quantities have both magnitude and direction.

D. Vector quantities can be measured only in one dimension.

SAMPLE

6. What is an open circuit characterized by?

A. No voltage supply

B. No current flowing through

C. No resistance measured

D. No energy storage

7. Which phenomenon describes the increase in time intervals as observed from a stationary reference point compared to a moving observer?

A. Time Dilation

B. Length Contraction

C. Relativity

D. Space Expansion

8. What is kinetic energy?

A. The energy possessed by an object due to its position

B. The energy possessed by an object due to its motion

C. The energy transferred when an object changes shape

D. The energy associated with the temperature of an object

9. What concept in quantum physics explains the dual behavior of particles like electrons?

A. Wave-particle duality

B. Electromagnetic radiation

C. Quantum tunneling

D. Heisenberg uncertainty principle

10. Which of the following is NOT a fundamental principle of quantum mechanics?

A. Wave-particle duality

B. Uncertainty principle

C. Newton's laws of motion

D. Quantization of energy

SAMPLE

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. What are the characteristics of a wave?

A. Velocity, frequency, amplitude, and energy

B. Wavelength, color, amplitude, and temperature

C. Mass, speed, acceleration, and frequency

D. Velocity, density, pressure, and energy

The characteristics of a wave include velocity, frequency, amplitude, and energy. Velocity refers to the speed at which a wave travels through a medium, which is crucial in determining how quickly information or energy is transmitted. Frequency is the number of complete cycles of the wave that pass a point in a given period, typically measured in Hertz (Hz). It is directly related to the energy carried by the wave; higher frequency waves generally carry more energy. Amplitude is the maximum displacement of points on a wave from its rest position, which is a measure of the energy level of the wave; larger amplitudes indicate more energy. Energy in the context of waves relates to how much work the wave can perform. For instance, in mechanical waves, greater amplitude usually corresponds to higher energy. The other options present characteristics that do not comprehensively describe waves. Wavelength and color relate to specific types of waves (like light), but do not capture the fundamental characteristics across all wave types. Mass does not apply to waves in the same way as it does to particles. Velocity, density, pressure, and energy are relevant in various contexts, such as fluid dynamics or thermodynamics, but do not specifically define wave characteristics as clearly as the first choice does.

2. What is the primary focus of quantum mechanics?

A. Large-scale physical systems

B. The behavior of matter and energy on small scales

C. Classical mechanics of moving objects

D. Thermodynamics of heat and work

The primary focus of quantum mechanics is indeed on the behavior of matter and energy on small scales, which is where classical physics fails to adequately describe physical phenomena. Quantum mechanics delves into the interactions and properties of particles such as atoms, electrons, and photons. It explores concepts like wave-particle duality and the uncertainty principle, which are fundamental to understanding how particles exist and behave at the quantum level. In contrast to classical mechanics, which is concerned with macroscopic objects and their motion, quantum mechanics is essential for explaining phenomena that occur at the atomic and subatomic levels. For example, it addresses how electrons occupy the discrete energy levels of an atom, and how particles can exhibit both wave-like and particle-like properties depending on the experimental situation. The other areas listed, such as large-scale physical systems, classical mechanics, and thermodynamics, focus on different aspects of physics that do not capture the intricacies of atomic behavior and quantum phenomena. Thus, the definitive domain of interest for quantum mechanics is the small-scale interactions of matter and energy.

SAMPLE

3. Which principle states that the total electric charge in an isolated system remains constant over time?

A. Principle of conservation of energy

B. Principle of conservation of mass

C. Principle of conservation of charge

D. Principle of conservation of momentum

The principle that states that the total electric charge in an isolated system remains constant over time is the principle of conservation of charge. This principle asserts that even though electric charges can be transformed from one form to another or can move from one part of the system to another, the overall quantity of charge remains unchanged. This means that in any process taking place in an isolated system, the sum of positive and negative charges will balance out to a constant value, ensuring that charge is neither created nor destroyed. This principle is foundational in understanding electric interactions and is crucial in fields such as electrostatics and circuit theory. In essence, it's a way to describe the behavior of electric charge in a coherent and predictable manner.

4. In physics, how is 'work' defined?

A. Work is the energy stored in an object

B. Work is done when a force moves an object in the direction of the force

C. Work is the amount of force applied to an object

D. Work is the energy required to lift an object

The definition of 'work' in physics is closely associated with the interaction of force and motion. Specifically, work is defined as the product of the force applied to an object and the distance that the object moves in the direction of the force. This means that for work to be done, there must be a displacement of the object in the same direction as the applied force. In this context, the correct answer emphasizes that work occurs when a force successfully causes an object to move along a path, and that movement must be in the same direction as the force for work to be calculated. This highlights the relationship between force, distance, and the direction of motion, encapsulated in the mathematical formula: Work = Force × Distance × cos(θ), where θ is the angle between the force and the direction of movement. This understanding is vital for evaluating real-world scenarios in physics, as it illustrates that if there is no movement or if the movement is perpendicular to the direction of the force, no work is done even though a force may have been applied.

SAMPLE

5. How do scalar quantities differ from vector quantities?

A. Scalar quantities have both magnitude and direction.

B. Vector quantities are always larger than scalar quantities.

C. Scalar quantities have only magnitude; vector quantities have both magnitude and direction.

D. Vector quantities can be measured only in one dimension.

Scalar quantities are defined as those that have only magnitude, meaning they can be described by a numerical value alone, such as temperature, mass, or time. In contrast, vector quantities possess both magnitude and direction, which means they require both a numerical value and a direction to fully describe them. For instance, a velocity of 60 km/h to the north is a vector quantity, as it indicates not just the speed but also the direction of travel. Understanding the distinction between these types of quantities is fundamental in physics because it affects how they are manipulated and combined in equations. Scalars can simply be added, subtracted, or multiplied as regular numbers, while vectors must consider both their magnitude and direction when performing the same operations. This foundational concept is critical in various physics applications, such as mechanics and electromagnetism, where understanding the interplay between magnitude and direction influences problem-solving and analysis.

