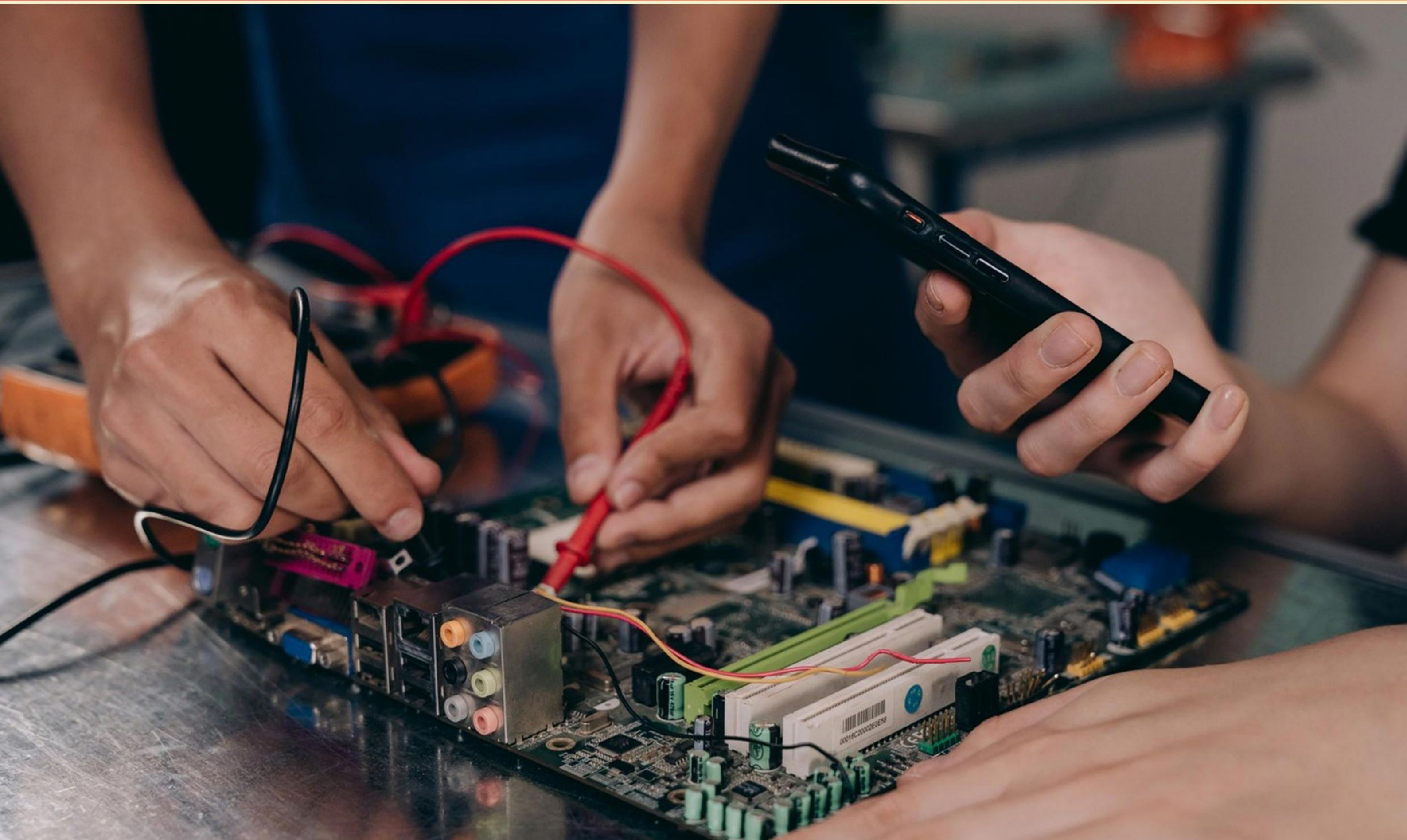
NEIEP ELECTRICAL FUNDAMENTALS (360) PRACTICE TEST (SAMPLE)

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.

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 is the primary functional difference between a fuse and a circuit breaker?

