A LEVEL PHYSICS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. Which particle is known to have a negative charge?

A. Proton

B. Neutron

C. Electron

D. Positron

2. How can the energy of a photon be expressed in terms of its wavelength?

A. E = mc^2

B. E = hf

C. E = h / wavelength

D. E = mc^3

3. In the context of reading a spectrometer, what important assumption should be verified?

A. There is a consistent temperature throughout the process

B. No zero error should be present

C. All measurements should be made in the same unit

D. No external light interfere with the readings

4. According to the principle of moments, when is a system in equilibrium?

A. The sum of the clockwise moments equals total weight

B. The sum of the clockwise moments equals the sum of the anti-clockwise moments

C. The total force equals zero

D. The applied forces are balanced by the support forces

5. When the angle of diffraction θ reaches about 50°, what order of spectrum is observed?

A. Second order spectrum

B. First order beam

C. Third order spectrum

D. Zero order spectrum

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6. What is the term used to describe each type of nucleus?

A. Nucleus type

B. Atom type

C. Isotope

D. Nuclide

7. Which term describes the frequency of a wave if it completes 4 oscillations in 2 seconds?

A. 2 Hz

B. 4 Hz

C. 8 Hz

D. 16 Hz

8. What is the speed vs. time graph for a parachutist during a jump expected to show initially?

A. A constant speed

B. A decreasing speed

C. An increasing speed

D. A rapid drop to terminal velocity

9. According to the given scenario, how much does the lorry compress the spring?

A. 0.010m

B. 0.030m

C. 0.050m

D. 0.100m

10. How is the intensity of light defined?

A. The amount of light produced

B. The energy of each photon

C. The number of photons striking a surface per second

D. The wavelength of light

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Answers

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

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Explanations

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1. Which particle is known to have a negative charge?

A. Proton

B. Neutron

C. Electron

D. Positron

The electron is recognized as a fundamental particle with a negative charge. In atomic structure, electrons orbit the nucleus, which is composed of protons and neutrons. The electron's negative charge is essential for the formation of chemical bonds and the overall stability of atoms, as it interacts with the positively charged protons found in the nucleus. Protons have a positive charge, which contrasts with that of electrons and enables electrostatic attraction between them. Neutrons, on the other hand, are neutral particles with no charge, playing a critical role in stabilizing the nucleus alongside protons. A positron, while having the same mass as an electron, carries a positive charge and is considered the electron's antiparticle. Thus, the designation of the electron as the particle with a negative charge is crucial in understanding the behavior of matter at the atomic level and the interactions between subatomic particles.

2. How can the energy of a photon be expressed in terms of its wavelength?

A. E = mc^2

B. E = hf

C. E = h / wavelength

D. E = mc^3

The energy of a photon can be expressed in terms of its wavelength using the equation derived from the relationship between energy, frequency, and wavelength. The correct expression for the energy of a photon is given by the equation E = hf, where E represents the energy, h is Planck's constant, and f is the frequency of the photon. To connect frequency to wavelength, one can use the wave equation, which states that the speed of light (c) is equal to the product of its frequency (f) and wavelength (λ): c = fλ. By rearranging this equation, we can express frequency as f = c / λ. Substituting this back into the equation for energy gives us E = h(c / λ), which can also be written as E = hc / λ. Thus, energy is inversely proportional to the wavelength. This explains why the expression for energy in terms of wavelength is derived and how it fundamentally relates to other properties of light, allowing us to understand that shorter wavelengths correspond to higher energy photons.

3. In the context of reading a spectrometer, what important assumption should be verified?

A. There is a consistent temperature throughout the process

B. No zero error should be present

C. All measurements should be made in the same unit

D. No external light interfere with the readings

In the context of reading a spectrometer, ensuring that no zero error is present is crucial because zero error can significantly affect the accuracy of the measurements taken. A zero error occurs when the instrument does not read zero when it should, leading to consistent offsets in all readings. This means that every measurement will be incorrect by the same amount; thus, the relationship between the observed and actual values will be distorted. When beginning to use any measuring instrument like a spectrometer, it is standard practice to check that it reads zero at the baseline. If a zero error exists, it must be accounted for and corrected to ensure that subsequent measurements reflect the true values being assessed. This correction is fundamental for accurate data interpretation and analysis in experiments involving light and measurements of wavelengths. The other considerations mentioned, such as consistent temperature, unit uniformity, and prevention of external light interference, while important in their own right, do not directly address the immediate accuracy of the instrument's readings as effectively as ensuring the zero error is resolved.

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4. According to the principle of moments, when is a system in equilibrium?

A. The sum of the clockwise moments equals total weight

B. The sum of the clockwise moments equals the sum of the anti-clockwise moments

C. The total force equals zero

D. The applied forces are balanced by the support forces

A system is in equilibrium according to the principle of moments when the sum of the clockwise moments equals the sum of the anti-clockwise moments. This principle is derived from the observation that for an object to be in rotational equilibrium, there must be no net moment acting on it. In practical terms, this means that if you take any pivot point, the moments caused by forces acting in a clockwise direction must be balanced by those acting in an anti-clockwise direction. When this balance is achieved, the object will neither rotate about the pivot point nor change its state of motion. While the total force being zero is also a condition for translational equilibrium, it does not specifically address the rotational aspects governed by the principle of moments. The statement about total weight relates to the overall force balance rather than rotational moments. Similarly, the notion of applied forces being balanced by support forces does not encapsulate the rotational characteristics required for a system to be in equilibrium as defined by the principle of moments.

