

TPC BASIC ELECTRICITY AND ELECTRONICS PRACTICE TEST (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. What does PWM stand for and what is its application?**
 - A. Pulse Width Modulation, used for controlling power to devices
 - B. Power Wave Modulation, used for data transmission
 - C. Pulse Wave Measurement, used for signal boost
 - D. Power Width Management, used for energy saving
- 2. In the metric system, potential energy is measured in what unit?**
 - A. Joules
 - B. Watts
 - C. Volts
 - D. Amperes
- 3. One complete cycle of alternating current is generated by a _____ degree rotation of a two-pole alternator.**
 - A. 180
 - B. 360
 - C. 270
 - D. 90
- 4. In terms of electrical safety, what does GFCI stand for?**
 - A. Ground Fault Current Indicator
 - B. Ground Fault Circuit Interrupter
 - C. General Fault Current Interceptor
 - D. Global Fault Circuit Isolator
- 5. A cathode in a diode carries what type of charge?**
 - A. Positive
 - B. Negative
 - C. Neutral
 - D. Variable
- 6. What happens to the total voltage in a series circuit?**
 - A. It remains constant across all components
 - B. It is divided among the components
 - C. It increases with each additional component
 - D. It decreases as the current increases

- 7. When two unlike magnetic poles are brought close together, they will:**
- A. Repel each other
 - B. Collapse into each other
 - C. Attract each other
 - D. Neither attract nor repel
- 8. Which of the following creates an electrical connection between two metal objects?**
- A. Grounding
 - B. Insulation
 - C. Bonding
 - D. Shielding
- 9. Which device is used to measure electrical current?**
- A. Voltmeter
 - B. Ampermeter
 - C. Ohmmeter
 - D. Capacitance meter
- 10. Which law describes the relationship between current (I), voltage (V), and resistance (R)?**
- A. Faraday's Law
 - B. Kirchhoff's Law
 - C. Ohm's Law
 - D. Newton's Law

Answers

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

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Explanations

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1. What does PWM stand for and what is its application?

- A. Pulse Width Modulation, used for controlling power to devices**
- B. Power Wave Modulation, used for data transmission
- C. Pulse Wave Measurement, used for signal boost
- D. Power Width Management, used for energy saving

PWM stands for Pulse Width Modulation, which is a technique used to control the amount of power delivered to electrical devices by varying the width of the pulses in a signal. This modulation enables more efficient energy use since it can reduce the average power supplied to a load without having to change the voltage. PWM is commonly applied in various areas such as motor speed control, light dimming, and heating applications. By adjusting the duty cycle (the proportion of time the signal is active versus inactive), it effectively manages how much power is delivered to a device. For instance, in motors, PWM can regulate speed without the need for complex circuitry, while in LED lighting, it allows for dimming options without changing the quality of the light output. This method is advantageous for energy efficiency and precision control, making it widely utilized in many electronic applications.

2. In the metric system, potential energy is measured in what unit?

- A. Joules**
- B. Watts
- C. Volts
- D. Amperes

In the metric system, potential energy is measured in joules. The joule is the standard unit of energy in the International System of Units (SI) and is defined as the amount of energy transferred when a force of one newton is applied over a distance of one meter. This makes it a fitting unit for measuring potential energy, which is the energy stored in an object due to its position or configuration, such as an object raised to a certain height in a gravitational field. The other options represent different physical quantities: watts measure power, which is the rate of energy transfer, volts measure electric potential or voltage, and amperes measure electric current. These units, while related to energy and electricity, do not directly measure energy in the same way that joules do. Understanding these distinctions clarifies why joules is the correct unit for expressing potential energy.

3. One complete cycle of alternating current is generated by a _____ degree rotation of a two-pole alternator.

- A. 180
- B. 360**
- C. 270
- D. 90

A complete cycle of alternating current is generated by a 360-degree rotation of a two-pole alternator because this full rotation corresponds to one complete swing of the electrical waveform, from zero to positive peak, back through zero to negative peak, and back to zero. In a two-pole alternator, as the rotor turns, the magnetic field induces an electromotive force (EMF) that alternates in polarity. This polarity change generates the alternating current. The fundamental principle here is related to the fact that one complete cycle of AC involves both a positive and negative half-cycle, thus requiring a full rotation of 360 degrees to complete the waveform. In other options, the other degrees are not sufficient to describe a full cycle. For example, a 180-degree rotation would result in only a half-cycle of the waveform, while 270 degrees and 90 degrees represent segments of the cycle, not the complete one. Therefore, it is this 360-degree rotational movement that fulfills the requirement for generating one full alternation in the provided context.

4. In terms of electrical safety, what does GFCI stand for?

- A. Ground Fault Current Indicator
- B. Ground Fault Circuit Interrupter**
- C. General Fault Current Interceptor
- D. Global Fault Circuit Isolator

GFCI stands for Ground Fault Circuit Interrupter. This device is essential for electrical safety, particularly in areas where moisture is present, such as kitchens, bathrooms, and outdoor settings. A GFCI monitors the current flowing through a circuit and can detect any imbalances that may indicate a ground fault, which occurs when electricity flows through an unintended path, such as water or a human body. The GFCI's primary function is to interrupt the flow of electricity very quickly—usually within milliseconds—when a fault is detected. This rapid response helps prevent electric shock and reduce the risk of electrical fires. By providing this critical protection, GFCIs play an important role in safeguarding individuals from the hazards associated with electrical faults, especially in wet or damp environments. Understanding this definition helps reinforce the importance of GFCIs in electrical safety protocols and highlights their functionality, which is vital for maintaining safe electrical systems in various settings.

