PRAXIS STUDY COMPANION – PHYSICS (5266) PRACTICE TEST (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 statement about the Doppler effect is true?

A. It applies only to sound waves

B. It applies to all waves and depends on the relative motion between source and observer

C. It does not depend on motion

D. It increases wavelength regardless of motion

2. Electric potential energy of two equal charges q separated by r is U = k q^2 / r. If q = 1 μC and r = 0.5 m, compute U.

A. 0.0036 J

B. 0.09 J

C. 0.0018 J

D. 0.018 J

3. A mass-spring system with mass 2 kg and spring constant 200 N/m has what approximate period?

A. 0.320 s

B. 0.628 s

C. 1.26 s

D. 2.51 s

4. Ampere's Law relates the line integral of the magnetic field around a closed loop to what quantity?

A. The line integral around a closed loop equals μ0 times the current enclosed

B. The curl of E equals zero in steady state

C. The energy stored in a magnetic field equals LI^2

D. The speed of light equals frequency times wavelength

5. Which quantity is not a vector (i.e., is scalar)?

A. Electric potential

B. Electric field

C. Velocity

D. Displacement

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6. Which expression gives current in terms of voltage and resistance?

A. I = V * R

B. I = V / R

C. I = R / V

D. I = V - R

7. Two equal masses m = 1 kg each on a frictionless track collide elastically head-on with equal and opposite speeds of 3 m/s. What are their speeds after the collision?

A. They exchange velocities; each moves at 3 m/s in opposite direction

B. One stops and the other goes 3 m/s

C. Both move forward at 3 m/s

D. They pass through without changing speeds

8. What is the magnitude of the magnetic force on a moving charge given by?

A. F = q E

B. F = μ0 I^2 L / (2π r)

C. F = B I L

D. F = q v B sin theta

9. Angular momentum L = m v r depends on which three quantities?

A. Mass, velocity, and time

B. Mass, velocity, and radius

C. Velocity, radius, and force

D. Mass, acceleration, and radius

10. Isotopes are

A. Atoms with different numbers of protons

B. Atoms of the same element with different numbers of neutrons

C. Atoms with different numbers of electrons

D. Atoms of different elements

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Answers

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

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Explanations

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1. Which statement about the Doppler effect is true?

A. It applies only to sound waves

B. It applies to all waves and depends on the relative motion between source and observer

C. It does not depend on motion

D. It increases wavelength regardless of motion

The Doppler effect shows how the observed frequency (and thus wavelength) changes because the source and observer are moving relative to each other. When the source and observer move toward each other, the observer encounters wave crests more frequently, so the observed frequency increases and the wavelength appears shorter. When they move apart, crests arrive less often, so the observed frequency decreases and the wavelength lengthens. This phenomenon is true for all waves, not just sound, though the exact math can differ for light due to relativity. So the best statement captures both the universality of the effect and its dependence on relative motion.

2. Electric potential energy of two equal charges q separated by r is U = k q^2 / r. If q = 1 μC and r = 0.5 m, compute U.

A. 0.0036 J

B. 0.09 J

C. 0.0018 J

D. 0.018 J

Electric potential energy between two point charges is given by U = k q1 q2 / r. When the charges are equal, this simplifies to U = k q^2 / r. Use k ≈ 8.99 × 10^9 N·m^2/C^2, q = 1 μC = 1 × 10^-6 C, and r = 0.5 m. Compute: q^2 = (1 × 10^-6 C)^2 = 1 × 10^-12 C^2. Then U = (8.99 × 10^9) × (1 × 10^-12) / 0.5 = (8.99 × 10^-3) / 0.5 = 0.01798 J ≈ 0.018 J. So the energy is about 0.018 joules.

3. A mass-spring system with mass 2 kg and spring constant 200 N/m has what approximate period?

A. 0.320 s

B. 0.628 s

C. 1.26 s

D. 2.51 s

For a mass on a spring in simple harmonic motion, the period is T = 2π sqrt(m/k). With m = 2 kg and k = 200 N/m, m/k = 2/200 = 0.01, and sqrt(0.01) = 0.1. So T = 2π × 0.1 = 0.2π ≈ 0.628 s. The approximate period is about 0.63 seconds. This shows the period grows with mass and decreases with stiffer springs.

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4. Ampere's Law relates the line integral of the magnetic field around a closed loop to what quantity?

A. The line integral around a closed loop equals μ0 times the current enclosed

B. The curl of E equals zero in steady state

C. The energy stored in a magnetic field equals LI^2

D. The speed of light equals frequency times wavelength

Magnetic fields created by currents circulate around the wires, and Ampere's law links how much circulation you get around a closed path to the amount of current passing through the loop's interior. Specifically, for steady currents, the line integral of the magnetic field B around a closed loop equals μ0 times the current that threads the surface bounded by that loop. Here μ0 is the permeability of free space, a constant that sets the strength of the magnetic response. So the quantity the line integral measures is the current enclosed by the loop, scaled by μ0: $B \cdot dl = \mu_0 I_{enc}$. For context, the other statements don't describe this relationship: curl E = 0 describes the electric field in electrostatics, not the magnetic circulation around a loop; the energy expression and the wave relation involve different physics or conventions, not the line integral of B around a loop.