A. Fuse conducts until it melts; breaker trips and can be reset.

B. Breaker trips and can be reset; fuse melts and must be replaced.

C. Both devices operate identically and are interchangeable.

D. Breaker melts its element and needs replacement.

2. Period of a 25 Hz signal?

A. 0.04 s

B. 0.25 s

C. 4 s

D. 0.4 s

3. The average voltage is what multiplied by the peak value of one alternation?

A. 0.636 x peak

B. 1.0 x peak

C. 0.5 x peak

D. 2 x peak

4. What is the formula for three-phase apparent power in a balanced system?

A. $S = \sqrt{3} \times V_{LL} \times I_L$

B. $S = 3 \times V_{LL} \times I_L$

C. $S = \sqrt{2} \times V_{LL} \times I_L$

D. $S = V_{LL} \times I_L$

5. If an effective voltage is 100 VAC, what is the peak value?

A. 70.7 V

B. 141.4 V

C. 100 V

D. 200 V

6. In a delta-connected system, the line current relates to the phase current by which factor?

A. I_line = I_phase

B. I_line = √3 × I_phase

C. I_line = I_phase / √3

D. I_line = 3 × I_phase

7. What happens to total resistance and source current when more resistors are added in parallel?

A. The total resistance decreases; the source current decreases.

B. The total resistance decreases; the source current increases.

C. The total resistance increases; the source current increases.

D. The total resistance stays the same; the source current increases.

8. Which component is commonly used to improve power factor in electrical systems?

A. Capacitor banks

B. Inductors

C. Transformers

D. Resistors

9. In a sawtooth waveform, where is the zero reference point located?

A. At the positive peak.

B. Halfway between positive and negative peaks.

C. At the negative peak.

D. At one quarter period after the positive peak.

10. What is the formula for reactive power in a circuit with voltage, current, and phase angle?

A. Q = V × I × sin φ.

B. Q = V × I × cos φ.

C. Q = V / I.

D. Q = P × tan φ.

Answers

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

Explanations

1. What is the primary functional difference between a fuse and a circuit breaker?

A. Fuse conducts until it melts; breaker trips and can be reset.

B. Breaker trips and can be reset; fuse melts and must be replaced.

C. Both devices operate identically and are interchangeable.

D. Breaker melts its element and needs replacement.

The main idea is how each device stops current after an overload and whether it is reusable. A fuse carries current normally until a fault causes its thin metal element to heat up and melt, opening the circuit; once it has blown, it must be replaced. A circuit breaker detects the fault and trips to open the circuit, but it can be reset afterward by flipping the switch once the fault is cleared. So the fuse is sacrificial and single-use, while the breaker is resettable and reusable. That's why the correct description is that a fuse conducts until it melts and must be replaced, whereas a breaker trips and can be reset.

2. Period of a 25 Hz signal?

A. 0.04 s

B. 0.25 s

C. 4 s

D. 0.4 s

Frequency is how many cycles occur each second, and the period is the time for one cycle. The period T is the reciprocal of the frequency f, so $T = 1/f$. For 25 Hz, $T = 1/25$ seconds, which equals 0.04 s. So each cycle lasts 0.04 seconds. The other numbers would correspond to different frequencies (for example, 0.25 s is a cycle time for 4 Hz, 4 s for 0.25 Hz, and 0.4 s for 2.5 Hz), not for 25 Hz.

3. The average voltage is what multiplied by the peak value of one alternation?

A. 0.636 x peak

B. 1.0 x peak

C. 0.5 x peak

D. 2 x peak

The average value of a full-wave rectified sine is $2/\pi$ times the peak, which is about 0.636 of the peak. If you take $v(t) = V_p \sin \theta$ and find the average of its absolute value over a full cycle, you compute $(1/2\pi) \int_0^{2\pi} |V_p \sin \theta| \, d\theta$. The integral of $|\sin \theta|$ over a full cycle is 4, so the average becomes $(V_p/(2\pi)) \times 4 = 2V_p/\pi \approx 0.636 V_p$. So the correct description is that the average voltage is 0.636 times the peak value.

4. What is the formula for three-phase apparent power in a balanced system?

A. $S = \sqrt{3} \times V_{LL} \times I_L$

B. $S = 3 \times V_{LL} \times I_L$

C. $S = \sqrt{2} \times V_{LL} \times I_L$

D. $S = V_{LL} \times I_L$

In a balanced three-phase system, the total apparent power is found by summing the per-phase powers. Each phase has a voltage of V_phase and current I_phase, and if the load is balanced, all three phases contribute equally: S = 3 V_phase I_phase. For a star (Y) connection, the phase voltage is V_phase = V_LL / √3, and the line current equals the phase current, I_phase = I_L. Substituting gives S = 3 (V_LL / √3) I_L = √3 V_LL I_L. So the three-phase apparent power is the product of the line-to-line voltage, the line current, and √3. The other options don't match this relationship: using 3 × V_LL × I_L would be too large by a factor of √3, √2 × V_LL × I_L introduces an unnecessary √2 factor, and V_LL × I_L alone represents a single-phase power, not the total three-phase power.

