SQA NATIONAL 5 PHYSICS PRACTICE EXAM (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. **In a temperature-controlled circuit, what happens to the thermistor's resistance as it heats up?**

   A. It increases

   B. It decreases

   C. It remains constant

   D. It fluctuates

2. **Which equation represents the relationship between pressure and volume at constant temperature?**

   A. P1/T1 = P2/T2

   B. P1V1 = P2V2

   C. P = k/V

   D. P1V1/T1 = P2V2/T2

3. **What does specific heat capacity refer to?**

   A. The total energy of a material

   B. The energy required to heat 1kg of a material by 1 degree

   C. The mechanism of heat transfer

   D. The energy loss during phase changes

4. **What is the interaction that occurs when a rocket lifts off?**

   A. Between the rocket and the launch pad

   B. Between the rocket and the exhaust gases

   C. Between the rocket and air pressure

   D. Between the rocket and fuel

5. **What is absolute zero defined as in terms of gas pressure?**

   A. The pressure of a fixed mass of a gas is maximum

   B. The pressure of a fixed mass of an ideal gas is 0

   C. The pressure of a fixed mass of a gas is 1 atm

   D. The pressure of a fixed mass of a gas is negative

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6. What does the term 'gravitational field strength' refer to?

A. The weight of an object

B. The force of gravity per unit mass

C. The total energy in a gravitational field

D. The height of an object in a gravitational field

7. In which unit is absorbed dose measured?

A. Sv

B. Gy

C. J

D. kg

8. What does the term "equivalent dose" measure?

A. Only the absorbed dose of radiation

B. The biological effect of radiation on human tissue

C. The physical properties of radiation

D. The volume of radioactive waste generated

9. What is the term for the bending of waves as they pass around obstacles or through openings?

A. Reflection

B. Diffraction

C. Refraction

D. Dispersion

10. What does specific latent heat of vaporisation refer to?

A. Heat required to freeze a liquid

B. Energy needed to change 1kg of solid into 1kg of liquid

C. Energy required to change 1kg of liquid into 1kg of vapour at the same temperature

D. Heat needed to boil 1kg of solid

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Answers

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

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Explanations

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1. In a temperature-controlled circuit, what happens to the thermistor's resistance as it heats up?

A. It increases

B. It decreases

C. It remains constant

D. It fluctuates

In a temperature-controlled circuit using a thermistor, as the temperature increases, the resistance of the thermistor decreases. This relationship is characteristic of a thermistor, particularly a negative temperature coefficient (NTC) thermistor. In an NTC thermistor, higher temperatures provide more energy to the charge carriers in the material, allowing them to move more freely. As a result, the overall resistance drops when the temperature rises. This behavior makes thermistors particularly useful in temperature sensing and control applications because they can provide a clear and responsive change in resistance with temperature variations, enabling the circuit to adjust accordingly. The consistent decrease in resistance with increasing temperature reinforces the effectiveness of thermistors in various electronic applications, such as temperature sensors and electronic thermostats.

2. Which equation represents the relationship between pressure and volume at constant temperature?

A. P1/T1 = P2/T2

B. P1V1 = P2V2

C. P = k/V

D. P1V1/T1 = P2V2/T2

The equation that represents the relationship between pressure and volume at constant temperature is expressed through Boyle's Law, which is accurately captured by the equation P1V1 = P2V2. Boyle's Law states that for a given mass of gas at constant temperature, the product of its pressure and volume remains constant. This means that if the volume increases, the pressure decreases and vice versa, as long as the temperature does not change. In the context of the given equation, P1 and V1 represent the initial pressure and volume of the gas, while P2 and V2 represent the final pressure and volume after a change has occurred. This direct relationship shows that, upon rearranging or manipulating the equation, one can calculate the new pressure or volume if one of the conditions changes, provided the temperature remains constant throughout the process. The other options relate to different gas laws or principles but do not specifically represent the relationship between pressure and volume under constant temperature conditions as effectively as the equation derived from Boyle's Law does.

