NEET Physics Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

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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.

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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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

1. What is the value of ε_0 in SI units ($C^2/(N \cdot m^2)$)?

A. $\varepsilon_0 = 8.85 \times 10^{-12}$

B. $\varepsilon_0 = 9.11 \times 10^{-31}$

C. $\varepsilon_0 = 4.50 \times 10^{-9}$

D. $\varepsilon_0 = 1.00 \times 10^{-6}$

2. Which equation represents the maximum intensity in interference?

A. $I\ max = (\sqrt{I_1} + \sqrt{I_2})^2$

B. $I\ max = (\sqrt{I_1} - \sqrt{I_2})^2$

C. $I\ max = I_1 + I_2$

D. $I\ max = I_2 - I_1$

3. What is the formula for the intensity ratio in interference?

A. $x = I_1 / I_2$

B. $x = I_2 / I_1$

C. $x = I_1 + I_2$

D. $x = I_1 - I_2$

4. What provides the maximum amplitude of oscillation in resonance?

A. The mass of the oscillating object

B. The damping factor of the system

C. The match of external force frequency with natural frequency

D. The temperature of the environment

5. What does the principle of conservation of momentum state?

A. Total momentum remains constant in a closed system.

B. Momentum can be created in a closed system.

C. Momentum loss is always offset by an equivalent gain.

D. External forces increase momentum in all cases.

6. In the context of Ohm's law, what is represented by the letter "R"?

A. Voltage across the conductor.

B. Measured current through the conductor.

C. Resistance of the conductor.

D. Power within the circuit.

7. What is the diffraction condition for destructive interference?

A. $d \sin(\theta) = n\lambda$

B. $d \sin(\theta) = (m + 1/2)\lambda$

C. $a \sin(\theta) = m\lambda$

D. λ = μwater / λair

8. What unit is used to measure optical power?

A. Focal length

B. Lens strength

C. Diopters

D. Magnification

9. Which experimental evidence supports the wave nature of electrons?

A. Hubble's Experiment

B. Davisson and Germer Experiment

C. Millikan's Oil Drop Experiment

D. Thomson's Cathode Ray Experiment

10. What is the length of 1 angstrom (Å) in meters?

A. 10^{-3} m

B. 10^{-9} m

C. 10^{-10} m

D. 10^{-14} m

Answers

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

Explanations

1. What is the value of ε_0 in SI units ($C^2/(N\cdot m^2)$)?

A. $\varepsilon_0 = 8.85 \times 10^{-12}$

B. $\varepsilon_0 = 9.11 \times 10^{-31}$

C. $\varepsilon_0 = 4.50 \times 10^{-9}$

D. $\varepsilon_0 = 1.00 \times 10^{-6}$

The value of ε_0, known as the permittivity of free space, is a fundamental physical constant that measures the ability of a vacuum to permit electric field lines. In SI units, it is expressed as $C^2/(N\cdot m^2)$, meaning it relates the electric charge (C), force (N), and distance (m). The accepted and widely referenced value of permittivity in free space is approximately 8.85×10^{-12} $C^2/(N\cdot m^2)$. This constant is essential in equations that describe electrostatic forces, such as Coulomb's law, and plays a critical role in the formulation of Maxwell's equations, which govern electromagnetism. The magnitude of ε_0 is derived from various physical laws and measurements, and it reflects how electric fields behave in a vacuum. Understanding this value is crucial for solving problems related to capacitance, electric field strength, and potential difference in circuits. The other values provided in the options correspond to different physical constants or units entirely unrelated to the permittivity of free space. For example, one option resembles the mass of an electron, while others do not conform to common known constants in electrostatics. Therefore, the accurate and relevant choice for

2. Which equation represents the maximum intensity in interference?

A. $I_{max} = (\sqrt{I_1} + \sqrt{I_2})^2$

B. $I_{max} = (\sqrt{I_1} - \sqrt{I_2})^2$

C. $I_{max} = I_1 + I_2$

D. $I_{max} = I_2 - I_1$

The equation that represents the maximum intensity in interference is derived from the principle of superposition of waves. In the case of two coherent sources of waves, the total intensity at a point results from the interference of those waves. The formula $I_{max} = (\sqrt{I_1} + \sqrt{I_2})^2$ gives the maximum intensity when both waves constructively interfere. Here, I_1 and I_2 represent the intensities of the two waves before interference occurs. When the waves are in phase, their amplitudes can be added directly, leading to the maximum amplitude of the resultant wave being the sum of the amplitudes of the individual waves. To translate the amplitudes back to intensity, which is proportional to the square of the amplitude, we square the sum of the square roots of the individual intensities. Hence, this equation effectively captures the scenario where the intensity is maximized due to constructive interference, allowing for the contribution of both sources to fully build upon one another. This reasoning highlights why this equation is appropriate for expressing maximum intensity in interference phenomena, while the other choices either depict scenarios of destructive interference or do not account for the necessary conditions needed to achieve maximum intensity.

