

Physics Registry 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

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- 1. The acoustic impedance of a transducer's matching layer is chosen primarily to:**
 - A. Improve the transmission into the body**
 - B. Have increased internal reflections**
 - C. Determine the operating frequency**
 - D. Vary with frequency of the transducer**

- 2. What is the key difference between endothermic and exothermic reactions?**
 - A. Endothermic reactions release energy while exothermic absorb energy**
 - B. Exothermic reactions do not involve energy changes**
 - C. Endothermic reactions absorb energy from surroundings**
 - D. Exothermic reactions absorb energy from surroundings**

- 3. Assuming oblique angle of incidence, what will the angle of transmission be if the propagation speed of medium 1 is greater than that of medium 2?**
 - A. Greater than the angle of incidence**
 - B. Less than the angle of incidence**
 - C. Equal to the angle of incidence**
 - D. Propagation speed does not influence the angle of transmission**

- 4. What does the work-energy principle state?**
 - A. The total energy of an object is conserved.**
 - B. The work done on an object equals the change in its kinetic energy.**
 - C. The power of an object is equal to the work done over time.**
 - D. The energy of an object is solely determined by its mass.**

- 5. What is torque a measure of?**
 - A. Translational force on an object**
 - B. Rotational force on an object**
 - C. Frictional force on an object**
 - D. Linear momentum of an object**

- 6. How does a lens focus light?**
- A. By reflecting light rays away from a focal point.**
 - B. By absorbing light rays.**
 - C. By refracting light rays towards a focal point.**
 - D. By scattering light in multiple directions.**
- 7. In soft tissue, what is the relationship between the attenuation coefficient and frequency?**
- A. Equal to frequency**
 - B. Equal to frequency x 2**
 - C. Equal to 1/2 the frequency**
 - D. Equal to frequency / 6**
- 8. What is Newton's Second Law of Motion?**
- A. It states that acceleration is directly proportional to mass**
 - B. It relates force, mass, and acceleration**
 - C. It defines the concept of inertia**
 - D. It describes the motion of objects at rest**
- 9. How is total mechanical energy calculated in a system?**
- A. $E = PE + KE$**
 - B. $E = Fd$**
 - C. $E = mgh + 1/2 mv^2$**
 - D. $E = Fv$**
- 10. What does increasing the number of focal zones generally do to the frame rate in ultrasound imaging?**
- A. Increases the frame rate**
 - B. Decreases the frame rate**
 - C. No effect on the frame rate**
 - D. Depends on the image depth**

Answers

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

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Explanations

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1. The acoustic impedance of a transducer's matching layer is chosen primarily to:

- A. Improve the transmission into the body**
- B. Have increased internal reflections**
- C. Determine the operating frequency**
- D. Vary with frequency of the transducer**

The correct answer focuses on the importance of matching layers in transducers and their role in optimizing acoustic performance. The acoustic impedance of a transducer's matching layer is selected to minimize the reflection of sound waves at the interfaces, particularly where the transducer meets the body. By ensuring that the impedance of the matching layer is closely aligned with that of the body tissue, there is a higher likelihood that sound waves will transmit effectively into the tissue rather than reflecting back into the transducer. This enhanced transmission is crucial as it allows for better imaging and diagnostic capabilities in medical ultrasound applications. In contrast, other options do not align with the primary purpose of the matching layer. Internal reflections are generally undesirable in this context as they can degrade the quality of the signal received. The operating frequency of a transducer is largely determined by factors such as the crystal material and design, rather than solely by the matching layer. Additionally, while some variations in impedance with frequency may occur, the design and purpose of the matching layer are primarily focused on achieving optimal acoustic transmission rather than responding to frequency changes.

2. What is the key difference between endothermic and exothermic reactions?

- A. Endothermic reactions release energy while exothermic absorb energy**
- B. Exothermic reactions do not involve energy changes**
- C. Endothermic reactions absorb energy from surroundings**
- D. Exothermic reactions absorb energy from surroundings**

The key difference between endothermic and exothermic reactions lies in how they interact with energy. In endothermic reactions, energy is absorbed from the surroundings, often in the form of heat, resulting in a decrease in the temperature of the surrounding environment. This is why we observe that these types of reactions often require an external source of energy to proceed. For example, in photosynthesis, plants absorb sunlight to convert carbon dioxide and water into glucose and oxygen, illustrating an endothermic process where energy input is necessary. In contrast, exothermic reactions release energy into the surroundings, typically in the form of heat, leading to an increase in the temperature of the surrounding environment. Combustion reactions, such as burning wood or fossil fuels, are classic examples of exothermic reactions where energy is released. The other choices present misunderstandings about these energy dynamics, with one incorrectly stating that endothermic reactions release energy, while another claims that exothermic reactions do not involve energy changes at all.

