

International General Certificate of Secondary Education (IGCSE) 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. What materials are optical fibers made out of if the central core is surrounded by cladding with a lower refractive index?**
 - A. Plastic or glass**
 - B. Metal or wood**
 - C. Quartz or rubber**
 - D. Copper or aluminum**
- 2. How do airbags contribute to reducing the impact of a crash on passengers?**
 - A. They absorb energy from the crash.**
 - B. They reduce the speed of the vehicle.**
 - C. They provide cushioning for the passenger.**
 - D. They keep passengers in position during a crash.**
- 3. What builds up along with charge?**
 - A. Pressure**
 - B. Voltage**
 - C. Heat**
 - D. Mass**
- 4. What type of voltage does an AC generator primarily produce?**
 - A. Direct Voltage**
 - B. Alternating Voltage**
 - C. Constant Voltage**
 - D. High Voltage**
- 5. Which of the following involves heat transfer through gases?**
 - A. Conduction**
 - B. Convection**
 - C. Radiation**
 - D. All of the above**

- 6. Which force is responsible for the orbits of celestial objects?**
- A. Electromagnetic force**
 - B. Friction**
 - C. Gravity**
 - D. Inertia**
- 7. What is the primary use of gamma radiation in medicine?**
- A. Pain relief treatments**
 - B. Imaging and sterilization**
 - C. Bone growth stimulation**
 - D. Vaccination development**
- 8. What is the main use of an LDR?**
- A. To vary the voltage in a circuit**
 - B. To detect the presence of light**
 - C. To store electrical energy**
 - D. To control the circuit current**
- 9. Which symbol is used to represent a battery in a circuit diagram?**
- A. Cell**
 - B. Fuse**
 - C. Battery**
 - D. Capacitor**
- 10. 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**

Answers

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

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Explanations

1. What materials are optical fibers made out of if the central core is surrounded by cladding with a lower refractive index?

- A. Plastic or glass**
- B. Metal or wood**
- C. Quartz or rubber**
- D. Copper or aluminum**

Optical fibers are primarily made from materials such as plastic or glass. The structure of an optical fiber consists of a central core that is responsible for carrying light, which is surrounded by cladding that has a lower refractive index. This design is crucial for the principle of total internal reflection, which allows light to be transmitted efficiently through the fiber. The core, being made of materials like glass or plastic, provides the necessary transparency and refractive properties to transmit light signals effectively. Glass fibers offer low loss and high bandwidth, making them ideal for long-distance communication, while plastic fibers are often used for short-distance applications due to their flexibility and ease of handling. In contrast, the other materials listed in the options do not possess the suitable optical properties required for the functionality of optical fibers. Metals like copper and aluminum, while conductive, do not transmit light and are used for electrical signals rather than optical signals. Similarly, wood and rubber are not suitable because they do not have the necessary transparency or refractive indices for efficient light transmission.

2. How do airbags contribute to reducing the impact of a crash on passengers?

- A. They absorb energy from the crash.**
- B. They reduce the speed of the vehicle.**
- C. They provide cushioning for the passenger.**
- D. They keep passengers in position during a crash.**

Airbags contribute significantly to passenger safety during a crash primarily by providing cushioning. When a vehicle suddenly decelerates due to a collision, passengers experience rapid forward motion, which can result in serious injuries upon impact with hard surfaces, such as the steering wheel or dashboard. The airbags deploy instantly, creating a soft barrier that absorbs some of the force exerted on the passenger's body. This cushioning effect minimizes the risk of injury by distributing the impact force over a larger area and providing a more forgiving surface to come into contact with. By doing so, airbags effectively reduce the severity of injuries that could occur from hitting hard structures inside the car. While other factors, such as energy absorption and passenger positioning, are relevant to overall crash safety, the primary role of airbags is to absorb impact and cushion passengers, directly contributing to their safety in the event of a collision.

3. What builds up along with charge?

A. Pressure

B. Voltage

C. Heat

D. Mass

When charge builds up, it creates an electric field which leads to a difference in electric potential energy between two points; this is what we refer to as voltage. Voltage is essentially the measure of electric potential energy per unit charge and indicates the ability to do work by moving charges through a circuit or a conductive path. In practical terms, as charge accumulates in a region, such as in a capacitor, the voltage across the capacitor increases. This is a fundamental principle in electromagnetism, where charges exert electric fields and those fields result in the potential difference, or voltage, that can drive current in a circuit. The other options do not directly relate to the buildup of electric charge. For instance, pressure is a measure of force per area and is more commonly associated with fluids. Heat is a form of energy related to the motion of particles in matter but is not a direct effect of charge accumulation. Mass pertains to the amount of matter in an object and does not change due to electric charge buildup. Thus, voltage is the appropriate concept directly associated with the accumulation of charge.

