

Load Calculations - Feeders and Services (26401) 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

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- 1. Which calculation considers both the branch circuits and feeders?**
 - A. Total Load Calculation**
 - B. Demand Load Calculation**
 - C. Service Load Calculation**
 - D. Active Load Calculation**

- 2. Why is it important to consider harmonics in feeder calculations?**
 - A. They may cause light flicker in residential areas**
 - B. Harmonics can lead to additional heating and losses in systems**
 - C. They increase the system's energy efficiency**
 - D. Harmonics are only an issue in renewable energy sources**

- 3. What is the rule of thumb for calculating total demand for small appliance loads in kitchens?**
 - A. A single 15-amp circuit for the kitchen**
 - B. Two 20-amp circuits for the kitchen**
 - C. One 30-amp circuit for major appliances**
 - D. Three 15-amp circuits for various loads**

- 4. What is the consequence of failing to consider life-safety operations in load calculations?**
 - A. Increased energy consumption**
 - B. Potential hazards in emergencies**
 - C. Improved operational efficiency**
 - D. No significant impact**

- 5. How do you convert kVA to kilowatts in a resistive load?**
 - A. Divide kVA by the power factor**
 - B. Multiply kVA by the power factor**
 - C. Multiply kVA by 1.5**
 - D. Add 10% to kVA**

- 6. Which factor is NOT typically considered when calculating load demand for healthcare facilities?**
- A. Equipment criticality**
 - B. Backup power requirements**
 - C. Recreational space usage**
 - D. Emergency power systems**
- 7. How should loads be grouped when calculating feeder loads?**
- A. By voltage level**
 - B. By geographic location**
 - C. By type of load**
 - D. By frequency of use**
- 8. In electrical installations, why are tap conductors significant?**
- A. They allow for easier connectivity with multiple circuits**
 - B. They offer enhanced protection for connected conductors**
 - C. They simplify the design of electrical systems**
 - D. They provide a means to expand wiring systems easily**
- 9. What is the primary role of a branch circuit?**
- A. To supply power to large equipment**
 - B. To distribute power to individual loads**
 - C. To connect service equipment to a transformer**
 - D. To manage ground faults**
- 10. What is the general purpose receptacle load calculation recommended by NEC?**
- A. 150VA per outlet**
 - B. 180VA per outlet**
 - C. 200VA per outlet**
 - D. 220VA per outlet**

Answers

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

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Explanations

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1. Which calculation considers both the branch circuits and feeders?

- A. Total Load Calculation**
- B. Demand Load Calculation**
- C. Service Load Calculation**
- D. Active Load Calculation**

The calculation that takes into account both branch circuits and feeders is the Service Load Calculation. This type of calculation is essential because it helps in determining the total electric load that will be served by the electrical service entrance. It encompasses the loads served by all the branch circuits and integrates the capacity and demands of the feeders connecting to those circuits. By understanding the Service Load Calculation, you can ensure that the electrical service is adequately sized to handle the total expected load, which includes both continuous and non-continuous loads from various circuits. This approach is crucial for ensuring safety, compliance with code requirements, and the efficient operation of the electrical system. The other options, while related to load calculations, do not encompass both branch circuits and feeders in the same way. Total Load Calculation focuses on the sum of all loads without specifically addressing their distribution through feeders. Demand Load Calculation emphasizes the anticipated maximum load that may be required, rather than detailing how that load is served. Active Load Calculation, while relevant in certain contexts, does not capture the full scope of both branch circuits and feeders. Therefore, the Service Load Calculation is the most comprehensive and appropriate method for this evaluation.

2. Why is it important to consider harmonics in feeder calculations?

- A. They may cause light flicker in residential areas**
- B. Harmonics can lead to additional heating and losses in systems**
- C. They increase the system's energy efficiency**
- D. Harmonics are only an issue in renewable energy sources**

Considering harmonics in feeder calculations is crucial because they can lead to additional heating and losses within electrical systems. Harmonics are voltage or current waveforms that deviate from the fundamental frequency, typically caused by non-linear loads such as computers, LED lighting, and variable frequency drives. When harmonics are present, they can result in increased effective current flow, leading to higher losses in conductors and transformer heating. This heating occurs because energy is dissipated as heat in the conductors due to higher frequencies that create a sort of additional resistance in the system. Moreover, excessive harmonics can also affect the performance of other equipment and reduce the lifespan of electrical components. Therefore, accounting for harmonics in calculations helps ensure that electrical systems operate efficiently, safely, and within design parameters.

