Praxis Study Companion – Physics (5266) Practice Test (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. 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!

Questions

1. A lens forms an image with magnification -2 and is inverted. What is the orientation of the image?

A. Upright

B. Cannot be determined

C. Lateral inversion only

D. Inverted

2. Temperature is defined as what?

A. A measure of the average kinetic energy in a system

B. The energy transferred between objects that are at different temperatures

C. The total kinetic energy of all molecules in a system added together

D. The amount of energy required to raise the temperature of a 1 gram substance by 1 degree Celsius

3. Hydrogen atom energy: E_n = -13.6 eV / n^2. What is the energy of the electron in the n = 2 state? What is the ionization energy from the ground state?

A. -3.4 eV; 13.6 eV

B. -3.4 eV; 3.4 eV

C. -13.6 eV; 13.6 eV

D. -1.7 eV; 6.8 eV

4. 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

5. What does the work function represent in the photoelectric effect?

A. The energy needed to liberate an electron from the surface

B. The kinetic energy of the emitted electron

C. The energy of the incident photon

D. The energy stored in the nucleus

6. Nuclear fusion occurs when light nuclei are forced together to produce heavier nuclei. What byproduct is commonly formed?

A. A reaction that produces energy by splitting a heavy nucleus into lighter nuclei.

B. A reaction that occurs when light nuclei are forced together to produce heavier nuclei; hydrogen is the byproduct.

C. A reaction that occurs when light nuclei are forced together to produce heavier nuclei; helium is byproduct.

D. The emission of an electron from a nucleus during beta decay.

7. 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

8. Which term describes the energy stored due to molecular motion in a system?

A. Temperature

B. Heat

C. Specific heat

D. Thermal energy

9. The slope of the velocity-time graph in the given scenario equals which quantity?

A. -5 m/s^2

B. 5 m/s^2

C. 0 m/s^2

D. 10 m/s^2

10. 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

Answers

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

Explanations

1. A lens forms an image with magnification -2 and is inverted. What is the orientation of the image?

A. Upright

B. Cannot be determined

C. Lateral inversion only

D. Inverted

The orientation is inverted. Magnification with a negative sign means the image is flipped relative to the object. Here the magnitude is 2, so the image is twice as tall, but the key point is the negative sign indicating inversion. In a simple lens forming a real image, this flip occurs (top becomes bottom, and left/right can also swap), so the image is inverted rather than upright.

2. Temperature is defined as what?

A. A measure of the average kinetic energy in a system

B. The energy transferred between objects that are at different temperatures

C. The total kinetic energy of all molecules in a system added together

D. The amount of energy required to raise the temperature of a 1 gram substance by 1 degree Celsius

Temperature is a measure of how vigorously the particles in a substance are moving on average. It reflects the average kinetic energy of those particles: higher average motion means a higher temperature. This is why two objects at the same temperature can have different amounts of energy if they contain different amounts of matter—the total kinetic energy depends on both how fast the particles are moving on average and how many particles there are. The energy transferred between objects at different temperatures is heat, not temperature itself. The energy needed to raise a substance's temperature by 1 degree Celsius is a property related to heat capacity (specific heat), not the definition of temperature.

3. Hydrogen atom energy: E_n = -13.6 eV / n^2. What is the energy of the electron in the n = 2 state? What is the ionization energy from the ground state?

A. -3.4 eV; 13.6 eV

B. -3.4 eV; 3.4 eV

C. -13.6 eV; 13.6 eV

D. -1.7 eV; 6.8 eV

In hydrogen, bound-state energies are negative and follow E_n = -13.6 eV / n^2. For the state with n = 2, E_2 = -13.6 eV / 4 = -3.4 eV, so the electron in that level has energy -3.4 eV. The ionization energy from the ground state is the energy required to remove the electron completely, i.e., raise the energy from E_1 = -13.6 eV to 0. The needed amount is 0 - (-13.6) = 13.6 eV. So the energy of the electron in the n = 2 state is -3.4 eV, and the ionization energy from the ground state is 13.6 eV.

4. 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.

5. What does the work function represent in the photoelectric effect?

A. The energy needed to liberate an electron from the surface

B. The kinetic energy of the emitted electron

C. The energy of the incident photon

D. The energy stored in the nucleus

The work function is the energy required to remove an electron from a material's surface and place it into vacuum. Imagine the surface as a barrier; you must supply at least that amount of energy to let the electron escape. In the photoelectric effect, the incoming photon provides energy h f; at least φ, the work function, must be used to overcome the surface binding, and any leftover energy becomes the electron's kinetic energy. So the maximum kinetic energy of the emitted electron is h f minus φ, and if h f is less than φ, no emission occurs. This concept is about binding to the surface, not about the photon's energy itself or any nuclear energy. The work function depends on the material and surface condition.

6. Nuclear fusion occurs when light nuclei are forced together to produce heavier nuclei. What byproduct is commonly formed?

A. A reaction that produces energy by splitting a heavy nucleus into lighter nuclei.

B. A reaction that occurs when light nuclei are forced together to produce heavier nuclei; hydrogen is the byproduct.

C. A reaction that occurs when light nuclei are forced together to produce heavier nuclei; helium is byproduct.

D. The emission of an electron from a nucleus during beta decay.

When light nuclei fuse, they form a heavier nucleus with a higher binding energy per nucleon, releasing energy in the process. The most common heavier product from such fusion is a helium nucleus (helium-4). For example, deuterium and tritium fusion produces helium-4 along with a neutron and energy. Hydrogen itself isn't the byproduct because the reactants are light hydrogen isotopes that combine to make helium. This fusion scenario is different from fission, which splits a heavy nucleus, and from beta decay, which emits an electron. So helium is the commonly formed byproduct.

7. 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.

8. Which term describes the energy stored due to molecular motion in a system?

A. Temperature

B. Heat

C. Specific heat

D. Thermal energy

Thermal energy is the energy in a system that comes from the random motion and interactions of its molecules. It represents the internal energy tied to temperature, including both the kinetic energy of moving particles and the potential energy from their interactions. Temperature is a measure of the average kinetic energy, not the total energy stored. Heat is energy in transit due to a temperature difference, not the stored energy itself. Specific heat tells you how much energy is needed to raise the temperature of a given mass. So, the energy stored because of molecular motion in a system is thermal energy.

9. The slope of the velocity-time graph in the given scenario equals which quantity?

A. -5 m/s^2

B. 5 m/s^2

C. 0 m/s^2

D. 10 m/s^2

The slope of a velocity-time graph is the acceleration, since acceleration is how velocity changes per unit time. If velocity increases by 5 m/s each second, the slope is Δv/Δt = 5 m/s ÷ 1 s = 5 m/s^2. The positive slope means velocity is increasing over time. So the acceleration here is 5 m/s^2. This also clarifies why other possibilities don't fit: a zero slope would mean no change in velocity, a negative slope would indicate deceleration, and a value like 10 m/s^2 would require the velocity to change twice as fast in the same time interval.

10. 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.

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!