IGCSE Physics – Electricity 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

1. What happens when an object gains electrons?

A. It becomes negatively charged

B. It becomes positively charged

C. It becomes neutral

D. It stops conducting electricity

2. The unit Ohm is denoted by which symbol?

A. Omega

B. Ampere

C. Volt

D. Watt

3. The resistance of a metal increases with temperature.

A. Increases with temperature

B. Decreases with temperature

C. Remains constant

D. Varies randomly

4. In the typical wiring described, the earth wire is at what potential?

A. 0 volts

B. 230 volts

C. 110 volts

D. 120 volts

5. Which statement correctly describes the direction of conventional current with respect to terminals?

A. From the positive terminal to the negative terminal.

B. From the negative terminal to the positive terminal.

C. There is no defined direction.

D. It alternates with each cycle.

6. Ohm's Law states the current that flows through a component is directly proportional to the voltage across the component.

- **A. Current is directly proportional to voltage**
- **B. Voltage is directly proportional to resistance**
- **C. Power is inversely proportional to current**
- **D. Resistance is proportional to voltage squared**

7. What does the earth wire do?

- **A. Connects the metal case of an appliance to earth if there is a fault**
- **B. Carries current away from the component**
- **C. Carries current to the live wire for safety**
- **D. Insulates the plug**

8. Conventional current flows from which terminal to which in a circuit diagram?

- **A. From the positive side of the battery to the negative side. This is the way current is drawn in circuit diagrams, even though it is wrong.**
- **B. From the negative side to the positive side.**
- **C. Along with the electron flow from negative to positive.**
- **D. In the direction of the magnetic field in the circuit.**

9. Which device trips when there is leakage current to protect a person from electric shock?

- **A. Residual current devices (RCDs)**
- **B. Circuit breakers**
- **C. Fuses**
- **D. Outer insulation**

10. How are semiconductors formed?

- **A. By heating or shining light on them to free electrons, turning insulators into conductors**
- **B. By cooling them to solidify**
- **C. By mixing metals with plastics**
- **D. By applying a magnetic field to align electrons**

Answers

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

Explanations

1. What happens when an object gains electrons?

A. It becomes negatively charged

B. It becomes positively charged

C. It becomes neutral

D. It stops conducting electricity

Gaining electrons adds negative charge because electrons carry a negative charge. Each extra electron increases the object's overall negative charge, so a neutral object becomes negatively charged, and an already negatively charged object becomes even more negative. This would not make the object positively charged—that happens when electrons are lost. Neutrality would require the total positive and negative charges to balance, which is not the result of simply gaining electrons.

2. The unit Ohm is denoted by which symbol?

A. Omega

B. Ampere

C. Volt

D. Watt

Electrical resistance is represented by the symbol Ω, which is the Greek letter Omega. This symbol is used to denote the ohm, the unit of resistance. It's defined as the resistance between two points where, with a constant temperature, a potential difference of 1 volt would drive a current of 1 ampere. The other units shown correspond to different quantities: amperes for current (A), volts for voltage (V), and watts for power (W). So the symbol for the ohm is Ω, commonly spoken as "Omega."

3. The resistance of a metal increases with temperature.

A. Increases with temperature

B. Decreases with temperature

C. Remains constant

D. Varies randomly

Metallic resistance changes with temperature because the metal's atoms vibrate more at higher temperatures, which makes it harder for free electrons to move. As temperature rises, lattice vibrations (phonons) scatter electrons more, so the resistivity increases. For many metals, this relationship is roughly linear over a moderate range and can be written as $R \approx R_0[1 + \alpha\Delta T]$, where α is a positive constant. That means the resistance increases when the temperature goes up. So the statement that resistance increases with temperature best fits how metals behave. A decrease would require a negative temperature coefficient, which doesn't apply to metals in general. Remaining constant would imply no change with temperature, which isn't correct for metals, and varying randomly would ignore the physical mechanism that links temperature to electron scattering.

4. In the typical wiring described, the earth wire is at what potential?

A. 0 volts

B. 230 volts

C. 110 volts

D. 120 volts

The earth wire provides a safety grounding path and is tied to the actual ground. Because it is connected to the earth, its potential is defined as zero volts, serving as a reference point for the system. This lets fault currents flow safely to the ground and triggers protective devices to disconnect the supply. In normal operation it carries little or no current. The live wire, by contrast, is at mains potential relative to earth (about 230 V in many countries). So the earth wire sits at 0 volts.