3. What is the rule of thumb for calculating total demand for small appliance loads in kitchens?

- A. A single 15-amp circuit for the kitchen**
- B. Two 20-amp circuits for the kitchen**
- C. One 30-amp circuit for major appliances**
- D. Three 15-amp circuits for various loads**

The guideline for calculating total demand for small appliance loads in kitchens emphasizes the use of two 20-amp circuits. This recommendation is based on the National Electrical Code (NEC) requirements, which suggest that kitchens should have a minimum of two separate circuits to power countertop receptacles, ensuring that there is adequate capacity for multiple appliances that may be used simultaneously. Using two 20-amp circuits allows for a 16-amp load on each circuit, offering headroom to accommodate the diverse electrical needs of kitchen appliances like microwaves, toasters, and blenders. This approach not only ensures safety by minimizing the risk of circuit overloads but also enhances convenience, as it provides flexibility for appliance usage without tripping breakers. The other options, while aimed at addressing kitchen loads, do not meet the NEC recommendations as effectively. A single 15-amp circuit would not provide sufficient capacity for the range of appliances likely to be used at the same time. A 30-amp circuit is more suited for major appliances but fails to accommodate smaller loads efficiently. Lastly, three 15-amp circuits may offer more outlets but still lack the capacity and design considerations that the two 20-amp circuits accomplish for small appliance demands.

4. What is the consequence of failing to consider life-safety operations in load calculations?

- A. Increased energy consumption**
- B. Potential hazards in emergencies**
- C. Improved operational efficiency**
- D. No significant impact**

Failing to consider life-safety operations in load calculations can lead to potential hazards in emergencies. When designing electrical systems, it's essential to ensure that life-safety systems, such as emergency lighting, fire alarms, and exit signs, have sufficient power during a power failure or emergency situation. If these systems are not correctly accounted for in load calculations, they may become inoperable when most needed, resulting in an increased risk to occupants' safety and wellbeing. Proper load calculations must include the requirements of life-safety operations to guarantee that these critical systems function effectively during emergencies, ensuring a safe evacuation and minimizing risks to life. This focus on safety not only meets regulatory standards but also provides peace of mind that buildings are equipped to handle emergencies appropriately.

5. How do you convert kVA to kilowatts in a resistive load?

- A. Divide kVA by the power factor**
- B. Multiply kVA by the power factor**
- C. Multiply kVA by 1.5**
- D. Add 10% to kVA**

To convert kVA (kilovolt-amperes) to kilowatts (kW) in a resistive load, you multiply the value in kVA by the power factor. The power factor represents the efficiency of the electrical system, defining the ratio of real power (used for work) to apparent power (total power in the circuit). In a resistive load, the power factor is typically close to 1 (or 100%), because all the power supplied is effectively used to perform work, with minimal losses due to reactive components. Therefore, when converting kVA to kW in a resistive application, multiplying by the power factor provides the precise value of power being utilized by the load. For instance, if you have a resistive load rated at 10 kVA with a power factor of 1, the calculation for kilowatts would be $10 \text{ kVA} * 1 = 10 \text{ kW}$. This straightforward calculation demonstrates how the complete apparent power usage translates into effective power used by the load.

6. Which factor is NOT typically considered when calculating load demand for healthcare facilities?

- A. Equipment criticality**
- B. Backup power requirements**
- C. Recreational space usage**
- D. Emergency power systems**

In calculating load demand for healthcare facilities, factors such as equipment criticality, backup power requirements, and emergency power systems are essential. These elements ensure that the facility can operate effectively in both normal and emergency conditions, providing necessary care without interruption. Equipment criticality relates to understanding which machines and devices are vital for patient care and must always have power. Backup power requirements are crucial because healthcare facilities must have contingency plans to maintain operations during outages. Emergency power systems are directly linked to this, as they provide a fail-safe mechanism, ensuring that vital systems remain powered when the main supply is disrupted. In contrast, recreational space usage does not typically factor into load demand calculations. While recreational areas may contribute to the overall comfort and well-being of patients and staff, they do not have the same critical need for constant power as medical equipment and emergency systems. Thus, when assessing the load demand, recreational spaces are considered less significant in terms of electrical supply requirements. This distinction makes recreational space usage the option that is not central to load calculations in healthcare facilities.