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3. What does specific heat capacity refer to?

A. The total energy of a material

B. The energy required to heat 1kg of a material by 1 degree

C. The mechanism of heat transfer

D. The energy loss during phase changes

Specific heat capacity refers to the amount of energy required to heat 1 kilogram of a material by 1 degree Celsius (or 1 Kelvin). This physical property indicates how much heat energy needs to be supplied to raise the temperature of a given mass of a substance, which varies from one material to another. The value of specific heat capacity allows for comparisons between the thermal properties of different substances, making it crucial for calculations related to heat transfer and temperature changes. Understanding specific heat capacity is essential in contexts such as thermal management, climate control, and energy conservation. It helps in predicting how much energy is needed to achieve desired temperature changes in materials, which can be important in both practical applications and experiments in physics.

4. What is the interaction that occurs when a rocket lifts off?

A. Between the rocket and the launch pad

B. Between the rocket and the exhaust gases

C. Between the rocket and air pressure

D. Between the rocket and fuel

The correct interaction that occurs when a rocket lifts off is between the rocket and the exhaust gases. This interaction is explained by Newton's third law of motion, which states that for every action, there is an equal and opposite reaction. When the rocket engines ignite, they expel exhaust gases downward at high speed. This action creates a force that propels the rocket upward as a reaction. The rocket's engines push against the gases, and the gases push back against the rocket with an equal force, enabling the rocket to lift off the ground. This principle is essential in understanding how rockets operate in space and throughout the atmosphere. While interactions with the launch pad, air pressure, and fuel are involved in the overall process of launching a rocket, they do not directly represent the primary mechanism that results in the lift-off. The force must be generated from the expulsion of exhaust gases to overcome the weight of the rocket and achieve flight.

5. What is absolute zero defined as in terms of gas pressure?

A. The pressure of a fixed mass of a gas is maximum

B. The pressure of a fixed mass of an ideal gas is 0

C. The pressure of a fixed mass of a gas is 1 atm

D. The pressure of a fixed mass of a gas is negative

Absolute zero is defined as the theoretical temperature at which a gas's pressure is zero when considering an ideal gas. According to the ideal gas law, which states that pressure is directly proportional to temperature, if you lower the temperature of a gas to absolute zero (0 Kelvin), the molecular motion theoretically comes to a complete halt. As a result, the gas would exert no pressure. This concept arises from kinetic theory, where temperature is related to the average kinetic energy of molecules. At absolute zero, the energy of the gas particles is minimized, and they cannot move any slower. Consequently, a fixed mass of an ideal gas would have a pressure of 0 at this temperature, reinforcing the definition of absolute zero. The other options do not align with the meaning of absolute zero in terms of gas pressure. For example, the idea of maximum pressure contradicts the behavior of gases at extremely low temperatures, while a fixed pressure of 1 atm does not relate to absolute zero, which is defined in terms of vanishing pressure. Negative pressure is a concept not observed in classical physics in the context of real gases under normal conditions.

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6. What does the term 'gravitational field strength' refer to?

A. The weight of an object

B. The force of gravity per unit mass

C. The total energy in a gravitational field

D. The height of an object in a gravitational field

Gravitational field strength refers to the force of gravity experienced by a unit mass at a given point in a gravitational field. This is quantitatively defined as the gravitational force acting on a 1 kilogram mass. Therefore, the gravitational field strength is commonly expressed in units of newtons per kilogram (N/kg). This concept highlights how strong the gravitational pull is in a specific location, which can vary based on factors such as the mass of the object creating the gravitational field and the distance from that object. For example, near the surface of the Earth, the gravitational field strength is approximately 9.81 N/kg, meaning that a 1 kg mass would experience a gravitational force of about 9.81 N. Understanding gravitational field strength is fundamental in physics, as it allows scientists to calculate how various objects will behave under the influence of gravity and to analyze orbital mechanics, weight, and motion.

