USAP SCIENCE PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://usapscience.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.

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. In aurora emission, which description correctly matches the sequence of events?

A. Ions capture electrons, emitting gamma rays

B. Solar wind creates ions, after that ions capture electrons, releasing light

C. Ions capture electrons, emitting X-rays

D. Ions capture electrons, then solar wind creates ions

2. The two types of opposite charges for magnetism are:

A. North and South

B. Positive and Negative

C. Up and Down

D. Alpha and Omega

3. Which term best describes the relationship between time and length in special relativity, as captured by the Lorentz transformations?

A. Time dilation and length contraction

B. Relativity of simultaneity

C. Spacetime interval

D. Lorentz factor

4. Which type of electrical current constantly changes direction, causing the magnetic field to change?

A. Direct current (DC)

B. Pulsating direct current (PDC)

C. Alternating current (AC)

D. Static current

5. Which current, in amperes, typically produces a painful shock?

A. 0.001 amps

B. 0.005 amps

C. 0.07 amps

D. 0.015 amps

SAMPLE

6. The speed of light in vacuum is determined by which two vacuum properties?

A. Charge and current

B. Permeability of free space and Permittivity of free space

C. Mass and charge

D. Frequency and wavelength

7. What is Newton's first law of motion?

A. The strength of a force is measured in Newtons.

B. Every action has an equivalent and opposite reaction.

C. An object's inertia will allow it to keep going as long as there are no external forces.

D. An object will accelerate in the direction of the force applied.

8. Which scenario best illustrates electric potential energy?

A. A positively charged pendulum suspended on a string over a negatively charged floor

B. A light bulb connected to a battery

C. A magnet sitting near a metal plate

D. An electron flowing through a conductor

9. The force of gravity is more sensitive to changes in distance or mass?

A. Mass

B. Both equally

C. Distance

D. Gravity not sensitive to either

10. Which statement best defines a generator?

A. Any device that converts mechanical motion into electrical energy

B. A device that stores electrical energy

C. A device that converts electrical energy into chemical energy

D. A device that converts electrical energy into mechanical energy

SAMPLE

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. In aurora emission, which description correctly matches the sequence of events?

A. Ions capture electrons, emitting gamma rays

B. Solar wind creates ions, after that ions capture electrons, releasing light

C. Ions capture electrons, emitting X-rays

D. Ions capture electrons, then solar wind creates ions

The event sequence tested here starts with energy from the Sun being carried into Earth's near-space environment by the solar wind, which creates ions in the upper atmosphere. Those ions then capture electrons (recombine), and as the resulting excited states settle back down, photons are emitted. This produces the observable light of the aurora. So the description that solar wind provides the energy to form ions, followed by those ions capturing electrons and releasing light, matches what we see: light in the visible range from atmospheric gases like oxygen and nitrogen as they relax after being energized. Gamma rays or X-rays would require much higher energies than typical auroral processes, so those alternatives don't fit the usual auroral emission.

2. The two types of opposite charges for magnetism are:

A. North and South

B. Positive and Negative

C. Up and Down

D. Alpha and Omega

Magnetism is described by two opposite poles: north and south. A magnet's field lines exit from the north pole and enter the south pole. Opposite poles attract, so a north pole pulls on a south pole, while like poles repel. This is why magnets attract magnetic materials and why compasses align with a magnetic field. It's also why magnets always come as a north-south pair—there aren't isolated magnetic poles.

3. Which term best describes the relationship between time and length in special relativity, as captured by the Lorentz transformations?

A. Time dilation and length contraction

B. Relativity of simultaneity

C. Spacetime interval

D. Lorentz factor

The main idea is that time and length are connected through the Lorentz transformations, which mix time and space coordinates when comparing moving inertial frames. The key quantity that governs how much time and length change between frames is the Lorentz factor, $\gamma = 1/\sqrt{(1 - v^2/c^2)}$. It appears directly in the transformation equations $t' = \gamma(t - v x / c^2)$ and $x' = \gamma(x - v t)$. Because γ scales both time and space coordinates depending on the relative velocity, it sets how much clocks tick slower (time dilation) and how lengths contract (length contraction) when viewed from a different frame. That shared multiplier is what ties time and length together in the Lorentz framework, making the Lorentz factor the best descriptor. The other terms describe specific effects or invariants, but they don't capture the single scaling relationship that interlinks time and length via the transformations.

SAMPLE

4. Which type of electrical current constantly changes direction, causing the magnetic field to change?

A. Direct current (DC)

B. Pulsating direct current (PDC)

C. Alternating current (AC)

D. Static current

The magnetic field around a conductor follows the current and its direction. Direct current flows in one direction, so the magnetic field is steady in direction (though its strength can change with load). Pulsating direct current also keeps the same direction, so the field changes in magnitude but not in direction. Static current means no change over time, so there's no changing magnetic field at all. Alternating current reverses direction repeatedly, so the magnetic field around the wire flips as well. That continuous reversal is what makes the magnetic field change direction over time. The rate of reversal is the frequency of the current, which is why AC power systems and devices rely on alternating current.