5. Which statement correctly describes the direction of conventional current with respect to terminals?

A. From the positive terminal to the negative terminal.

B. From the negative terminal to the positive terminal.

C. There is no defined direction.

D. It alternates with each cycle.

Conventional current is defined as the direction that positive charge would move in a circuit. In a DC source, this means current is considered to flow from the positive terminal through the external circuit to the negative terminal. So, when a battery powers a resistor, the current leaves the battery's positive terminal, goes through the resistor, and returns to the battery's negative terminal. Note that the actual charge carriers in most wires are electrons, which move from negative to positive, but the conventional current direction is defined opposite to that. The other possibilities don't fit: a fixed DC circuit has a defined direction from positive to negative, and alternating current would reverse direction over time, which isn't implied when talking about terminals in a steady DC scenario.

6. Ohm's Law states the current that flows through a component is directly proportional to the voltage across the component.

A. Current is directly proportional to voltage

B. Voltage is directly proportional to resistance

C. Power is inversely proportional to current

D. Resistance is proportional to voltage squared

The key idea is the linear link between current and voltage for a resistor: I = V/R. When the resistance is fixed, increasing the voltage across the component causes a proportional increase in current, so current is directly proportional to voltage. The constant of proportionality is 1/R, meaning doubling the voltage doubles the current if the resistance stays the same. This makes the stated idea the best description of Ohm's Law in this form. The other statements don't reflect how the variables relate in a simple resistor: voltage isn't determined solely by resistance, power does not decrease with current, and resistance isn't generally proportional to voltage squared for a Ohmic device. Non-ohmic components can have different, non-linear relationships, but for a resistor with constant resistance, the direct proportionality between current and voltage is the correct takeaway.

7. What does the earth wire do?

A. Connects the metal case of an appliance to earth if there is a fault

B. Carries current away from the component

C. Carries current to the live wire for safety

D. Insulates the plug

The earth wire provides a safe path for fault current to flow to the ground when something in the appliance goes wrong. It's connected to the metal casing and to the earth terminal in the plug, so if the insulation fails and a live wire touches the metal, the case can become live. The earth wire offers a low-resistance route for that fault current to go to the earth, which makes a large current flow and causes a fuse to blow or a circuit breaker to trip, cutting off the supply and protecting you from a shock. Normally it carries almost no current, which is why it isn't part of the normal circuit. It isn't there to carry current to the live wire, nor to insulate the plug.

8. Conventional current flows from which terminal to which in a circuit diagram?

A. From the positive side of the battery to the negative side. This is the way current is drawn in circuit diagrams, even though it is wrong.

B. From the negative side to the positive side.

C. Along with the electron flow from negative to positive.

D. In the direction of the magnetic field in the circuit.

Conventional current is defined as the flow of positive charge from higher electric potential to lower potential. In a simple circuit, that means current is considered to leave the positive terminal of the battery, pass through the components, and return to the negative terminal. In metal wires, the actual moving charge carriers are electrons, which are negative and move from the negative terminal toward the positive terminal, opposite to the conventional current direction. The magnetic field aspect isn't about the direction of current flow in diagrams; it's a separate effect that relates to how current creates magnetic fields. So the standard depiction of current in diagrams is from the positive end to the negative end.

9. Which device trips when there is leakage current to protect a person from electric shock?

A. Residual current devices (RCDs)

B. Circuit breakers

C. Fuses

D. Outer insulation

Protecting a person from electric shock relies on detecting leakage of current to earth and quickly cutting the power. A residual current device monitors the current in the live and neutral conductors and looks for any imbalance. Normally, the same amount of current flows in both wires. If some current leaks away—through a person or moisture to the earth—the current returning in the neutral is less, creating an imbalance. The RCD detects that difference and trips the circuit within milliseconds, removing the supply before a dangerous shock can occur. This is why it's the device designed for leakage protection. Other devices work differently: a circuit breaker trips when there is too much current overall (overcurrent) or a short circuit, protecting wiring from overheating but not specifically addressing leakage to earth. A fuse also responds to excessive current by melting open, which stops the current but requires replacement. Outer insulation is simply a insulating material; it doesn't actively trip or disconnect—its job is to reduce the chance of contact with live parts, not to protect against leakage.

10. How are semiconductors formed?

A. By heating or shining light on them to free electrons, turning insulators into conductors

B. By cooling them to solidify

C. By mixing metals with plastics

D. By applying a magnetic field to align electrons

Semiconductors conduct because they have a band gap between the valence band and the conduction band. In a pure material at room temperature, there aren't enough electrons in the conduction band, so it behaves like an insulator. When you heat the material or shine light on it, energy is supplied to electrons, enough to push some across the band gap into the conduction band. Those excited electrons (and the holes they leave behind) become charge carriers, allowing current to flow. This is the basic way semiconductors become conductive and is the principle behind devices like diodes and transistors. The other ideas don't create those free charge carriers: cooling wouldn't provide energy to cross the band gap, mixing metals with plastics isn't how semiconductors are formed, and aligning electrons with a magnetic field doesn't generate the necessary conduction.

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://igcsephysicselectricity.examzify.com

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