SQA National 5 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. 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 of the following is true about uranium used in nuclear energy?

A. It is completely unlimited

B. It produces more energy than fossil fuels

C. It causes significant air pollution

D. It requires larger quantities than fossil fuels

2. What does the symbol Q represent in physics?

A. Energy

B. Charge

C. Voltage

D. Current

3. What is the relationship between loss in gravitational potential energy and work done against resistive forces?

A. It is the same as the gain in potential energy

B. It equals gain in kinetic energy plus work done against resistive force

C. It equals kinetic energy only

D. It equals resistive force only

4. How many newton meters are in one joule?

A. 1 newton

B. 1 newton meter

C. 1 joule equals 2 newtons

D. 1 newton meter squared

5. What type of energy is produced from nuclear fission?

A. Potential energy only

B. Thermal energy only

C. Kinetic energy transferred to fission fragments

D. Chemical energy

6. How does friction operate in a car when the brakes are applied?

A. Brakes push the car forward

B. Pads rub against a disc creating resistance

C. Friction is eliminated

D. Increased speed is generated by friction

7. Which of the following describes the particles in a transverse wave?

A. Particles move in the same direction as the wave

B. Particles move at a right angle to the direction of the wave

C. Particles do not move at all

D. Particles move in a circular motion

8. What is the formula used to calculate absorbed dose?

A. Energy absorbed divided by time

B. Energy absorbed multiplied by mass

C. Energy absorbed divided by mass

D. Energy absorbed plus mass

9. Alpha particles can be stopped by which of the following?

A. Several meters of air

B. Plastic sheets

C. A few particles of air and sheet paper

D. Wood

10. How is work done calculated?

A. Force x time

B. Force x distance

C. Force + distance

D. Distance / time

Answers

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

Explanations

1. Which of the following is true about uranium used in nuclear energy?

A. It is completely unlimited

B. It produces more energy than fossil fuels

C. It causes significant air pollution

D. It requires larger quantities than fossil fuels

Uranium is a key fuel used in nuclear energy, and it indeed produces significantly more energy compared to fossil fuels. The process of nuclear fission in uranium releases a tremendous amount of energy from a relatively small amount of fuel. To put this into perspective, a single kilogram of uranium can produce millions of times more energy than a kilogram of coal, oil, or natural gas. This high energy density is one of the major reasons nuclear power is considered an effective energy source for meeting large-scale energy demands. In addition to its energy output, uranium does not generate the same emissions of carbon dioxide and other pollutants associated with burning fossil fuels, which further underscores why it is favored as a cleaner alternative. The extensive energy yield and lower greenhouse gas emissions during operation are crucial factors in discussions regarding sustainable energy sources.

2. What does the symbol Q represent in physics?

A. Energy

B. Charge

C. Voltage

D. Current

In physics, the symbol Q specifically represents electric charge. Charge is a fundamental property of matter that causes it to experience a force when placed in an electromagnetic field. It is measured in coulombs (C) and exists in two types: positive and negative. The movement of charge constitutes an electric current and is essential in the study of circuits, electrostatics, and many aspects of electromagnetism. The other symbols mentioned each represent different physical quantities: energy is typically denoted by E, voltage is often represented by V, and current is indicated by I. Understanding these symbols and their meanings is crucial in correlating them with their respective physical concepts and applications in problems involving electricity and circuits.

3. What is the relationship between loss in gravitational potential energy and work done against resistive forces?

A. It is the same as the gain in potential energy

B. It equals gain in kinetic energy plus work done against resistive force

C. It equals kinetic energy only

D. It equals resistive force only

The correct answer is based on the principle of conservation of energy, which states that energy cannot be created or destroyed, only transformed from one form to another. When an object loses gravitational potential energy, that energy is converted into other forms, such as kinetic energy or work done against resistive forces. In the scenario described, when an object moves downward in a gravitational field, it loses gravitational potential energy as it falls. This lost energy can either transform into kinetic energy, resulting in the object speeding up, or it can be used to do work against resistive forces such as friction or air resistance. Thus, the total loss in gravitational potential energy is equal to the sum of the gain in kinetic energy and the work done against resistive forces. This relationship is fundamental in physics, particularly when analyzing motion in gravitational fields and other energy transfer processes. In contrast, the other options do not accurately depict the relationship between the energy forms. The loss in potential energy does not equate solely to the gain in potential energy (as energy is conserved but transformed), kinetic energy alone does not account for resistive work, and resistive forces on their own do not encompass the entirety of energy transformation involved in the process.

4. How many newton meters are in one joule?

A. 1 newton

B. 1 newton meter

C. 1 joule equals 2 newtons

D. 1 newton meter squared

One joule is defined as the amount of energy transferred when a force of one newton is applied over a distance of one meter. This relationship can be expressed through the formula for work done: Work (in joules) = Force (in newtons) × Distance (in meters). When the force is one newton and the distance is one meter, the work done is exactly one joule. Thus, one joule can indeed be expressed as one newton meter, linking the units of force and distance in a coherent way. The other choices do not accurately represent the relationship between joules and newton meters. For instance, one newton is a unit of force, and one joule being equal to two newtons or newton meters squared does not correctly describe the work-energy principle. Hence, recognizing that one joule equals one newton meter reinforces the fundamental concepts of work and energy in physics.

