Electrical Engineering Fundamentals Interview Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

Table of Contents

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 charge?
    - A. The rate of flow of electricity
    - B. Value for electricity flowing in a circuit
    - C. The opposition to current flow
    - D. The pressure that pushes electricity through an electrical circuit

2. In terms of energy behavior, which statement about reactance is accurate?
    - A. It dissipates energy as heat in a resistor
    - B. It has no effect on energy flow
    - C. It converts energy into light
    - D. It stores energy and releases it after a quarter cycle

3. For maximum power transfer, how must the load resistance compare to the source resistance?
    - A. Load resistance must be zero
    - B. Load resistance must be greater than the source resistance
    - C. Load resistance must equal the source resistance
    - D. Load resistance must be double the source resistance

4. In a three-phase system, the three wires carry the power with a neutral used for grounding.
    - A. Two wires
    - B. Three wires with a neutral
    - C. Four wires with a neutral
    - D. Three wires without a neutral

5. If the resistance in a series circuit doubles, what happens to the current?
    - A. The current doubles
    - B. The current remains the same
    - C. The current is halved
    - D. The current becomes zero

6. **Capacitors in series have an equivalent capacitance equal to what?**

   A. The reciprocal of the sum of reciprocals

   B. The sum of their capacitances

   C. The product of the capacitances

   D. The difference of the capacitances

7. **What is a magnetic field?**

   A. The region around a magnet where a force acts on another magnet or on a magnetic material

   B. A region where electric charges move at high speed

   C. A field that stores electrical energy in capacitors

   D. A region that can convert mechanical energy into heat

8. **If a source has no reactance, maximum power transfer occurs when the load resistance equals the source resistance.**

   A. True

   B. False

   C. Only with DC

   D. Only with AC

9. **How does an AC generator work?**

   A. A simple ac generator consists of a coil rotated in a magnetic field. As the coil rotates the magnetic flux through it changes continuously, inducing a voltage that reverses sign every half rotation, producing AC.

   B. A stationary coil with a rotating capacitor causing alternating current.

   C. A coil rotated in a static electric field yields DC.

   D. A magnet moves around a stationary coil producing alternating current via rectification.

10. **Which equation expresses Ohm's Law?**

    A. V = IR

    B. P = VI

    C. E = IR

    D. Q = V / I

Answers

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

Explanations

1. **What is charge?**

   A. The rate of flow of electricity

   B. Value for electricity flowing in a circuit

   C. The opposition to current flow

   D. The pressure that pushes electricity through an electrical circuit

Charge is the amount of electric electricity carried by matter. It's a quantity, not a rate. Think of it as how much electric "stuff" has moved or is stored, and it's measured in coulombs. In circuits, the flow rate of charge is current, which tells you how many coulombs pass a point per second. The total charge that moves through a point over a period of time is Q = I × t, so saying charge is the "value" of electricity flowing captures that it's the amount, not the speed of the flow. That's why other terms represent different things: current is the rate of flow, resistance is what opposes that flow, and voltage is the pushing force that drives the flow.

2. **In terms of energy behavior, which statement about reactance is accurate?**

   A. It dissipates energy as heat in a resistor

   B. It has no effect on energy flow

   C. It converts energy into light

   D. It stores energy and releases it after a quarter cycle

Reactance comes from inductors and capacitors in AC circuits, and it reflects energy storage rather than energy loss. An ideal reactive element doesn't convert electrical energy into heat or light; instead, it temporarily stores energy in a magnetic field (inductor) or an electric field (capacitor) and then returns that energy back to the circuit as the current and voltage continue to change. In a sinusoidal drive, voltage and current are out of phase by 90 degrees, which is why energy swings between the source and the field. The stored energy peaks at certain points and is released a quarter of a cycle later, so the statement that reactance stores energy and releases it after a quarter cycle best captures its energy behavior.

3. **For maximum power transfer, how must the load resistance compare to the source resistance?**

   A. Load resistance must be zero

   B. Load resistance must be greater than the source resistance

   C. Load resistance must equal the source resistance

   D. Load resistance must be double the source resistance

Maximum power transfer occurs when the load resistance equals the source's internal resistance. Model the source as an ideal voltage source Vth in series with Rs. The power delivered to the load is P = Vth^2 · RL / (RL + Rs)^2. This expression is maximized when RL = Rs. At that point, half the voltage drops across the internal resistance and half across the load, giving I = Vth / (2Rs) and Pmax = Vth^2 / (4Rs). If the load is too small, too much power is wasted in Rs; if the load is too large, little current flows and the load power drops.

4. **In a three-phase system, the three wires carry the power with a neutral used for grounding.**

   A. Two wires

   B. Three wires with a neutral

   C. Four wires with a neutral

   D. Three wires without a neutral

Three-phase power uses three conductors that carry the three phase voltages. A neutral is not always present, but when you need to supply single-phase loads or provide a grounded reference, you include a neutral and bond it to earth. That adds a fourth conductor: three phase wires plus the neutral. So, describing a system that uses a neutral for grounding corresponds to four wires in total. If you only needed to carry the three-phase power itself without a neutral, you'd have three wires.

