

INTERNATIONAL GENERAL CERTIFICATE OF SECONDARY EDUCATION (IGCSE) PHYSICS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE

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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. In electronics, what do resistors do?**
 - A. Increase current flow
 - B. Calculate voltage
 - C. Limit current flow
 - D. Store electrical charge
- 2. Can insulators conduct charge?**
 - A. Yes, they can
 - B. No, they cannot
 - C. Only under certain conditions
 - D. Only if they are wet
- 3. What is a half-life in the context of radioactivity?**
 - A. The time taken for half of the radioactive atoms to decay
 - B. The time required for an atom to split
 - C. The duration taken for all radioactive atoms to decay
 - D. The measure of the stability of an atom
- 4. What role does gravity play in a galaxy?**
 - A. Only affects the formation of stars
 - B. Only governs the motion of planets
 - C. Holds the galaxy together and affects star movement
 - D. Prevents the formation of celestial bodies
- 5. What happens to the charge of two objects when they come into contact and then are separated?**
 - A. They maintain their charge
 - B. They exchange equal amounts of charge
 - C. They become oppositely charged
 - D. They become neutral
- 6. What is the primary function of cladding in optical fibers?**
 - A. To reflect light back into the core
 - B. To improve signal transmission speed
 - C. To protect the core from external damage
 - D. To change the angle of incidence

- 7. What do step-down transformers accomplish?**
- A. Increase voltage
 - B. Maintain voltage
 - C. Decrease voltage
 - D. Transform AC voltage to higher frequency
- 8. What phenomenon is described as the generation of electromotive force due to a change in magnetic field?**
- A. Electromagnetic Induction
 - B. Electrostatic Induction
 - C. Magnetic Resonance
 - D. Electromagnetic Radiation
- 9. What is the relationship between half-life and radioactive decay?**
- A. A longer half-life indicates faster decay
 - B. A shorter half-life indicates faster decay
 - C. Half-life is irrelevant to decay processes
 - D. Half-life measures the initial quantity of substance
- 10. What is meant by the term "one whole wave" in physics?**
- A. The complete cycle of voltage change
 - B. The total distance of one complete oscillation
 - C. One full cycle of charge movement
 - D. Energy transferred in one cycle

Answers

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

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Explanations

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1. In electronics, what do resistors do?

- A. Increase current flow
- B. Calculate voltage
- C. Limit current flow**
- D. Store electrical charge

Resistors play a fundamental role in electronic circuits by limiting the flow of electric current. When a voltage is applied across a resistor, it impedes the movement of electrons, thereby regulating the amount of current that can pass through. This property is crucial for protecting sensitive components from excessive current that could cause damage or malfunction. Resistors operate based on Ohm's Law, where the relationship between voltage (V), current (I), and resistance (R) is expressed as $V = I \times R$. This formula highlights how increasing resistance results in lower current flow for a given voltage. In contrast, some of the other options explore concepts that do not accurately define a resistor's function. Resistors do not increase current flow; their primary purpose is to reduce it. They also do not calculate voltage, as measuring voltage requires different instruments like voltmeters. Additionally, resistors do not store electrical charge; that characteristic is associated with capacitors, which temporarily hold electrical energy. Understanding the role of resistors is essential for effective circuit design and operation in various applications.

2. Can insulators conduct charge?

- A. Yes, they can
- B. No, they cannot**
- C. Only under certain conditions
- D. Only if they are wet

Insulators are materials that do not allow charge to pass through them easily. This is because their atomic structure does not permit free movement of electrons. In conductive materials, such as metals, electrons can move freely, allowing electric charge to flow. In contrast, insulators have tightly bound electrons that do not move easily, which means that they cannot conduct electricity. While there are some exceptional conditions, such as extreme electric fields or high temperatures, where insulator materials might become conductive, under normal circumstances, they are characterized by their inability to conduct electric charge. Therefore, the statement that insulators cannot conduct charge is accurate and aligns with the fundamental definition of insulators in physics.