7. In which unit is absorbed dose measured?

A. Sv

B. Gy

C. J

D. kg

Absorbed dose is a measure of the energy deposited by ionizing radiation in a material, typically tissue. The unit used for absorbed dose is the gray (Gy). One gray equates to the absorption of one joule of radiation energy per kilogram of the absorbing material. The gray is an important unit in radiation protection and medical physics as it helps quantify the amount of radiation absorbed by biological tissues, which is critical for assessing potential harm and for planning treatments in radiation therapy. Understanding absorbed dose in gray provides a consistent metric when discussing radiation exposure across different scenarios and materials. While the sievert (Sv) is also a unit related to radiation, it measures the biological effect of radiation rather than the physical energy absorbed, which distinguishes it from absorbed dose measured in grays. The joule (J) is a unit of energy but does not represent the amount of energy absorbed per unit mass, making it unsuitable as a standalone unit for absorbed dose. The kilogram (kg) denotes mass and does not relate directly to energy absorption at all. Thus, the gray (Gy) is the correct unit for absorbed dose.

8. What does the term "equivalent dose" measure?

A. Only the absorbed dose of radiation

B. The biological effect of radiation on human tissue

C. The physical properties of radiation

D. The volume of radioactive waste generated

The term "equivalent dose" refers to the biological effect of radiation on human tissue. It takes into account not only the amount of radiation energy absorbed by the tissue (which is measured as absorbed dose) but also the different effects that various types of radiation can have on living organisms. For example, alpha particles are more damaging than beta particles or gamma rays for the same amount of energy absorbed because of their higher mass and charge. The equivalent dose calculation applies a weighting factor to the absorbed dose based on the type of radiation and its biological impact. This is expressed in sieverts (Sv), which allows for a more accurate assessment of risk for various radiation types, thereby providing a measure that incorporates both the physical and biological effects of the radiation exposure. This distinction is important in fields such as healthcare, radiation protection, and radiological safety, as it guides decision-making and safety standards when dealing with radiation exposure.

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9. What is the term for the bending of waves as they pass around obstacles or through openings?

A. Reflection

B. Diffraction

C. Refraction

D. Dispersion

The bending of waves as they pass around obstacles or through openings is referred to as diffraction. This phenomenon occurs when a wave encounters an edge or a slit, causing it to spread out rather than travel in a straight line. Diffraction is most noticeable when the size of the obstacle or opening is comparable to the wavelength of the wave. In everyday examples, you can observe diffraction when sound waves bend around a corner, allowing you to hear someone speaking even if you cannot see them. Similarly, light waves can diffract when passing through narrow slits or around edges, which can lead to interesting patterns and effects in optical experiments. Diffraction is a fundamental principle in wave behavior, demonstrating how waves can exhibit properties that differ from those of particles. This contrasts with the other terms: reflection involves bouncing off a surface, refraction is the bending of waves due to a change in speed as they pass from one medium to another, and dispersion refers to the separation of waves into their constituent frequencies, often seen with light as it passes through a prism.

10. What does specific latent heat of vaporisation refer to?

A. Heat required to freeze a liquid

B. Energy needed to change 1kg of solid into 1kg of liquid

C. Energy required to change 1kg of liquid into 1kg of vapour at the same temperature

D. Heat needed to boil 1kg of solid

Specific latent heat of vaporisation is defined as the amount of energy required to convert 1 kilogram of a liquid into 1 kilogram of vapor without a change in temperature. During this phase change, the energy supplied is used to overcome the intermolecular forces holding the liquid molecules together. This process occurs at a constant temperature, which is essential in understanding the concept, as it emphasizes that the energy is not raising the temperature but facilitating the transition into the gaseous state. In this context, the correct answer highlights the necessity of recognizing the specific latent heat as a measure of energy associated with the change in state from liquid to vapor, distinguishing it from other forms of latent heat associated with different phase changes, such as fusion or freezing, or those involving solids, which do not pertain to the process of vaporization.

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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://sqanational5physics.examzify.com

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

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