5. When the angle of diffraction θ reaches about 50°, what order of spectrum is observed?

A. Second order spectrum

B. First order beam

C. Third order spectrum

D. Zero order spectrum

To determine the order of spectrum associated with a diffraction angle of about 50°, it is essential to understand how diffraction patterns are formed, particularly through the use of a grating equation. The grating equation is given by: \[d \sin \theta = n \lambda \] where: - \(d \) is the distance between the grating lines (grating spacing), - \(\theta \) is the angle of diffraction, - \(n \) is the order of the spectrum, and - \(\lambda \) is the wavelength of the light being diffracted. As the angle of diffraction increases, higher-order spectra can be observed. The first-order spectrum (where n=1) occurs when the path difference between adjacent waves is equal to one wavelength. This corresponds to a relatively small angle. For larger angles, such as 50°, we typically check the next integral values of n to see what can physically align under the given diffraction circumstances. At an angle of 50°, while it is indeed a significant angle, it is plausible for light to be diffracted in the first order particularly when the wavelength and grating spacing correspond well. The first-order spectrum would be expected to still be quite pronounced when \(

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6. What is the term used to describe each type of nucleus?

A. Nucleus type

B. Atom type

C. Isotope

D. Nuclide

The term used to describe each type of nucleus is "nuclide." A nuclide is defined as a distinct species of atom characterized by its number of protons (which determines the atomic number) and its number of neutrons (which along with protons makes up the atomic mass). This designation includes stable and unstable isotopes. Understanding the concept of nuclides is critical in nuclear physics and chemistry, as it provides a way to categorize all the possible nuclear species based on their unique combinations of protons and neutrons. By precisely identifying nuclides, scientists can analyze radioactivity, nuclear decay, and various types of nuclear reactions. In contrast, while "isotope" refers specifically to variants of a particular element that have the same number of protons but different numbers of neutrons, it does not encompass all possible variations of atomic nuclei. Therefore, although related, "isotope" is a narrower term than "nuclide." The terms "nucleus type" and "atom type" are not standard terminology in nuclear science to classify different nuclei. Thus, "nuclide" is the most accurate term for describing each type of nucleus.

7. Which term describes the frequency of a wave if it completes 4 oscillations in 2 seconds?

A. 2 Hz

B. 4 Hz

C. 8 Hz

D. 16 Hz

To determine the frequency of a wave, you need to consider how many oscillations (or cycles) occur in a given time period. Frequency is defined as the number of oscillations per second and is measured in hertz (Hz). In this case, the wave completes 4 oscillations in 2 seconds. To find the frequency, you divide the number of oscillations by the time it takes for those oscillations to occur: Frequency = Number of Oscillations / Time (in seconds) Plugging in the given values: Frequency = 4 oscillations / 2 seconds = 2 Hz This indicates that the wave oscillates twice every second. Therefore, the correct term describing the frequency of this wave is indeed 2 Hz.

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8. What is the speed vs. time graph for a parachutist during a jump expected to show initially?

A. A constant speed

B. A decreasing speed

C. An increasing speed

D. A rapid drop to terminal velocity

In the context of a parachutist's jump, initially, the speed versus time graph is expected to show a rapid increase in speed as the parachutist accelerates due to gravity. Initially, when the parachutist jumps from the plane, they experience a free fall, which means gravity is the dominant force acting on them, resulting in an increase in speed. As they continue to fall, the drag force from the air becomes significant. Initially, the drag force is not sufficient to counteract the gravitational force, so the parachutist continues to accelerate downward. As the speed increases, the drag force increases as well, eventually leading to a point where the two forces balance each other out—this is known as terminal velocity. The rapid increase in speed will continue until this balance is reached, resulting in a graph that shows a steep increase in speed at first. This behavior is characteristic of free fall until terminal velocity is approached, reflecting the rapid drop to terminal velocity in the initial phase of the jump. The parachutist will not maintain constant speed or decrease speed at the very beginning of the jump.

9. According to the given scenario, how much does the lorry compress the spring?

A. 0.010m

B. 0.030m

C. 0.050m

D. 0.100m

To determine how much the lorry compresses the spring, one typically considers the weight of the lorry and the properties of the spring itself, particularly its spring constant. When a load, such as a lorry, is placed on the spring, the force due to the weight of the lorry causes the spring to compress according to Hooke's Law, which states that the force exerted by a spring is directly proportional to its displacement from the equilibrium position. The equation can be expressed as: $F = kx$ where F is the force applied (the weight of the lorry), k is the spring constant, and x is the displacement, which in this case is the amount by which the spring is compressed. If the answer indicates that the compression is 0.030 m, it suggests that upon analyzing the forces in equilibrium, where the gravitational force acting on the lorry equals the restoring force of the spring, the calculations using the spring constant and weight yield this specific value. This means that for the given scenario, the weight of the lorry and the resulting force exerted on the spring have been computed correctly, yielding a compression of 0.030 m that adheres to the principles of mechanics and the properties of springs

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10. How is the intensity of light defined?

A. The amount of light produced

B. The energy of each photon

C. The number of photons striking a surface per second

D. The wavelength of light

The intensity of light is defined as the number of photons striking a surface per second, which corresponds directly to the amount of energy transmitted by that light over a certain area. Intensity takes into account both the energy of the individual photons and how many of them are arriving at a surface, making it a measure of the power per unit area. This definition is rooted in the principle that light can be thought of as both a wave and a stream of particles (photons). The higher the number of photons per second impacting a surface, the greater the energy delivered to that surface, leading to a higher intensity of light. In contrast, the other options do not accurately reflect the concept of intensity. The amount of light produced refers to brightness in a general sense without quantifying it in terms of energy or area. The energy of each photon pertains to the frequency and wavelength of the light, which contributes to its color, but does not define intensity alone. The wavelength of light is a characteristic of the light itself and does not provide information regarding the intensity, which is fundamentally about the photon count and energy flux.

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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://alevelphysics.examzify.com

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

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