3. What is a half-life in the context of radioactivity?

- A. The time taken for half of the radioactive atoms to decay**
- B. The time required for an atom to split
- C. The duration taken for all radioactive atoms to decay
- D. The measure of the stability of an atom

A half-life is defined as the time taken for half of the radioactive atoms in a sample to undergo decay. This concept is fundamental in understanding the behavior of radioactive materials and how they diminish over time. Radioactive decay is a random process at the level of individual atoms; however, the half-life provides a statistical measure that allows scientists to predict how long it will take for a certain proportion of a radioactive sample to decay. For instance, if you start with 100 radioactive atoms, after one half-life, you would have approximately 50 atoms remaining. After two half-lives, about 25 would remain, and so forth, following an exponential decay pattern. In contrast, the other options do not accurately represent the concept of half-life. For example, the time required for an atom to split is more related to nuclear fission processes rather than decay over time. The notion of the duration taken for all radioactive atoms to decay is misleading because, theoretically, some atoms may never decay, or it may take an impractically long time for this to happen. Lastly, while the stability of an atom can relate to the decay process, it is not quantitatively defined by the term "half-life." Thus, the chosen answer embodies the precise definition

4. What role does gravity play in a galaxy?

- A. Only affects the formation of stars
- B. Only governs the motion of planets
- C. Holds the galaxy together and affects star movement**
- D. Prevents the formation of celestial bodies

Gravity plays a crucial role in the structure and behavior of a galaxy. It acts as the fundamental force that binds the galaxy together, influencing the overall mass distribution and the dynamics of its components, such as stars, gas, dust, and dark matter. The gravitational attraction among these elements ensures that they remain in a cohesive structure, preventing them from dispersing into space. Moreover, gravity influences the movement of stars within the galaxy. As stars orbit the galactic center, their paths are dictated by the gravitational forces exerted by the massive core of the galaxy and the surrounding matter. This interaction not only shapes the orbits of stars but also plays a pivotal role in the processes of star formation and evolution over time. In contrast, the other options are too limited in scope, as they do not account for the comprehensive role gravity plays within the entirety of a galaxy's structure and dynamics. Gravity is much more than just a factor influencing star formation or planet motion; it is the very force that maintains the integrity of the galaxy as a whole.

5. What happens to the charge of two objects when they come into contact and then are separated?

- A. They maintain their charge
- B. They exchange equal amounts of charge**
- C. They become oppositely charged
- D. They become neutral

When two objects come into contact, charge can move between them due to the principle of electrostatic induction. If one object has an excess of electrons (negatively charged) and the other has a deficit (positively charged), electrons will flow from the negatively charged object to the positively charged one until electrical equilibrium is achieved. This means that they will exchange charge, resulting in both objects having the same amount of charge when they separate. Once separated, the objects will not maintain their original charges but instead will have exchanged equal amounts of charge, potentially leaving them either both neutrally charged or both charged either positively or negatively, depending on their initial charges. The key concept here is that the charge exchange occurs equally, ensuring that the total amount of charge is conserved in a closed system.

6. What is the primary function of cladding in optical fibers?

- A. To reflect light back into the core**
- B. To improve signal transmission speed
- C. To protect the core from external damage
- D. To change the angle of incidence

The primary function of cladding in optical fibers is to reflect light back into the core. Cladding is a material that surrounds the core of the optical fiber and is made from a different type of glass or plastic that has a lower refractive index than the core. This difference in refractive index is crucial because it enables total internal reflection to occur when light traveling through the core hits the boundary between the core and the cladding at a certain angle. As a result, the light is reflected within the core, allowing signals to be transmitted efficiently over long distances without significant loss. The mechanism of total internal reflection ensures that the light remains trapped within the core, thereby maintaining the integrity of the signal as it moves through the fiber. This fundamental feature is why cladding is essential for the function of optical fibers in telecommunications and data transmission. Other options may imply a role of cladding that is not its primary function. While protection from damage is a consideration for the design of optical fibers, the primary role of cladding focuses on optimizing light propagation through reflection. Signal transmission speed can be affected by various factors, but it is primarily determined by the properties of the core material and the wavelength of light rather than the cladding. Changing the angle of incidence is also

7. What do step-down transformers accomplish?

- A. Increase voltage
- B. Maintain voltage
- C. Decrease voltage**
- D. Transform AC voltage to higher frequency