6. What is an open circuit characterized by?

A. No voltage supply

B. No current flowing through

C. No resistance measured

D. No energy storage

An open circuit is characterized primarily by the condition of having no current flowing through it. This occurs when the circuit is incomplete due to a break in the connection, which prevents electric charge from moving along the intended path. In an open circuit, while there may still be voltage present across the ends of the circuit components, the lack of a complete path means that there is no flow of current, which is essential for any electrical operation to take place. In this situation, it's important to note that while there may be voltage, that doesn't result in current unless the circuit is closed. This differentiates an open circuit distinctly from a closed circuit, where current flows freely. The terms related to voltage supply, resistance, and energy storage do not capture the fundamental defining characteristic of an open circuit as clearly as the flow of current does. Hence, the absence of current is the definitive aspect that characterizes an open circuit.

SAMPLE

7. Which phenomenon describes the increase in time intervals as observed from a stationary reference point compared to a moving observer?

A. Time Dilation

B. Length Contraction

C. Relativity

D. Space Expansion

Time dilation is a key concept in the theory of relativity, which describes how time intervals can appear to differ for observers in different frames of reference. Specifically, when an observer is moving at a significant fraction of the speed of light relative to a stationary observer, the moving observer's clock ticks more slowly compared to the stationary observer's clock. This means that time observed from the stationary perspective will seem to stretch or dilate, leading to longer recorded time intervals. This phenomenon has been experimentally verified in various scenarios, such as in particle physics, where fast-moving particles exhibit longer lifetimes as seen from our frame of reference. It also plays a crucial role in understanding how GPS satellites, which move quickly compared to the surface of the Earth, require adjustments based on both special and general relativity to provide accurate positioning information. The other options relate to different concepts: length contraction involves objects appearing shorter in the direction of motion to a stationary observer, relativity is the overarching framework that encompasses both these ideas and more, while space expansion refers to the increase in distance between cosmic structures in the universe over time and is not directly tied to the effects of relative motion on time measurement.

8. What is kinetic energy?

A. The energy possessed by an object due to its position

B. The energy possessed by an object due to its motion

C. The energy transferred when an object changes shape

D. The energy associated with the temperature of an object

Kinetic energy is defined as the energy possessed by an object due to its motion. This form of energy is dependent on two key factors: the mass of the object and its velocity. The relationship is quantified by the formula $KE = \frac{1}{2} mv^2$, where m is the mass and v is the velocity of the object. The faster an object moves or the greater its mass, the more kinetic energy it possesses. This concept is fundamental in physics as it helps to explain how moving objects interact and exert forces upon one another. The other options address different energy concepts that do not pertain specifically to motion. For instance, energy due to position relates to potential energy, which refers to the stored energy of an object based on its position relative to other objects. Energy transferred during a change of shape refers to elastic potential energy, and energy associated with temperature pertains to thermal energy, which relates to the kinetic energy of particles in a substance but is not itself kinetic energy.

SAMPLE

9. What concept in quantum physics explains the dual behavior of particles like electrons?

A. Wave-particle duality

B. Electromagnetic radiation

C. Quantum tunneling

D. Heisenberg uncertainty principle

Wave-particle duality is a fundamental concept in quantum physics that describes how particles such as electrons exhibit properties of both particles and waves. This dual behavior is pivotal in understanding various phenomena in quantum mechanics. In particle-like behavior, electrons can be seen as discrete units, capable of being detected as individual entities with specific locations. Conversely, when considering their wave-like nature, electrons can demonstrate interference and diffraction patterns, which are characteristic of wave phenomena. This wave-particle duality is crucial for explaining several experimental results, such as the double-slit experiment, where electrons create an interference pattern that suggests they are behaving as waves rather than just as particles when not observed. This concept fundamentally challenges classical physics, which treats particles and waves as mutually exclusive. Instead, wave-particle duality highlights the complexity of quantum systems, where entities can embody and switch between these two forms of behavior depending on the experimental circumstances or the method of observation. This principle is essential for a comprehensive understanding of quantum mechanics and underpins many advanced theories and applications in the field.

10. Which of the following is NOT a fundamental principle of quantum mechanics?

A. Wave-particle duality

B. Uncertainty principle

C. Newton's laws of motion

D. Quantization of energy

Newton's laws of motion describe the behavior of macroscopic objects and are part of classical mechanics, rather than quantum mechanics. These laws encompass concepts such as inertia, force, and acceleration, which successfully explain the motion of larger-scale objects. However, they do not account for the peculiar behaviors that occur at the quantum level, such as the behavior of subatomic particles. In contrast, wave-particle duality illustrates that particles like electrons exhibit both wave-like and particle-like properties, which is foundational in quantum theory. The uncertainty principle articulates the inherent limits on how precisely we can know certain pairs of properties, such as position and momentum, at the same time. Lastly, the quantization of energy refers to the idea that energy exists in discrete packets or quanta, which is a cornerstone of quantum mechanics. All three concepts (wave-particle duality, uncertainty principle, and quantization of energy) are essential to understanding the quantum world, distinguishing them clearly from Newton's classical mechanics.

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://sqahigherphysics.examzify.com

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

SAMPLE