3. What is the formula for the intensity ratio in interference?

A. $x = I_1 / I_2$

B. $x = I_2 / I_1$

C. $x = I_1 + I_2$

D. $x = I_1 - I_2$

In the context of interference phenomena, particularly in wave physics, the intensity ratio is a measure of how the intensities of two interfering waves compare. The correct formula for this intensity ratio is expressed as the ratio of the intensity of one wave to the intensity of the other, which is represented by I_1 and I_2. When considering two coherent waves interfering with each other, the interference pattern formed depends on their individual intensities. The standard definition of the intensity ratio, represented as x, is indeed given by the ratio of I_1 to I_2. This means that if you know the intensity of either wave, you can easily compute how much stronger one wave is compared to the other. In contrast, options that involve addition or subtraction (like $I_1 + I_2$ or $I_1 - I_2$) do not provide a ratio; rather, they would represent combined intensities or the resultant intensity in a different context. Therefore, the formula mentioned in the first choice accurately describes the fundamental relationship between the two intensities in an interference pattern.

4. What provides the maximum amplitude of oscillation in resonance?

A. The mass of the oscillating object

B. The damping factor of the system

C. The match of external force frequency with natural frequency

D. The temperature of the environment

Resonance occurs when an external force is applied to a system at a frequency that matches the system's natural frequency. When this happens, energy is transferred efficiently into the system, resulting in a significant increase in the amplitude of oscillation. This phenomenon is critical in various applications, from musical instruments to engineering structures. When the external force frequency matches the natural frequency, the oscillating system can absorb energy over time, leading to maximum amplitude. If there is a mismatch between the frequencies, the oscillation will not reach the same amplitude, as energy transfer will be less effective. While factors such as the mass of the oscillating object and the damping factor can influence the overall behavior of the system, they do not specifically provide the maximum amplitude of oscillation during resonance. The damping factor, for instance, deals with energy loss due to friction or air resistance, which can decrease the amplitude instead of enhancing it. Environmental temperature may affect the material properties, yet it does not play a direct role in achieving resonance and thus maximum amplitude. In summary, the match of the external force frequency with the natural frequency is the critical aspect that leads to achieving maximum amplitude during resonance, making it the correct answer.

5. What does the principle of conservation of momentum state?

A. Total momentum remains constant in a closed system.

B. Momentum can be created in a closed system.

C. Momentum loss is always offset by an equivalent gain.

D. External forces increase momentum in all cases.

The principle of conservation of momentum states that in a closed system, where no external forces are acting, the total momentum of the system remains constant over time. This means that the momentum before an interaction (such as a collision) is equal to the momentum after the interaction, assuming that the system is isolated from external influences. For instance, if two objects collide, the total momentum calculated from both objects before the collision will be equal to the total momentum after the collision, as long as no other forces have interfered during the interaction. This principle is fundamental in analyzing various physical situations, including collisions and explosions. In contrast to this principle, options suggesting that momentum can be created or that external forces always increase momentum do not align with the established scientific understanding of momentum in isolated systems. Additionally, the idea that momentum loss can be offset by an equivalent gain does not accurately represent how momentum functions under the principle of conservation, where the total must be maintained rather than translated through losses and gains.

6. In the context of Ohm's law, what is represented by the letter "R"?

A. Voltage across the conductor.

B. Measured current through the conductor.

C. Resistance of the conductor.

D. Power within the circuit.

In the context of Ohm's law, the letter "R" represents the resistance of the conductor. Ohm's law is typically stated as $V = I \cdot R$, where V is the voltage across the conductor, I is the current flowing through it, and R is the resistance. Resistance reflects how much the conductor opposes the flow of electric current. A higher resistance means that for a given voltage, less current will flow through the conductor, whereas a lower resistance allows more current to pass. Understanding resistance is crucial because it helps in analyzing how circuits function under different voltage and current conditions. The other concepts mentioned, such as voltage and current, are related to the functionality of the circuit but do not accurately represent what "R" signifies in Ohm's law. Resistance is intrinsic to the material and shape of the conductor, determining its effectiveness in conducting electric flow.