Step-down transformers are specifically designed to reduce the voltage in an alternating current (AC) electrical system. They operate on the principle of electromagnetic induction and consist of two windings (the primary and secondary coils) wrapped around a magnetic core. When an alternating current flows through the primary winding, it generates a magnetic field that induces a current in the secondary winding. The key function of a step-down transformer is to decrease the voltage from the primary side to the secondary side. This is achieved by having more turns of wire in the primary coil than in the secondary coil. The ratio of the number of turns in the primary to the number of turns in the secondary determines the voltage reduction; thus, the output voltage is lower than the input voltage. In many practical applications, such as household electrical systems and power distribution, it is often required to step down high transmission voltages to safer, lower levels for use in homes and businesses. This makes step-down transformers essential for the safe delivery of electrical energy to consumers.

8. What phenomenon is described as the generation of electromotive force due to a change in magnetic field?

- A. Electromagnetic Induction**
- B. Electrostatic Induction
- C. Magnetic Resonance
- D. Electromagnetic Radiation

The phenomenon described as the generation of electromotive force due to a change in magnetic field is known as electromagnetic induction. This principle dictates that when there is a change in the magnetic environment of a conductor, an electric current is induced in that conductor. This effect was famously discovered by Michael Faraday and is foundational in the operation of electrical generators and transformers. In electromagnetic induction, the change in the magnetic field can be due to either the motion of a magnet relative to a coil of wire or a change in the strength or direction of the magnetic field itself. The greater the rate of change of the magnetic field, the greater the induced electromotive force. This phenomenon is a key principle underlying many technologies, including power generation and induction motors. The other listed phenomena do not involve the same mechanism. Electrostatic induction pertains to the redistribution of electric charges in an object due to the presence of a nearby charged object, which does not require a changing magnetic field. Magnetic resonance relates to the interaction of electromagnetic radiation with atomic nuclei in a magnetic field, primarily in medical imaging, while electromagnetic radiation refers to energy waves generated by oscillating electric and magnetic fields, rather than the induction of current due to a changing magnetic field.

9. What is the relationship between half-life and radioactive decay?

- A. A longer half-life indicates faster decay
- B. A shorter half-life indicates faster decay**
- C. Half-life is irrelevant to decay processes
- D. Half-life measures the initial quantity of substance

The relationship between half-life and radioactive decay is defined by how quickly a radioactive substance loses half of its original quantity over time. A half-life is the time required for half of the radioactive nuclei in a sample to decay. Therefore, substances that have shorter half-lives decay more quickly, resulting in a faster decrease in their quantity compared to those with longer half-lives. This characteristic directly links the concept of half-life to the decay process: the shorter the half-life, the faster the rate of decay. In contrast, a longer half-life would indicate a slower decay process, where the substance retains a significant amount of its original quantity for an extended period. The relevance of half-life to radioactive decay is central to understanding how different isotopes behave over time, reinforcing that it measures the time it takes for half of the substance to transform rather than any characteristics of the initial quantity itself.

10. What is meant by the term "one whole wave" in physics?

- A. The complete cycle of voltage change
- B. The total distance of one complete oscillation**
- C. One full cycle of charge movement
- D. Energy transferred in one cycle

The term "one whole wave" refers to the complete cycle of a periodic phenomenon, which is often represented graphically as a sine or cosine wave. This complete cycle encompasses all phases of the wave motion: starting from a certain point, rising to its peak or maximum, descending back to the starting point, continuing to its lowest point, and then returning to the starting point again. In the context of waves, distinguishing it as the total distance of one complete oscillation is crucial since it captures how far the wave travels during an entire cycle. This distance provides information about the wavelength, which is the distance between consecutive points that are in phase, such as crest to crest or trough to trough. Understanding this definition is essential in fields like acoustics, optics, and electromagnetic theory, where the behavior and characteristics of waves play significant roles. The other choices do not fully encompass the entire scope of what constitutes a "whole wave"; instead, they focus on specific aspects such as voltage changes, charge movement, or energy transfer over a cycle, which do not define the distance covered by the wave during one complete oscillation.

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://igcse-physics.examzify.com>

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

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