HIGH SCHOOL PHYSICS PRACTICE TEST (SAMPLE)

STUDY GUIDE

SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Table of Contents

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. **Which term describes the path followed by a projectile near Earth's surface?**

   A. Free Fall

   B. Range

   C. Projectile Motion

   D. Contact Force

2. **A data pair (x, y) follows y = m x + b. If x represents time and y represents position, what does the slope m represent in a physical context of motion?**

   A. The intercept b

   B. The acceleration

   C. The velocity at x = 0

   D. The rate of change; e.g., velocity if y is position and x is time

3. **A 0.5 kg ball collides inelastically with a 0.5 kg ball at rest; after the collision they move together with velocity v. If the first ball's initial velocity is u, what is the final velocity?**

   A. v_final = u.

   B. v_final = 2u.

   C. v_final = 0.

   D. v_final = 0.5u.

4. **Which statement about collisions is true?**

   A. Kinetic energy is always conserved in all collisions.

   B. Momentum is conserved in every collision.

   C. Total energy is conserved in all collisions, but kinetic energy may not be.

   D. Energy can be created or destroyed in collisions.

5. **A concave mirror has focal length f = 0.20 m. An object is placed at do = 0.30 m. What is di?**

   A. 0.40 m

   B. 0.50 m

   C. 0.60 m

   D. 0.30 m

6. Which of the following is not a primary mechanism of heat transfer?

A. Conduction

B. Diffusion

C. Convection

D. Radiation

7. If a satellite's orbital radius increases from r to 4r, what happens to its orbital speed?

A. The speed becomes zero.

B. The speed doubles.

C. The speed becomes half.

D. The speed becomes one-quarter.

8. The hydrostatic pressure at depth h = 10 m in fresh water adds to atmospheric pressure. What is the total pressure at that depth (in Pa), ignoring air interface changes? Use P = P0 + ρ g h with P0 ≈ 101325 Pa.

A. About 101,325 Pa

B. About 150,000 Pa

C. About 250,000 Pa

D. About 199,325 Pa

9. A charged particle q = 1.6×10^-19 C moves with velocity v = 2.0×10^6 m/s perpendicular to a uniform magnetic field B = 0.50 T. What is the magnetic force on the particle?

A. 1.6×10^-14 N

B. 1.6×10^-13 N

C. 1.6×10^-12 N

D. 3.2×10^-13 N

10. Which force opposes motion between two surfaces that are in contact?

A. Friction

B. Normal Force

C. Work

D. Power

Answers

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

Explanations

1. Which term describes the path followed by a projectile near Earth's surface?

A. Free Fall

B. Range

C. Projectile Motion

D. Contact Force

Projectile motion describes the motion of an object launched into the air when gravity pulls downward and air resistance is small. The horizontal speed stays roughly constant while the vertical speed accelerates downward by g, so the resulting path is a curved, parabolic trajectory near Earth. Free fall describes only vertical motion under gravity with no horizontal movement, so it doesn't capture the full path of a launched projectile. Range tells how far it travels horizontally, not the shape of the path, and a contact force is just a type of force, not a description of the trajectory.

2. A data pair (x, y) follows y = m x + b. If x represents time and y represents position, what does the slope m represent in a physical context of motion?

A. The intercept b

B. The acceleration

C. The velocity at x = 0

D. The rate of change; e.g., velocity if y is position and x is time

When time is the independent variable and position is the dependent variable, the slope m tells how quickly position changes as time passes. That rate of change is velocity. In a linear relation y = m x + b, if x represents time, then the slope m is the velocity, since it equals dy/dt. The larger the slope, the faster position changes per second; the units work out to meters per second (assuming y is in meters and x in seconds). The intercept b simply represents where the object is at time zero, not how fast it's moving. Acceleration, on the other hand, is the rate at which velocity itself changes with time, which would require the slope to change with x; here the slope is constant, so acceleration is zero in this straight-line motion.

3. A 0.5 kg ball collides inelastically with a 0.5 kg ball at rest; after the collision they move together with velocity v. If the first ball's initial velocity is u, what is the final velocity?

A. v_final = u.

B. v_final = 2u.

C. v_final = 0.

D. v_final = 0.5u.

In collisions with no external forces, momentum is conserved. If the two 0.5 kg balls stick together, the total mass after the collision is 1.0 kg. The initial momentum comes only from the moving ball: p_i = (0.5 kg) × u = 0.5u. After sticking, they move as a single 1.0 kg object, so (1.0 kg) × v = 0.5u, giving v = 0.5u. So the final velocity is half of the initial velocity. (Kinetic energy isn't conserved in inelastic collisions—the momentum is, but some energy is lost to deformation, heat, etc.)

4. Which statement about collisions is true?

A. Kinetic energy is always conserved in all collisions.

B. Momentum is conserved in every collision.

C. Total energy is conserved in all collisions, but kinetic energy may not be.

D. Energy can be created or destroyed in collisions.

In a collision, the total energy of the system, if you account for all forms of energy, stays the same. That means kinetic energy, internal energy, deformation energy, heat, sound, and other forms can exchange energy among themselves, but the sum remains constant. If the bodies deform or heat up, some of the kinetic energy is converted into other forms, so the kinetic energy after the collision is not the same as before. Only in an ideal elastic collision would the kinetic energy be preserved as well. So the best statement is that total energy is conserved in all collisions, but kinetic energy may not be. The idea to keep in mind is that energy can change form during a collision, but the total amount doesn't vanish or appear from nowhere. The other options either claim kinetic energy is always conserved (which isn't true for inelastic collisions) or claim momentum is conserved in every collision without qualification (external forces can affect momentum exchange), or say energy can be created or destroyed (which would violate energy conservation).