3. Assuming oblique angle of incidence, what will the angle of transmission be if the propagation speed of medium 1 is greater than that of medium 2?
- A. Greater than the angle of incidence
 - B. Less than the angle of incidence**
 - C. Equal to the angle of incidence
 - D. Propagation speed does not influence the angle of transmission

When light travels from one medium to another at an oblique angle, the relationship between the angles of incidence and transmission is governed by Snell's Law, which states that the ratio of the sines of the angles is equal to the ratio of the velocities in the two media. Mathematically, this can be expressed as: $\frac{\sin(\theta_1)}{\sin(\theta_2)} = \frac{v_1}{v_2}$ where (θ_1) is the angle of incidence, (θ_2) is the angle of transmission (or refraction), (v_1) is the speed of light in medium 1, and (v_2) is the speed of light in medium 2. In this scenario, when the propagation speed of medium 1 is greater than that of medium 2 (meaning $(v_1 > v_2)$), Snell's Law implies that the angle of transmission (θ_2) must be less than the angle of incidence (θ_1) . This is because a higher speed in the first medium leads to a greater angle associated with the same sine function compared to the

4. What does the work-energy principle state?

- A. The total energy of an object is conserved.
- B. The work done on an object equals the change in its kinetic energy.**
- C. The power of an object is equal to the work done over time.
- D. The energy of an object is solely determined by its mass.

The work-energy principle is a fundamental concept in physics that specifically links the work done on an object to the change in its kinetic energy. According to this principle, when work is performed on an object (through forces acting on it), it results in a change in the object's kinetic energy. This means that if you apply a force over a distance, the amount of work done will increase or decrease the speed of the object, which translates directly to a corresponding change in its kinetic energy. This principle is expressed mathematically as: $[W = \Delta K]$ where (W) represents the work done on the object, and (ΔK) represents the change in kinetic energy. Thus, when a net force acts on an object, and work is done on it, the total amount of energy in the form of kinetic energy will be altered based on the work input. In contrast, other options like the conservation of total energy or the relationship of energy and mass are distinct concepts that do not specifically address the connection between work and kinetic energy. The idea of power being the work done over time relates to how quickly work is performed, rather than the energy changes resulting from work. The notion that energy is solely dependent on mass overlooks other factors

5. What is torque a measure of?

- A. Translational force on an object
- B. Rotational force on an object**
- C. Frictional force on an object
- D. Linear momentum of an object

Torque is fundamentally a measure of rotational force on an object. It describes how effectively a force can cause an object to rotate about an axis. The concept of torque arises in situations where forces are applied at a distance from a pivot point or axis of rotation. The effectiveness of a force in producing rotational motion is influenced by both the magnitude of the force and the perpendicular distance from the line of action of the force to the pivot point, often referred to as the lever arm. In essence, torque is calculated as the product of the force applied and the distance from the pivot point to where the force is applied, factoring in the angle at which the force is applied. This means that even a small force applied at a great distance from the axis can produce a significant amount of torque, leading to greater rotational effects than a larger force applied closer to the axis. Therefore, when considering the dynamics of rotating bodies, torque plays a crucial role, as it governs the angular acceleration of an object in much the same way that force governs linear acceleration.

6. How does a lens focus light?

- A. By reflecting light rays away from a focal point.
- B. By absorbing light rays.
- C. By refracting light rays towards a focal point.**
- D. By scattering light in multiple directions.

A lens focuses light by refracting light rays towards a focal point. When light passes through a lens, the shape of the lens causes it to bend, or refract, the incoming light rays. This bending occurs because light travels at different speeds in different materials, such as air and glass. For a converging lens, which is thicker in the middle and thinner at the edges, parallel light rays entering the lens are bent inward and converge at a specific point known as the focal point. The degree of bending depends on the curvature of the lens and the refractive index of the material from which it is made. This phenomenon is essential in many optical devices, including glasses, cameras, and microscopes, where precise focus is necessary to produce clear images. The ability of a lens to change the direction of light ensures that images can be formed at various distances from the lens as light rays are redirected to meet at a common point. Other options involve processes that do not lead to focusing light correctly. For example, reflecting light away from a focal point or absorbing it would prevent the convergence necessary for focusing. Similarly, scattering light in multiple directions does not contribute to focusing but instead disperses the light.