4. What type of voltage does an AC generator primarily produce?

A. Direct Voltage

B. Alternating Voltage

C. Constant Voltage

D. High Voltage

An AC generator primarily produces alternating voltage because it generates electrical energy through the mechanical rotation of coils within a magnetic field. As the coils rotate, the direction of the induced current changes continuously, resulting in a voltage that varies sinusoidally over time. This characteristic of periodically reversing the voltage polarity is the defining feature of alternating voltage. In contrast, direct voltage refers to a constant flow of electrical charge in one direction, which is not produced by an AC generator. Constant voltage implies that the voltage remains the same, while high voltage refers to the magnitude of voltage but does not specify the type. The alternating nature of the voltage produced by an AC generator is essential for its applications, such as in powering household appliances and transmission over power lines, making the production of alternating voltage the primary function of this type of generator.

5. Which of the following involves heat transfer through gases?

A. Conduction

B. Convection

C. Radiation

D. All of the above

Heat transfer through gases primarily occurs via convection. Convection is the process where warmer regions of a fluid (which can be a gas or liquid) rise while cooler regions sink, creating a circulating flow that transfers heat. For example, when air is heated, it rises and displaces cooler air, allowing heat to spread throughout the gas. While conduction and radiation are also methods of heat transfer, they operate differently. Conduction involves the transfer of heat through direct contact between materials, typically more effective in solids than in gases. Radiation, on the other hand, involves the transfer of heat in the form of electromagnetic waves and does not require a medium, meaning it can occur in a vacuum. Since the question specifically asks about heat transfer through gases, convection is the most relevant mechanism.

6. Which force is responsible for the orbits of celestial objects?

A. Electromagnetic force

B. Friction

C. Gravity

D. Inertia

The gravitational force is the fundamental interaction that governs the motion of celestial objects in orbits. This force acts between two masses, with its strength varying according to the mass of the objects and the distance separating them, as described by Newton's law of universal gravitation. In the context of celestial bodies, it is gravity that keeps planets in orbit around stars, moons in orbit around planets, and so forth. When a celestial object moves in space, it continuously falls toward the larger mass due to gravity, but because of its forward velocity, it simultaneously moves sideways. This balance between the gravitational pull toward the larger mass and the tendency of the object to move in a straight line results in a curved path, or orbit. Other forces or concepts such as electromagnetic force, friction, and inertia play different roles in physics but are not responsible for the orbital motion of celestial objects. Electromagnetic force primarily affects charged particles, and while friction can influence motion, it is generally negligible in the vacuum of space where celestial objects move. Inertia describes an object's tendency to resist changes in motion, which complements the effects of gravity in enabling the orbits but does not provide the force necessary to create those orbits. Thus, gravity is the key force enabling the orbital motion.

7. What is the primary use of gamma radiation in medicine?

- A. Pain relief treatments
- B. Imaging and sterilization**
- C. Bone growth stimulation
- D. Vaccination development

Gamma radiation plays a crucial role in the field of medicine, particularly in imaging and sterilization. In medical imaging, gamma rays are used in procedures such as positron emission tomography (PET) scans which help in diagnosing various conditions by creating detailed images of the inside of the body. This allows for the visualization of metabolic processes and can reveal abnormal behavior of tissues, aiding in early disease detection. In addition to imaging, gamma radiation is widely utilized for sterilization of medical instruments and supplies. Its ability to penetrate materials effectively makes it an ideal method for eliminating bacteria, viruses, and other pathogens without damaging the devices. This ensures a high level of hygiene and safety in medical environments. Other options may involve their own beneficial uses in medicine, but they do not encompass the primary applications of gamma radiation as clearly as imaging and sterilization do.

8. What is the main use of an LDR?

- A. To vary the voltage in a circuit
- B. To detect the presence of light**
- C. To store electrical energy
- D. To control the circuit current

An LDR, or Light Dependent Resistor, is primarily used to detect the presence of light. This component changes its resistance based on the intensity of light falling on it—lowering its resistance in brighter light and increasing it in dimmer conditions. This property allows the LDR to act as a sensor in various applications, such as automatic lighting systems, where it can turn lights on or off depending on ambient light levels, or in devices like cameras to adjust exposure automatically. The other choices reflect functionalities that are not inherent to LDRs. Varying voltage in a circuit typically involves components like resistors or variable resistors (potentiometers), while storing electrical energy is primarily the role of capacitors or batteries. Controlling circuit current might involve different types of sensors or switches that are not specifically LDRs. Thus, the main and correct use of an LDR resides in its ability to detect light levels effectively.

9. Which symbol is used to represent a battery in a circuit diagram?

- A. Cell**
- B. Fuse**
- C. Battery**
- D. Capacitor**

In circuit diagrams, the symbol used to represent a battery is a combination of several cells connected together. This can vary depending on the specific design of the battery, but typically a battery symbol is depicted as two or more parallel lines, where one line is longer than the other. This symbolizes the positive and negative terminals of the battery. The chosen answer mentions "Battery," which is indeed the representation used in circuit diagrams to indicate a source of power made up of one or more electrochemical cells. A battery provides a stable voltage and the necessary current to power electrical devices and components within the circuit. Other components like a fuse, which is designed to protect the circuit from overcurrent by breaking the circuit if the current exceeds a certain level, and a capacitor, which stores electrical energy temporarily, have their own distinct symbols. The symbol for a cell typically represents a single electrochemical cell and is separate from the battery symbol. Understanding these distinctions is crucial for properly interpreting circuit diagrams and understanding the roles of different components.

10. 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

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!