5. **If the resistance in a series circuit doubles, what happens to the current?**

   A. The current doubles

   B. The current remains the same

   C. The current is halved

   D. The current becomes zero

Current in a circuit with a fixed voltage is inversely related to resistance. In a series circuit, the same current flows through all components, and the total resistance is the sum of the resistances. If the total resistance doubles while the voltage stays the same, the current becomes half as large: $I_{new} = V / (2R) = (1/2) \times (V/R) = I_{old}/2$. So the current is halved. It wouldn't double or stay the same, and it wouldn't drop to zero unless the voltage or resistance changed to an extreme (infinite resistance or zero voltage).

6. **Capacitors in series have an equivalent capacitance equal to what?**

   A. The reciprocal of the sum of reciprocals

   B. The sum of their capacitances

   C. The product of the capacitances

   D. The difference of the capacitances

In a series connection, the same charge flows through every capacitor, so the charges are equal and the voltages add: $V_{total} = V1 + V2 + \ldots$. Since $Vi = Q / Ci$ for each capacitor, you get $V_{total} = Q(1/C1 + 1/C2 + \ldots)$. By definition, the equivalent capacitance relates the total charge to the total voltage as $Q = Ceq \cdot V_{total}$. Substituting gives $1/Ceq = 1/C1 + 1/C2 + \ldots$, so the equivalent capacitance is the reciprocal of the sum of reciprocals. For two capacitors, $Ceq = 1 / (1/C1 + 1/C2)$. This shows why adding more capacitors in series lowers the total capacitance. The other options don't fit because the sum of capacitances applies to parallel connections, the product isn't the correct relationship for series, and the difference has no general basis for series combinations.

7. What is a magnetic field?

A. The region around a magnet where a force acts on another magnet or on a magnetic material

B. A region where electric charges move at high speed

C. A field that stores electrical energy in capacitors

D. A region that can convert mechanical energy into heat

A magnetic field is the region around a magnet where its magnetic influence can exert a force on other magnets or on magnetic materials. This field is described by the vector B and tells you both the direction and strength of the magnetic force that would act on moving charges or on magnetic materials placed in that region. Field lines illustrate this influence, typically looping from the magnet's north pole to its south outside and closing around inside different magnetic circuits. The force on a moving charge arises from the cross product of the charge's velocity and the magnetic field, which explains why moving charges experience sideways forces and compasses deflect in a magnetic field. The other statements refer to electric charges in motion, electric energy storage in capacitors, or conversion to heat, none of which define a magnetic field.

8. If a source has no reactance, maximum power transfer occurs when the load resistance equals the source resistance.

A. True

B. False

C. Only with DC

D. Only with AC

When the source presents no reactance, its impedance is purely real, equal to the internal resistance Rs. The power delivered to a purely resistive load RL is P = Vs^2 · RL / (Rs + RL)^2. This expression is maximized when RL equals Rs. At that point, the current is Vs/(2Rs) and the load power is Vs^2/(4Rs). So the load ends up receiving as much power as is dissipated inside the source, illustrating the maximum power transfer under impedance matching. Since there's no reactance to worry about, this condition (RL = Rs) holds for both DC and AC in this scenario.

9. How does an AC generator work?

A. A simple ac generator consists of a coil rotated in a magnetic field. As the coil rotates the magnetic flux through it changes continuously, inducing a voltage that reverses sign every half rotation, producing AC.

B. A stationary coil with a rotating capacitor causing alternating current.

C. A coil rotated in a static electric field yields DC.

D. A magnet moves around a stationary coil producing alternating current via rectification.

Rotating a coil inside a magnetic field causes the magnetic flux linking the coil to change over time. By electromagnetic induction, a voltage is induced in a conductor when the magnetic flux through it varies. As the rotor turns, the angle between the coil and the field changes smoothly, so the flux follows a cyclic pattern (roughly cosine in time). The rate of flux change is highest as the coil moves away from alignment and zero when it passes through the field's axis, so the induced voltage swings in polarity and magnitude in a sinusoidal way. Because the polarity reverses every half turn, the current in the external circuit becomes alternating current. The output amplitude depends on how many turns the coil has, the magnetic field strength, the coil area, and how fast the rotor spins. In short, changing magnetic flux in a rotating coil is the mechanism that creates an alternating voltage and thus an AC supply. Other ideas don't fit because they misrepresent how induction works: a rotating capacitor doesn't drive a steady, looping current through a coil, a coil in a static field would not produce a changing flux and thus not an AC, and moving a magnet with rectification would mix generation with a conversion step that isn't how AC is produced.

10. Which equation expresses Ohm's Law?

A. V = IR

B. P = VI

C. E = IR

D. Q = V / I

Ohm's Law describes how voltage, current, and resistance relate in a conductor: the voltage across the component equals the current through it times its resistance. This is what V = IR expresses. It means the voltage is the product of how hard charges are pushed (current) and how much the component resists that flow (resistance). Knowing any two of the three lets you solve for the third—so if you know the current and resistance, you can find the voltage, or if you know the voltage and resistance, you can find the current, and so on. In practice, this relationship is what lets you see how changing one quantity affects the others. For instance, doubling the current through a fixed resistor doubles the voltage across it, and doubling the resistance with the same current doubles the voltage as well. The other expressions describe different ideas: P = VI gives power, not the basic current–voltage–resistance link; Q = V / I would mix charge with resistance and isn't a valid form of Ohm's law; E = IR is essentially a variant form if you interpret E as the voltage across the element, but standard form for Ohm's law uses V = IR.

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://elecengrfundamentalsint.examzify.com

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