7. What is the diffraction condition for destructive interference?

A. d sin(θ) = nλ

<u>B. d sin(θ) = (m + 1/2)λ</u>

C. a sin(θ) = mλ

D. λ = μwater / λair

The diffraction condition for destructive interference occurs when waves interact in such a way that they cancel each other out. For a system of waves, this happens at specific angles and distances, which can be described mathematically. The correct condition for destructive interference is when the path difference between the waves is an odd multiple of half the wavelength. Mathematically, this is represented as d sin(θ) = (m + 1/2)λ, where d is the distance between slits (or the width of the aperture in single-slit diffraction), θ is the angle of diffraction, λ is the wavelength of the incoming wave, and m is an integer (0, 1, 2,...). This means the waves arrive at the observation point out of phase, causing them to interfere destructively. This condition reflects situations like single and double slit diffraction, where specific angles result in positions where there is a minimum light intensity due to the cancellation of wave crests and troughs. When contrasting this with other options, the relations provided for choices involving "nλ" or "mλ" pertain to constructive interference or different physical principles and thus don't specify the destructive interference condition. The relationship in the last option discussing the wavelength in different media

8. What unit is used to measure optical power?

A. Focal length

B. Lens strength

<u>C. Diopters</u>

D. Magnification

Optical power is measured in diopters, which is the standard unit used when discussing the focusing ability of lenses. The relationship between optical power and focal length is defined by the formula: \[P = \frac{1}{f} \] where \(P \) is the power in diopters and \(f \) is the focal length in meters. This means that if a lens has a short focal length, it has a higher optical power, while a longer focal length corresponds to lower optical power. By using diopters, it allows for a clear and standardized way to quantify the strength of a lens, making it easier to compare different lenses and their ability to focus light. Other terms such as lens strength and magnification are related to optical systems but do not serve as direct units of measurement for optical power. Lens strength can refer to the general ability of a lens but is not standardized, and magnification refers to the size increase of an image created by the optical system without measuring the lens's power to converge or diverge light. Therefore, diopters is the correct and most proper unit for measuring optical power.

9. Which experimental evidence supports the wave nature of electrons?

- A. Hubble's Experiment
- B. Davisson and Germer Experiment
- C. Millikan's Oil Drop Experiment
- D. Thomson's Cathode Ray Experiment

The experimental evidence that supports the wave nature of electrons is found in the Davisson and Germer experiment. This landmark experiment conducted in 1927 demonstrated that electrons can exhibit wave-like behavior when they are diffracted. In this experiment, a beam of electrons was directed at a nickel crystal. As the electrons interacted with the crystal, they produced a diffraction pattern similar to that observed with light waves. This diffraction pattern is a hallmark of wave behavior. The resulting data not only confirmed Louis de Broglie's hypothesis that particles such as electrons exhibit both wave and particle characteristics but also provided strong empirical support for the theory of wave-particle duality. The wave nature of electrons is crucial to understanding various principles in quantum mechanics, including phenomena such as electron microscopy and the behavior of particles at the atomic and subatomic levels. In contrast, the other options do not demonstrate the wave nature of electrons: - Hubble's Experiment is related to cosmology and the expansion of the universe. - Millikan's Oil Drop Experiment measured the charge of the electron and did not address its wave properties. - Thomson's Cathode Ray Experiment was instrumental in discovering the electron itself but focused on its charge and mass rather than its wave characteristics.

10. What is the length of 1 angstrom (Å) in meters?

- A. 10^{-3} m
- B. 10^{-9} m
- C. 10^{-10} m
- D. 10^{-14} m

1 angstrom (Å) is defined as 10^{-10} meters. This unit of measure is commonly used in fields such as chemistry and physics, particularly when dealing with atomic and molecular scales. The angstrom is particularly useful for expressing atomic radii, bond lengths, and wavelengths in the electromagnetic spectrum, where these values are typically very small. Understanding the magnitude of an angstrom is key to interpreting measurements in scientific contexts. For example, the size of an atom is often around one angstrom, making it a convenient unit for such contexts. Therefore, the statement that 1 angstrom equals 10^{-10} m accurately captures the relationship between angstroms and meters, which is fundamental in understanding measurements at the atomic scale.

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://neetphysics.examzify.com

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