5. If an effective voltage is 100 VAC, what is the peak value?

A. 70.7 V

B. 141.4 V

C. 100 V

D. 200 V

In a sinusoidal AC waveform, the RMS (effective) voltage is the peak voltage divided by sqrt(2). So the peak value is the RMS voltage times sqrt(2). For 100 V RMS, the peak is 100 × sqrt(2) ≈ 141.4 V. This is the maximum instantaneous voltage of the waveform. 70.7 V would be the RMS value corresponding to a 100 V peak, not the peak for a 100 V RMS. 100 V would imply the peak and RMS are the same, which isn't true for a sine wave. 200 V would mean the peak is double the RMS, which also doesn't fit a sine relationship.

6. In a delta-connected system, the line current relates to the phase current by which factor?

A. I_line = I_phase

B. I_line = √3 × I_phase

C. I_line = I_phase / √3

D. I_line = 3 × I_phase

In a delta-connected system, the current in each line is not the same as the current in a single winding. Each line carries the difference between the two phase currents that meet at that line. For a balanced set of phase currents, those two winding currents have the same magnitude and are 120 degrees apart. The line current is the vector difference of two 120-degree-apart phasors, so its magnitude is found by the phasor sum: I_line = sqrt(I_phase^2 + I_phase^2 − 2 I_phase^2 cos(120°)). Since cos(120°) = −1/2, this becomes sqrt(2I_phase^2 + I_phase^2) = sqrt(3 I_phase^2) = √3 × I_phase. So the line current is √3 times the phase current.

7. What happens to total resistance and source current when more resistors are added in parallel?

A. The total resistance decreases; the source current decreases.

B. The total resistance decreases; the source current increases.

C. The total resistance increases; the source current increases.

D. The total resistance stays the same; the source current increases.

When resistors are added in parallel, the equivalent resistance drops because each new path provides another way for current to flow, effectively lowering the resistance seen by the source. With the same voltage from the source, a smaller resistance means a larger current (Ohm's law: I = V/R). The total source current is the sum of all branch currents, so adding another parallel path increases the overall current. Therefore, the total resistance decreases and the source current increases.

8. Which component is commonly used to improve power factor in electrical systems?

A. Capacitor banks

B. Inductors

C. Transformers

D. Resistors

Improving power factor means reducing the phase difference between voltage and current by compensating reactive power. Inductive loads like motors and transformers cause current to lag the voltage, which lowers the power factor. Capacitors provide leading reactive power; when you place capacitor banks in the system, they supply this leading current locally, counteracting the lag from inductive loads. That makes the overall current more in phase with the voltage, increasing the power factor toward unity. Better power factor means less circulating reactive current, which reduces losses in conductors and can lower demand charges for the facility. The other components don't provide this corrective effect: inductors add lagging reactive power, while transformers and resistors don't offer the leading reactive power needed for correction.

9. In a sawtooth waveform, where is the zero reference point located?

A. At the positive peak.

B. Halfway between positive and negative peaks.

C. At the negative peak.

D. At one quarter period after the positive peak.

The zero reference point is where the waveform crosses zero volts. For a standard sawtooth that linearly sweeps from a negative peak to a positive peak in each cycle, the ramp is uniform, so it crosses zero exactly halfway between the negative peak and the positive peak. In other words, the zero crossing occurs mid-ramp, which is halfway through the period. It's not at a peak, and it isn't a quarter-period after the positive peak.

10. What is the formula for reactive power in a circuit with voltage, current, and phase angle?

A. $Q = V \times I \times \sin \varphi$.

B. $Q = V \times I \times \cos \varphi$.

C. $Q = V / I$.

D. $Q = P \times \tan \varphi$.

Reactive power tells you how much of the power is just sloshing back and forth due to the phase difference between voltage and current. Its direct expression uses the sine of the phase angle: $Q = V \times I \times \sin \varphi$. The sine picks out the portion of the power that is 90 degrees out of phase with the work-producing component, which is why it represents reactive energy exchange rather than real work done. For context, real power is $P = V \times I \times \cos \varphi$, which is the portion that actually does work (dissipated as heat or stored temporarily in fields). The total power flow magnitude, or apparent power, is $S = V \times I$. Also, since $\tan \varphi = Q/P$, you could write $Q = P \times \tan \varphi$, but the most direct and commonly used formula that involves voltage, current, and the phase angle is $Q = VI \sin \varphi$. $V \times I$ alone isn't a power value, and $V \div I$ isn't a power relationship.

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://neiep360.examzify.com

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