5. What type of energy is produced from nuclear fission?

A. Potential energy only

B. Thermal energy only

C. Kinetic energy transferred to fission fragments

D. Chemical energy

Nuclear fission generates energy primarily through the kinetic energy of fission fragments. In the process of fission, a heavy nucleus splits into two or more smaller nuclei, known as fission fragments. This splitting releases a significant amount of energy, mainly in the form of kinetic energy. The fission fragments move apart at high speeds, and this motion contributes to the overall energy produced. Additionally, this kinetic energy can be transformed into thermal energy when the fragments collide with other atoms. However, the foundational energy release during fission is directly associated with the kinetic energy of these fragments. This released energy is what powers nuclear reactors and is harnessed in various applications, making it the primary focus when discussing the type of energy produced from nuclear fission. Other options do not capture the primary energy transformation taking place during fission. While nuclear reactions can produce thermal energy eventually, the initial energy release is due to the kinetic motion of the fission products.

6. How does friction operate in a car when the brakes are applied?

A. Brakes push the car forward

B. Pads rub against a disc creating resistance

C. Friction is eliminated

D. Increased speed is generated by friction

When the brakes are applied in a car, the brake pads come into contact with a disc (or drum, in some systems), generating friction between these two surfaces. This friction is crucial because it is the resistance caused by this interaction that slows the car down. The force of friction opposes the motion of the wheels, thereby converting kinetic energy into thermal energy, which is why the brakes can become hot after extended use. The effective operation of the braking system relies on the principle that friction can be used to reduce speed or bring a vehicle to a stop, making this a vital aspect of vehicle safety and performance. Without this frictional force, the car would not decelerate effectively, leading to longer stopping distances and potentially dangerous situations. The other options suggest scenarios that do not align with how braking systems function. For instance, the notion that brakes push the car forward or eliminate friction misunderstand the fundamental role of friction in stopping motion.

7. Which of the following describes the particles in a transverse wave?

A. Particles move in the same direction as the wave

B. Particles move at a right angle to the direction of the wave

C. Particles do not move at all

D. Particles move in a circular motion

In a transverse wave, the particles of the medium move at right angles to the direction in which the wave travels. This means that if the wave is moving horizontally, the particles oscillate vertically. This characteristic is what distinguishes transverse waves from other types of waves, such as longitudinal waves, where the particles move parallel to the wave direction. A common example of a transverse wave is a wave on a string or surface water waves. In both cases, as the wave propagates, you can observe that the individual particles are displaced up and down while the wave itself continues to move horizontally. This right-angle movement is a key feature of transverse wave behavior and is fundamental to understanding how these types of waves interact with their environment.

8. What is the formula used to calculate absorbed dose?

A. Energy absorbed divided by time

B. Energy absorbed multiplied by mass

C. Energy absorbed divided by mass

D. Energy absorbed plus mass

The absorbed dose is a measure of the energy deposited in a material or tissue by ionizing radiation and is calculated using the formula where the energy absorbed is divided by the mass of the material that absorbs the energy. This formula allows for the determination of the energy per unit mass that a substance has received from radiation, which is crucial for assessing potential biological effects and making medical treatment decisions. The absorbed dose is typically expressed in grays (Gy), where one gray is equivalent to one joule of energy absorbed per kilogram of matter. This relationship is fundamental in fields like radiology and radiation therapy, as it helps quantify the extent of radiation exposure. In contrast, other options do not correctly represent the concept of absorbed dose. For instance, energy absorbed divided by time relates to the concept of power rather than dose, while multiplying energy by mass does not yield a meaningful measure of radiation absorbed per unit mass. Lastly, adding energy absorbed and mass does not align with the principles of dose calculations either.

9. Alpha particles can be stopped by which of the following?

A. Several meters of air

B. Plastic sheets

C. A few particles of air and sheet paper

D. Wood

Alpha particles are relatively heavy and positively charged particles that are emitted during certain types of radioactive decay. Due to their mass and charge, alpha particles have limited penetration power compared to other forms of radiation such as beta particles or gamma rays. The correct answer indicates that alpha particles can be stopped by just a few particles of air or a sheet of paper, which highlights their low penetration ability. Even a thin barrier can effectively absorb and stop them, as they interact strongly with matter due to their charge. This strong interaction leads to a rapid loss of energy, preventing them from passing through solid materials or even thin layers of gas. In contrast, while options suggesting several meters of air, plastic sheets, and wood might imply greater barriers against radiation, alpha particles would not require such extensive obstacles to be stopped effectively. They would be absorbed much sooner than those scenarios suggest. Thus, the few particles within air or a thin sheet of paper are sufficient to completely halt the progress of alpha particles.

10. How is work done calculated?

A. Force x time

B. Force x distance

C. Force + distance

D. Distance / time

Work done is calculated as the product of the force applied to an object and the distance over which that force is applied, provided the force is in the direction of the motion. This relationship can be expressed with the formula: $$\text{Work} = \text{Force} \times \text{Distance}$$ When a force causes an object to move, the work done is directly related to how far the object travels in the direction of the applied force. For example, if you push a box across a floor, the amount of work you do increases with both the force of your push and the distance that the box moves. In contrast, the other options do not accurately represent the calculation of work done. Force multiplied by time does not correlate with work; it is related to impulse or momentum. Adding force and distance is not a valid operation in physics, as they measure different quantities and cannot be summed in this manner. Finally, dividing distance by time gives the speed of an object, not work. Thus, the correct understanding and calculation of work done hinges on the product of force and the distance moved in the direction of that force.

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://sqanational5physics.examzify.com

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