7. How should loads be grouped when calculating feeder loads?

- A. By voltage level
- B. By geographic location
- C. By type of load**
- D. By frequency of use

When calculating feeder loads, grouping loads by type of load is essential for ensuring accurate and efficient load calculations. This method allows for a better understanding of the characteristics and behaviors of different electrical loads, such as resistive, inductive, or capacitive loads, and how they may interact with one another. For instance, resistive loads (like heaters) have different power factor considerations compared to inductive loads (like motors). By grouping them appropriately, the calculations can more accurately reflect the total electrical demand, ensuring that the feeder is adequately designed to handle the combined effects of the varied types of loads without over or underestimating the necessary capacity. This grouping approach also assists in identifying how different loads might influence each other's performance, which is vital for maintaining efficiency and safety in electrical systems. The other options, while they may have their own merits in different contexts, do not provide the same level of detail and understanding that comes from grouping loads by type. Grouping by voltage level might disregard important load characteristics, geographic location may not relate directly to electrical demand, and grouping by frequency of use does not address load types' inherent electrical properties. Therefore, focusing on the type of load offers the most practical and beneficial framework for calculating feeder loads.

8. In electrical installations, why are tap conductors significant?

- A. They allow for easier connectivity with multiple circuits
- B. They offer enhanced protection for connected conductors**
- C. They simplify the design of electrical systems
- D. They provide a means to expand wiring systems easily

Tap conductors are significant primarily because they facilitate connections to a larger conductor system while allowing the smaller taps to draw from the larger source. The enhanced protection for connected conductors is vital because tap conductors must be adequately sized and protected under electrical codes. This ensures that they can handle the load effectively without overheating or posing safety hazards. Well-designed tap conductors will typically have overcurrent protection that also covers the conductors that they serve. This means that should a fault occur, the protection mechanism will help ensure that the tap conductors are safeguarded against potential overloads or shorts that could cause damage or electrical failure. By ensuring the integrity of the system through protection, tap conductors contribute to the overall safety and reliability of electrical installations. While the ability to expand wiring systems, make connectivity easier, and simplify designs can also be factors in using tap conductors, these aspects are secondary to the primary need for protection, which is a foundational aspect of any electrical system's safety protocols.

9. What is the primary role of a branch circuit?

- A. To supply power to large equipment
- B. To distribute power to individual loads**
- C. To connect service equipment to a transformer
- D. To manage ground faults

The primary role of a branch circuit is to distribute power to individual loads. This is essential in electrical systems as branch circuits are responsible for providing the necessary voltage and current to various devices, fixtures, and appliances within a building or facility. Branch circuits serve as the final part of the electrical distribution system, coming off the main distribution panel or subpanel. They connect directly to outlets, lighting fixtures, and other electrical equipment, ensuring that each load receives power according to its specific requirements. This distribution ensures that each electrical load is adequately supplied while maintaining safety and efficiency throughout the electrical system. Other functions, such as supplying large equipment or connecting service equipment to transformers, typically fall under the responsibilities of feeders or main service conductors, which manage the larger power flow before it is divided into smaller circuits. Ground fault management, while important for safety, is not the primary role of a branch circuit but rather a protective feature that can be incorporated into the design of branch circuits or the devices connected to them.

10. What is the general purpose receptacle load calculation recommended by NEC?

- A. 150VA per outlet
- B. 180VA per outlet**
- C. 200VA per outlet
- D. 220VA per outlet

The National Electrical Code (NEC) recommends a general-purpose receptacle load calculation of 180 volts-amperes (VA) per outlet for dwelling units. This figure is established to ensure that residential electrical systems are adequately designed to handle the expected load from general-purpose outlets, which can be used for a variety of devices such as lamps, appliances, and electronics. Using 180 VA per outlet provides a conservative estimate that allows for diversity in load usage, meaning that not every outlet will be used at full capacity at the same time. This approach ensures safety and efficiency in electrical design and helps prevent overloading circuits. In the context of the other options, the reasons for their inaccuracy relate to the NEC's established standards, as a figure higher than 180 VA could lead to oversizing of the electrical system, resulting in unnecessary costs in materials and installation. Conversely, a number lower than 180 VA may not provide sufficient capacity for expected demands, potentially leading to circuit failure or safety hazards. Thus, 180 VA aligns well with the NEC's intention to balance safety, reliability, and cost.

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://loadcalcfeedersservices.examzify.com>

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

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