NEIEP Electrical Fundamentals (360) 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 does the term phase relate to?

A. The relationship of one sine wave to another in terms of time delay

B. The relationship of one sine wave to another in terms of electrical degrees

C. The amplitude difference between two sine waves

D. The frequency difference between two sine waves

2. Which formula describes the power in a resistive AC circuit in terms of RMS voltage and resistance?

A. V_rms^2 / R

B. V_peak^2 / R

C. V_rms × I_rms

D. V_peak × I_peak

3. What makes up one cycle?

A. A single positive half-cycle

B. The combined positive and negative alternations

C. The peak voltage only

D. A single negative half-cycle

4. In a three-phase system, the line-to-line voltage is how many times the line-to-neutral voltage?

A. 1.0

B. 1.732

C. 2.0

D. 3.0

5. An AC voltage has an average (mean) value of 72 V. Its RMS value is approximately what?

A. 72

B. 60.0

C. 113.2

D. 80.03

6. What is the average value of one complete cycle if the positive and negative alternations are the same?

A. The peak value

B. The average value

C. The RMS value

D. The peak-to-peak value

7. If the RMS current is 20.2 A, what is the peak value?

A. 14.1 A

B. 20.2 A

C. 15.0 A

D. 28.6 A

8. The frequency of an AC signal is inversely related to what other quantity?

A. Resistance

B. Capacitance

C. Inductance

D. Period

9. Period of a 25 Hz signal?

A. 0.04 s

B. 0.25 s

C. 4 s

D. 0.4 s

10. Which statement is true about RMS values for sine waves?

A. They are less than the peak value

B. They are equal to the peak value

C. They are greater than the peak value

D. They are unrelated to the peak value

Answers

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

Explanations

1. What does the term phase relate to?

A. The relationship of one sine wave to another in terms of time delay

B. The relationship of one sine wave to another in terms of electrical degrees

C. The amplitude difference between two sine waves

D. The frequency difference between two sine waves

Phase describes how far one sine wave is shifted relative to another within a cycle, and it's measured in electrical degrees. This tells you whether the waves line up or one leads or lags the other, with 0° meaning they peak together, and 90° or 180° indicating quarter- or half-cycle differences. It's about the timing relationship between waves, not their height (amplitude) or how fast they repeat (frequency). A time delay can produce a phase shift, but in practice we express that shift in degrees for AC analysis.

2. Which formula describes the power in a resistive AC circuit in terms of RMS voltage and resistance?

A. V_rms^2 / R

B. V_peak^2 / R

C. V_rms × I_rms

D. V_peak × I_peak

In a resistive AC circuit, the instantaneous power is p(t) = v(t) i(t). Since a resistor has i(t) = v(t)/R, this becomes p(t) = v^2(t)/R. The average (real) power over time is P = V_rms^2 / R, because V_rms is the effective voltage that accounts for heating in the resistor. This form directly uses RMS voltage and resistance, which is why it's the correct expression for power in this context. While P can also be written as V_rms I_rms in a purely resistive circuit (since I_rms = V_rms / R), the formula that explicitly involves RMS voltage and resistance is V_rms^2 / R. Using peak values would not reflect the average power delivered.

3. What makes up one cycle?

A. A single positive half-cycle

B. The combined positive and negative alternations

C. The peak voltage only

D. A single negative half-cycle

A cycle in alternating current is the complete progression of the waveform through both halves of its swing. It starts at a point (such as a zero crossing), goes through a positive half-cycle to the positive peak, returns through zero to the negative half-cycle, reaches the negative peak, and then returns to the starting point. In other words, one cycle includes both the positive and the negative alternations. The period is the time it takes to complete this full sweep, and the frequency is how many cycles occur each second. If you look at only a single positive half-cycle or a single negative half-cycle, you're looking at half of the cycle, not the whole thing. The peak voltage is just a single point within the cycle, not the entire loop. So the full cycle is made up of the combined positive and negative halves.