5. Which current, in amperes, typically produces a painful shock?

A. 0.001 amps

B. 0.005 amps

C. 0.07 amps

D. 0.015 amps

The important idea is how current level relates to what a person feels and how dangerous it can be. For alternating current at typical frequencies, the onset of a painful shock happens at only a few milliamps. About 5 milliamps, which is 0.005 amperes, is commonly cited as the threshold where the sensation becomes painful. Smaller currents, like 1 mA, are usually barely noticeable, while larger currents (tens of milliamps or more) can cause stronger contractions, loss of control, or more serious hazards. So 0.005 A best matches the commonly cited point at which a shock becomes painful.

6. The speed of light in vacuum is determined by which two vacuum properties?

A. Charge and current

B. Permeability of free space and Permittivity of free space

C. Mass and charge

D. Frequency and wavelength

The speed of light in vacuum is set by the electromagnetic properties of space itself. In Maxwell's framework, how electric and magnetic fields propagate through empty space is governed by the permittivity of free space (ε_0) and the permeability of free space (μ_0). The wave speed that results from these constants is $c = 1/\sqrt{(\varepsilon_0 \mu_0)}$. That means the universal speed is determined by space's ability to permit electric fields and to support magnetic fields, not by the light's source or by particle properties. In numbers, ε_0 is about 8.85×10^{-12} F/m and μ_0 is about $4\pi\times10^{-7}$ H/m, which combine to give $c \approx 3.00\times10^8$ m/s. It's also true that, in vacuum, all frequencies travel at this same speed, with $f\lambda = c$ linking frequency and wavelength. The other options don't set the propagation speed in vacuum: charge and current are sources, mass and charge are properties of particles, and frequency and wavelength describe the wave but don't determine the intrinsic speed in empty space.

SAMPLE

7. What is Newton's first law of motion?

A. The strength of a force is measured in Newtons.

B. Every action has an equivalent and opposite reaction.

C. An object's inertia will allow it to keep going as long as there are no external forces.

D. An object will accelerate in the direction of the force applied.

Inertia governs motion: objects resist changes to how they're moving, so without a net external force, an object will keep moving in a straight line at constant speed (or stay at rest). That's the essence of Newton's first law. The best choice conveys this idea: an object's inertia causes it to keep moving as long as there are no external forces acting on it. That captures both staying at rest and continuing in straight, unaccelerated motion when no net force is present. The other statements point to different ideas: one mentions the unit of force (a separate concept), another is Newton's third law about action-reaction pairs, and another describes acceleration proportional to force (Newton's second law).

8. Which scenario best illustrates electric potential energy?

A. A positively charged pendulum suspended on a string over a negatively charged floor

B. A light bulb connected to a battery

C. A magnet sitting near a metal plate

D. An electron flowing through a conductor

Electric potential energy is energy stored because of a system's configuration in an electric field, specifically due to the positions of charges relative to one another. When opposite charges are brought near each other, the electric field stores energy that depends on how far apart they are. In this scenario, a positively charged pendulum sits near a negatively charged floor. The opposite charges attract, so the pendulum is placed in a position where the electric field is actively storing energy. If the pendulum moves closer, the energy changes—generally becoming more negative—while moving away increases the stored energy again. This dependence on position means the system contains electric potential energy that can be converted to kinetic energy as the pendulum swings. The other situations involve energy being used or transferred (a light bulb drawing energy from a battery) or involve magnetic effects or current flow, which aren't about storing energy in the electric field due to the relative positions of charges.

9. The force of gravity is more sensitive to changes in distance or mass?

A. Mass

B. Both equally

C. Distance

D. Gravity not sensitive to either

Gravitational force depends on distance as an inverse square, F 1/r^2, and on each mass linearly, F m1 m2. That means small changes in distance produce larger relative changes in the force than the same small changes in mass. For tiny changes, the fractional change in force from distance is about twice the fractional change in distance itself: dF/F ≈ -2(dr/r). In contrast, the fractional change from changing mass is simply dF/F ≈ dm/m. So distance has a stronger effect on gravity than mass. Concrete intuition helps: doubling the distance makes gravity drop to one quarter (a 75% decrease), while doubling a mass only doubles the gravitational pull (a 100% increase). Halving the distance multiplies gravity by four, whereas halving the mass halves gravity. Therefore, gravity is more sensitive to changes in distance than to changes in mass.

SAMPLE

10. Which statement best defines a generator?

A. Any device that converts mechanical motion into electrical energy

B. A device that stores electrical energy

C. A device that converts electrical energy into chemical energy

D. A device that converts electrical energy into mechanical energy

A generator takes motion and turns it into electricity. When a conductor moves in a magnetic field, or the magnetic field around a conductor changes, electrical energy is induced. This is how a turbine, crank, or other source of mechanical energy becomes electrical energy that can power lights and devices. It's different from storing energy (like a battery stores chemical energy) or converting electricity into another form like chemical energy (charging a battery) or mechanical energy (an electric motor). So the statement that describes converting mechanical energy into electrical energy is the one that fits a generator.

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://usapscience.examzify.com

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

SAMPLE