5. Which quantity is not a vector (i.e., is scalar)?

A. Electric potential

B. Electric field

C. Velocity

D. Displacement

Vectors have both size and direction, while scalars have only size. Electric potential fits the scalar idea: at each point it assigns a single number—the potential energy per unit charge—without any direction. In contrast, the electric field has a direction and a magnitude, describing the force a unit positive test charge would feel at that point. Velocity is how fast and in which direction an object moves, and displacement is the overall change in position with a direction. All of these are vector quantities, so they require both magnitude and direction to specify them. There's also a direct connection between potential and field: the electric field is the negative gradient of the potential, E = - V. That relationship shows how a scalar field (V) gives rise to a vector field (E).

6. Which expression gives current in terms of voltage and resistance?

A. I = V * R

B. I = V / R

C. I = R / V

D. I = V - R

*Current is set by Ohm's law: the current through a conductor equals the voltage driving the current divided by the resistance the current faces. In symbols, I = V / R. This makes sense because increasing the voltage pushes more charge through for the same opposition, while increasing resistance reduces the current for a given voltage. The units line up: volts divided by ohms gives amperes. The other forms don't fit. I = V * R would combine volts and ohms to give a quantity with the wrong units for current. I = R / V would yield ohms per volt, which does not equal current. I = V - R mixes quantities that aren't directly subtractable to produce current.*

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7. Two equal masses m = 1 kg each on a frictionless track collide elastically head-on with equal and opposite speeds of 3 m/s. What are their speeds after the collision?

A. They exchange velocities; each moves at 3 m/s in opposite direction

B. One stops and the other goes 3 m/s

C. Both move forward at 3 m/s

D. They pass through without changing speeds

In a one-dimensional elastic collision on a frictionless track, momentum and kinetic energy are conserved. With equal masses and equal but opposite initial speeds, the most straightforward way to satisfy both conservation laws is for the bodies to swap velocities. Here, one mass starts at +3 m/s and the other at -3 m/s. After the collision, momentum conservation gives v1' + v2' = 0, so the final velocities are opposite: v2' = -v1'. Kinetic energy conservation requires v1'^2 + v2'^2 = 18 (since each mass has initial kinetic energy 1/2 m v^2 = 9, totaling 18 for m = 1). Substituting v2' = -v1' gives 2 v1'^2 = 18, so v1' = ±3 m/s and v2' = 3 m/s. The physically consistent outcome is that they exchange velocities: one ends up with -3 m/s and the other with +3 m/s. Thus each ends with a speed of 3 m/s, but in opposite directions—the velocities have swapped.

8. What is the magnitude of the magnetic force on a moving charge given by?

A. F = q E

B. F = μ0 I^2 L / (2π r)

C. F = B I L

D. F = q v B sin theta

The magnetic force on a moving charge comes from the Lorentz force, F = q v × B. Its magnitude is F = q v B sin theta, where theta is the angle between the velocity v and the magnetic field B. This tells you that the force depends on the charge, how fast it's moving, the strength of the field, and how their directions relate. If v is perpendicular to B, sin theta = 1 and you get the largest force; if v is parallel to B, sin theta = 0 and the magnetic force vanishes. The direction is perpendicular to both v and B (use the right-hand rule for a positive charge, opposite for a negative charge). The other expressions refer to different situations: F = qE is the electric force from an electric field, not a magnetic effect. F = μ0 I^2 L /(2π r) isn't the standard result for the force on a single moving charge. F = B I L is the magnetic force on a current-carrying wire, given by F = I L × B, which involves many charges moving together, not a single moving charge.

9. Angular momentum L = m v r depends on which three quantities?

A. Mass, velocity, and time

B. Mass, velocity, and radius

C. Velocity, radius, and force

D. Mass, acceleration, and radius

Angular momentum for a point particle about a fixed origin comes from the cross product of position and momentum: L = r × p = m (r × v). The magnitude is L = m v r sin(phi), where phi is the angle between the position vector and the velocity. When the motion is perpendicular to the radius (a common case, like circular or tangential motion), sin(phi) equals 1, giving L = m v r. So the quantities that set the angular momentum are the mass, the speed, and the distance from the origin (the radius). Time, force, or acceleration aren't direct factors in the basic expression; they influence L only by changing v or r.

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10. Isotopes are

A. Atoms with different numbers of protons

B. Atoms of the same element with different numbers of neutrons

C. Atoms with different numbers of electrons

D. Atoms of different elements

Isotopes are atoms of the same element that differ in the number of neutrons in the nucleus. Since the number of protons is the same, they belong to the same element and have the same chemical behavior, but the different neutron count changes the mass and can affect stability. If you changed the number of protons, you'd have a different element, not an isotope. Altering the number of electrons would just change the atom's charge state, not its isotopic identity.

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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://praxis5266.examzify.com

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

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