7. In soft tissue, what is the relationship between the attenuation coefficient and frequency?

- A. Equal to frequency**
- B. Equal to frequency x 2**
- C. Equal to 1/2 the frequency**
- D. Equal to frequency / 6**

In soft tissue, the relationship between the attenuation coefficient and frequency indicates how sound waves lose energy as they propagate through the tissue. Specifically, the attenuation of ultrasound waves in soft tissues is generally observed to increase with frequency. This means that higher frequency waves experience greater attenuation compared to lower frequency waves. The correct choice suggests that the attenuation coefficient is inversely related to frequency, reflecting the phenomenon that as frequency increases, the attenuation coefficient becomes more significant. This is pertinent because ultrasound imaging relies on high-frequency waves that can provide detailed images, yet these waves are also absorbed more quickly by the tissue. In practical terms, this means that higher frequency sound waves will attenuate more rapidly than lower frequency waves, leading to a greater loss of signal and potentially reducing the depth of penetration in soft tissues. Understanding this relationship is crucial in ultrasound physics, where balancing frequency and attenuation is vital for optimizing imaging techniques.

8. What is Newton's Second Law of Motion?

- A. It states that acceleration is directly proportional to mass**
- B. It relates force, mass, and acceleration**
- C. It defines the concept of inertia**
- D. It describes the motion of objects at rest**

Newton's Second Law of Motion is fundamentally about the relationship between force, mass, and acceleration, which is precisely what is captured in your answer. The law states that the force acting on an object is equal to the mass of that object multiplied by its acceleration, often expressed in the formula $F = ma$. This highlights how an object's motion changes when a net force acts on it. Through this relationship, one can understand that a larger force results in greater acceleration if the mass remains constant. Conversely, for the same amount of force, an increase in mass will result in decreased acceleration. This principle plays an essential role in understanding how objects move and respond to forces in the physical world. The other options do address important concepts in physics but do not accurately reflect the essence of Newton's Second Law. For instance, discussing inertia pertains more to Newton's First Law, while the idea of describing motion at rest simply does not align with the core dynamics that Newton's Second Law addresses, which focuses on how forces affect motion.

9. How is total mechanical energy calculated in a system?

- A. $E = PE + KE$**
- B. $E = Fd$**
- C. $E = mgh + 1/2 mv^2$**
- D. $E = Fv$**

Total mechanical energy in a system is calculated by summing the potential energy (PE) and kinetic energy (KE). This relationship is foundational in physics because it illustrates the conservation of mechanical energy in ideal scenarios, where mechanical energy is neither added nor lost. Potential energy is the stored energy of an object based on its position or configuration, often described as gravitational potential energy when related to height above a reference point. Kinetic energy, on the other hand, is the energy of an object in motion and depends on its mass and velocity. By adding these two forms of energy together— $E = PE + KE$ —we obtain the total mechanical energy, which remains constant in the absence of non-conservative forces like friction. The other choices focus on different physical concepts. The second option involves work done by a force over a distance but does not account for both potential and kinetic energies. The third option specifically describes the mechanical energy in terms of PE and KE but uses explicit formulas, which is a subset of the more general expression in the first choice. The fourth option relates to power and the rate of doing work, which also does not encompass total mechanical energy.

10. What does increasing the number of focal zones generally do to the frame rate in ultrasound imaging?

- A. Increases the frame rate**
- B. Decreases the frame rate**
- C. No effect on the frame rate**
- D. Depends on the image depth**

Increasing the number of focal zones in ultrasound imaging typically decreases the frame rate. This occurs because each focal zone requires additional time for the ultrasound system to process the echoes returning from that zone, which leads to an increase in the total time needed to produce each image. In a single-focus imaging scenario, the ultrasound system optimizes the focus and captures echoes, allowing for a rapid frame rate. However, when multiple focal zones are used, the system must perform multiple transmissions and receptions, resulting in longer processing times. Consequently, the frame rate, which is the number of images produced per second, becomes lower since the system spends more time gathering data for each image. Other factors influencing image acquisition, like image depth, can also impact the frame rate, but the primary relationship with focal zones is a direct decrease due to the added complexity of processing multiple zones.

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://physicsregistry.examzify.com>

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

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