5. A concave mirror has focal length f = 0.20 m. An object is placed at do = 0.30 m. What is di?

A. 0.40 m

B. 0.50 m

C. 0.60 m

D. 0.30 m

The key relation here is the mirror equation that links focal length, object distance, and image distance for a concave mirror. Using $1/f = 1/do + 1/di$ with f = 0.20 m and do = 0.30 m, you solve for di: $1/di = 1/f - 1/do = 1/0.20 - 1/0.30 = 5 - 3.333... = 1.666...$, so di = 0.60 m. The positive di means the image is real and forms in front of the mirror. The magnification is $m = -di/do = -0.60/0.30 = -2$, indicating the image is inverted and twice as large as the object. Therefore the image distance is 0.60 m.

6. Which of the following is not a primary mechanism of heat transfer?

A. Conduction

B. Diffusion

C. Convection

D. Radiation

Heat moves primarily through three mechanisms: conduction, convection, and radiation. Conduction is energy transfer through a material by particle interactions and lattice vibrations, convection involves the bulk movement of a fluid that carries energy with it, and radiation transfers energy via electromagnetic waves, which can occur even in empty space. Diffusion is the spread of particles from higher concentration to lower concentration due to random motion, a mass-transfer process. While energy can accompany diffusion in some situations, diffusion itself is not viewed as a primary way to transfer heat. Therefore, diffusion is not a main heat-transfer mechanism.

7. If a satellite's orbital radius increases from r to 4r, what happens to its orbital speed?

A. The speed becomes zero.

B. The speed doubles.

C. The speed becomes half.

<u>D. The speed becomes one-quarter.</u>

For an object in a circular orbit around a planet, the speed is set by the balance of gravity and circular motion: $v^2 = GM/r$, so the speed scales as $v \quad 1/\sqrt{r}$. If the orbital radius grows from r to 4r, the speed becomes $v = \sqrt{GM/(4r)} = (1/2)\sqrt{GM/r}$, meaning the speed is halved. The option claiming one-quarter would correspond to a different kind of scaling, which doesn't apply to a circular orbit. (If the orbit were not circular, you'd use the vis-viva equation, $v^2 = GM(2/r - 1/a)$, but the trend with increasing r still generally leads to lower speeds.)

8. The hydrostatic pressure at depth h = 10 m in fresh water adds to atmospheric pressure. What is the total pressure at that depth (in Pa), ignoring air interface changes? Use $P = P0 + \rho g h$ with $P0 \approx 101325$ Pa.

A. About 101,325 Pa

B. About 150,000 Pa

C. About 250,000 Pa

<u>D. About 199,325 Pa</u>

Pressure at depth comes from two parts: the atmospheric pressure at the surface and the hydrostatic pressure from the water column above. The total pressure is $P = P0 + \rho g h$. For fresh water, $\rho \approx 1000\ kg/m^3$ and $g \approx 9.8\ m/s^2$. At h = 10 m, the hydrostatic part is $\rho g h \approx 1000 \times 9.8 \times 10 = 98{,}000$ Pa. Adding the surface pressure $P0 \approx 101{,}325$ Pa gives about 199,325 Pa. So the total pressure is roughly 2.0×10^5 Pa ($\approx$ 199,000 Pa), which matches the given answer.

9. A charged particle $q = 1.6\times10^{-19}$ C moves with velocity $v = 2.0\times10^{6}$ m/s perpendicular to a uniform magnetic field B = 0.50 T. What is the magnetic force on the particle?

A. 1.6×10^{-14} N

<u>B. 1.6×10^{-13} N</u>

C. 1.6×10^{-12} N

D. 3.2×10^{-13} N

The magnetic force on a moving charge is $F = q v B \sin\theta$. Since the velocity is perpendicular to the magnetic field, $\sin\theta = 1$, so $F = q v B$. Plugging in $q = 1.6\times10^{-19}$ C, $v = 2.0\times10^{6}$ m/s, and B = 0.50 T gives $F = (1.6\times10^{-19})(2.0\times10^{6})(0.50) = 1.6\times10^{-13}$ N. For a positive charge, the force is perpendicular to both v and B, following the right-hand rule. The other options don't match this calculation (they differ by factors of 10 or 2), so this is the correct magnitude.

10. Which force opposes motion between two surfaces that are in contact?

A. Friction

B. Normal Force

C. Work

D. Power

Friction is the force that opposes motion between surfaces that are in contact. It acts parallel to the contact surface and points opposite to the direction of relative motion or the motion you're trying to cause. This is why pushing a book across a table feels like you're pushing against a resisting force—the friction is trying to keep the book from sliding. There are two kinds: static friction, which prevents motion up to a limit, and kinetic friction, which acts when surfaces slide against each other. The normal force, which is perpendicular to the surface, supports weight but does not oppose motion along the surface. Work and power describe energy transfer and rate of energy transfer, not a force that directly opposes 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://highschoolphysics.examzify.com

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