4. In a three-phase system, the line-to-line voltage is how many times the line-to-neutral voltage?

A. 1.0

B. 1.732

C. 2.0

D. 3.0

In a balanced three-phase system, the line-to-line voltage is the vector difference between two phase voltages that are 120 degrees apart. The line-to-neutral voltage is the voltage of a single phase with respect to neutral. When you subtract two phase voltages 120° apart, the magnitude works out to sqrt(3) times the phase voltage: V_LL = sqrt(V_Ph^2 + V_Ph^2 − 2 V_Ph^2 cos 120°) = sqrt(3) · V_Ph. So the line-to-line voltage is sqrt(3) times the line-to-neutral voltage, which is about 1.732 times larger.

5. An AC voltage has an average (mean) value of 72 V. Its RMS value is approximately what?

A. 72

B. 60.0

C. 113.2

D. 80.03

RMS is the effective DC value that would produce the same heating as the AC waveform. For a sine wave, the average value of the rectified (absolute) voltage is Vavg = 2 Vpeak / π, while the RMS value is Vrms = Vpeak / √2. The ratio Vrms / Vavg for a sine wave is π / (2√2) ≈ 1.1107. So Vrms ≈ Vavg × 1.1107. With Vavg = 72 V, Vrms ≈ 72 × 1.1107 ≈ 80.0 V. Therefore the RMS value is about 80 V.

6. What is the average value of one complete cycle if the positive and negative alternations are the same?

A. The peak value

B. The average value

C. The RMS value

D. The peak-to-peak value

When a waveform spends equal time above and below zero with the same magnitudes, the areas of positive and negative portions cancel over one full cycle. That makes the average (DC) value of the cycle zero. The option that matches this idea is the average value, since it describes the constant level you'd get if you averaged the waveform over a complete cycle. The peak value is just the maximum magnitude, RMS is about heating effect and not the average, and peak-to-peak is the total swing from top to bottom, not the average.

7. If the RMS current is 20.2 A, what is the peak value?

A. 14.1 A

B. 20.2 A

C. 15.0 A

D. 28.6 A

For a sinusoidal current, the peak value is the RMS value multiplied by the square root of 2. This comes from how RMS measures the effective heating effect of a sine wave, while the peak is the maximum instantaneous current. So with an RMS of 20.2 A, the peak is 20.2 × √2 ≈ 20.2 × 1.414 ≈ 28.6 A. The peak must be larger than the RMS, which is why 28.6 A is the correct peak value. The other numbers would arise from using the wrong relation (for example, dividing by √2 would give about 14 A, which is not the peak).

8. The frequency of an AC signal is inversely related to what other quantity?

A. Resistance

B. Capacitance

C. Inductance

D. Period

Frequency and period are reciprocal ideas. Frequency is how many cycles occur each second, while period is how long one complete cycle takes. By definition, f = 1/T, so they are inversely related: when the period gets longer, fewer cycles fit into a second, and the frequency drops; when the period shortens, the frequency rises. For a quick sense: a cycle that lasts 0.01 seconds gives 100 cycles per second (100 Hz). If that same cycle takes 0.02 seconds, you get 50 Hz. The other quantities—resistance, capacitance, and inductance—affect how a circuit behaves and can influence frequency in specific configurations (like LC resonant circuits where f = 1/(2π√(LC))), but the universal inverse relationship is between frequency and period.

9. 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.

10. Which statement is true about RMS values for sine waves?

A. They are less than the peak value

B. They are equal to the peak value

C. They are greater than the peak value

D. They are unrelated to the peak value

The RMS value represents the effective voltage that would produce the same heating in a resistor as the actual AC waveform. For a sine wave with peak voltage Vp, the instant value is v(t) = Vp sin(ωt). When you average the square of this over a full cycle, you get Vrms^2 = (1/T) ∫ Vp^2 sin^2(ωt) dt = Vp^2/2, so Vrms = Vp/√2 ≈ 0.707 Vp. This means the RMS value is always smaller than the peak value for a sine wave (about 29% lower). The peak is the maximum instantaneous voltage, while RMS reflects the waveform's effective power, which is why the statement that RMS values are less than the peak value is true.

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!