5. A cathode in a diode carries what type of charge?

- A. Positive
- B. Negative**
- C. Neutral
- D. Variable

In a diode, the cathode is the terminal that is connected to the negative side of the power supply when the diode is forward-biased. This means that the cathode is where the electrons flow into the diode, making it the negatively charged terminal. When a diode is in operation, the electrons move from the cathode to the anode, where the flowing current is typically described as moving from positive to negative due to conventional current flow. Thus, the characteristic of the cathode carrying a negative charge is fundamental to its operation in directing the flow of electric current through the diode, allowing it to conduct in one direction while blocking it in the opposite direction. While it might be tempting to consider other charges at the cathode, such as positive or neutral, those do not align with the fundamental principles of diode operation. The fixed nature of charge carriers in semiconductors, which is determined by the doping process that creates the p-n junction, clearly establishes that the cathode inherently supports negative charge carriers—electrons—making it essential to understanding how diodes function in electrical circuits.

6. What happens to the total voltage in a series circuit?

- A. It remains constant across all components
- B. It is divided among the components**
- C. It increases with each additional component
- D. It decreases as the current increases

In a series circuit, the total voltage provided by the source is distributed among all the components connected in the circuit. Each component, such as resistors or other devices, will drop a certain amount of voltage according to its resistance and characteristics. The sum of the individual voltage drops across each component will equal the total voltage supplied by the source. This division of voltage occurs due to Ohm's Law, which states that the voltage across a component is equal to the current flowing through it multiplied by its resistance ($V = I \times R$). Because the current remains the same throughout a series circuit, different resistances will result in different voltage drops. Therefore, the correct understanding is that the total voltage is indeed divided among the components.

7. When two unlike magnetic poles are brought close together, they will:

- A. Repel each other
- B. Collapse into each other
- C. Attract each other**
- D. Neither attract nor repel

When two unlike magnetic poles are brought close together, they will attract each other. This phenomenon is based on the fundamental principles of magnetism, which state that opposite poles (north and south) generate a force that pulls them towards each other. This attractive force arises because the magnetic field lines emanating from a north pole spread out and connect to the south pole, creating a pathway for the lines of force to interact. This is in contrast to like poles (two north poles or two south poles), which repel each other due to their magnetic fields pushing against one another, demonstrating the principle that similar poles resist each other while opposing poles draw together. The attraction between unlike poles is a critical concept in understanding how magnets function and interact with each other in various applications, from simple compasses to complex electromechanical systems.

8. Which of the following creates an electrical connection between two metal objects?

- A. Grounding
- B. Insulation
- C. Bonding**
- D. Shielding

Creating an electrical connection between two metal objects is fundamentally achieved through bonding. Bonding involves connecting two or more metallic components together to ensure they have the same electrical potential. This minimizes the risk of dangerous voltage differences that could lead to electric shock or equipment damage. The process of bonding is crucial in electrical systems, especially in grounding applications, where it ensures that all metal parts are at the same electrical potential, thus providing safety and preventing electrical hazards. By ensuring that two metal objects are electrically connected, bonding helps to ensure stability within an electrical system, especially against various fault conditions. In contrast, grounding refers to connecting electrical circuits to the earth, insulation pertains to materials that prevent the flow of electricity, and shielding is used to protect sensitive components from electromagnetic interference. None of these other processes primarily focuses on creating a direct electrical connection between two metallic objects like bonding does.

9. Which device is used to measure electrical current?

- A. Voltmeter
- B. Ampermeter**
- C. Ohmmeter
- D. Capacitance meter

The device used to measure electrical current is known as an ammeter. This tool is specifically designed to measure the flow of electric charge in a circuit, typically expressed in amperes. By connecting an ammeter in series with the circuit, it can provide an accurate reading of the current flowing through that particular path. In contrast, a voltmeter measures the voltage across two points in a circuit, usually connected in parallel. An ohmmeter is used to measure resistance and is not capable of measuring current directly. Similarly, a capacitance meter measures the capacity of a capacitor and does not involve current measurement. Understanding the specific functions of each instrument is vital for effectively troubleshooting and analyzing electrical systems.

10. Which law describes the relationship between current (I), voltage (V), and resistance (R)?

- A. Faraday's Law
- B. Kirchhoff's Law
- C. Ohm's Law**
- D. Newton's Law

*The relationship between current (I), voltage (V), and resistance (R) is articulated by Ohm's Law. This fundamental principle states that the current flowing through a conductor between two points is directly proportional to the voltage across the two points and inversely proportional to the resistance of the conductor. Mathematically, it can be expressed as $V = I * R$, where V is voltage in volts, I is current in amperes, and R is resistance in ohms. Ohm's Law is essential in electrical engineering and physics because it provides critical insights into how circuits operate both in a theoretical and practical sense. Understanding this relationship is crucial for analyzing electric circuits, troubleshooting, and designing various electrical components. The other laws mentioned, while significant in their own contexts—such as Faraday's Law regarding electromagnetic induction, Kirchhoff's Laws concerning current and voltage in circuits, and Newton's Laws governing motion—do not specifically describe the direct relationship between current, voltage, and resistance as Ohm's Law does.*

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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://tpcbasicelectronics.examzify.com>

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

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