

Illinois Fire Apparatus Engineer (FAE) Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

This is a sample study guide. To access the full version with hundreds of 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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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!

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Questions

- 1. What is indicated when the Friction Loss reaches approximately 36 psi/100 feet of hose?**
 - A. Red Line**
 - B. Green Zone**
 - C. Safe Operating Range**
 - D. Hazardous Level**
- 2. What type of water is termed as Domestic Supply?**
 - A. Water used solely for fire protection**
 - B. Water required for residential and commercial use**
 - C. Water that is only distributed in public utilities**
 - D. Water mainly collected for industrial consumption**
- 3. What is the NFPA standard relating to fire apparatus design?**
 - A. NFPA 1500**
 - B. NFPA 1901**
 - C. NFPA 101**
 - D. NFPA 75**
- 4. What is the primary function of a volute in fire apparatus?**
 - A. Increases engine power output**
 - B. Prevents water from swirling around the impeller**
 - C. Regulates pump discharge pressure**
 - D. Flashes hydrants**
- 5. What is a characteristic of a relief valve?**
 - A. Can be used only at high pressures**
 - B. Not capable of compensating for a decrease in pressure**
 - C. Works best at low draft conditions**
 - D. Only functional with diesel engines**

- 6. At what level of friction loss is the "Red Line" considered reached?**
- A. 20 psi per 100 feet**
 - B. 30 psi per 100 feet**
 - C. 36 psi per 100 feet**
 - D. 50 psi per 100 feet**
- 7. What distinguishes a medium duty fire engine from a heavy duty fire engine?**
- A. A medium duty has higher horsepower**
 - B. A medium duty has lower water capacity**
 - C. A medium duty has more specialized equipment**
 - D. A medium duty is lighter for easier maneuverability**
- 8. What benefit is associated with having an updated inventory of fire apparatus equipment?**
- A. It prevents budget overruns**
 - B. It allows for better community engagement**
 - C. It facilitates quicker access to required tools**
 - D. It ensures compliance with environmental regulations**
- 9. What is a typical weight for a firefighter's personal protective equipment (PPE) when on fire apparatus?**
- A. 30-40 pounds**
 - B. 60-80 pounds**
 - C. 100-120 pounds**
 - D. 120-150 pounds**
- 10. How does tire maintenance directly impact the fire apparatus?**
- A. It ensures optimal handling and safety during responses**
 - B. It affects the fuel efficiency of the vehicle**
 - C. It only influences the visual presentation of the apparatus**
 - D. It has no significant impact on operational performance**

Answers

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

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Explanations

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1. What is indicated when the Friction Loss reaches approximately 36 psi/100 feet of hose?

- A. Red Line**
- B. Green Zone**
- C. Safe Operating Range**
- D. Hazardous Level**

When friction loss reaches approximately 36 psi per 100 feet of hose, it indicates a threshold known as the Red Line. This level signals that the friction loss is significant enough to potentially compromise the effectiveness of water delivery, requiring increased attention and likely adjustments to the flow or pressure being used. In firefighting, understanding friction loss is crucial as it affects the actual pressure at the nozzle and subsequently the reach and effectiveness of the water stream. When encountering friction losses of this magnitude, fire engineers need to ensure that they have sufficient pressure being supplied by the pump to maintain adequate flow rates for effective firefighting operations. The other options represent different contexts and safety thresholds. The Green Zone generally indicates safe operational parameters, while the Safe Operating Range also encompasses conditions where the system can function without risks. Hazardous Levels would refer to situations where safety could be significantly compromised, which may not specifically correlate to the indicated friction loss of 36 psi. Understanding these distinctions helps ensure safe and effective firefighting strategies.

2. What type of water is termed as Domestic Supply?

- A. Water used solely for fire protection**
- B. Water required for residential and commercial use**
- C. Water that is only distributed in public utilities**
- D. Water mainly collected for industrial consumption**

Domestic supply refers to the water that is necessary for the typical needs of households and businesses. This includes not only drinking water but also water used for cooking, bathing, cleaning, and other essential daily activities. The term encompasses a broad range of uses that a residential or commercial establishment would require, signifying its crucial role in supporting the health and hygiene of the community. In the context of the provided options, the focus on residential and commercial use aligned with the definition is what makes this answer accurate. While the needs for fire protection are important, they do not encapsulate the wider variety of uses encompassed by domestic supply. Similarly, water distributed solely through public utilities or intended for industrial purposes does not align with the broader definition of domestic supply, which is fundamentally about meeting the everyday needs of the population. Hence, defining it as water required for residential and commercial use captures the essence of what domestic supply entails.

3. What is the NFPA standard relating to fire apparatus design?

A. NFPA 1500

B. NFPA 1901

C. NFPA 101

D. NFPA 75

The correct answer is NFPA 1901, which specifically addresses the standard for the design and construction of fire apparatus. This standard establishes the minimum requirements for the construction and performance of fire apparatus, ensuring that vehicles are equipped for safety, operational efficiency, and effectiveness in emergency response. NFPA 1901 includes detailed guidelines on vehicle stability, braking performance, equipment mounting, and fire pump specifications, all crucial for ensuring that firefighting operations can be executed safely and effectively. In contrast, NFPA 1500 focuses on occupational safety and health standards for fire departments, while NFPA 101 pertains to life safety from fire in buildings and structures. NFPA 75 addresses the protection of information technology equipment. While these standards are important in their respective domains, they do not specifically focus on the design and requirements for fire apparatus like NFPA 1901 does.

4. What is the primary function of a volute in fire apparatus?

A. Increases engine power output

B. Prevents water from swirling around the impeller

C. Regulates pump discharge pressure

D. Flashes hydrants

The primary function of a volute in fire apparatus is to prevent water from swirling around the impeller. The volute is a spiral-shaped chamber that directs the flow of water efficiently from the impeller to the discharge. By designing the water flow path in this manner, the volute helps to convert the kinetic energy imparted by the impeller into pressure energy, which is critical for effective firefighting operations. This streamlined flow prevents eddies and turbulence that can reduce pump efficiency and performance. Understanding the role of the volute is essential for fire apparatus engineers, as maintaining optimal pump performance is vital for ensuring adequate water supply and pressure during firefighting activities.

5. What is a characteristic of a relief valve?

- A. Can be used only at high pressures**
- B. Not capable of compensating for a decrease in pressure**
- C. Works best at low draft conditions**
- D. Only functional with diesel engines**

A relief valve is designed to maintain safe operating pressures in a system by automatically releasing excess pressure. One of its key characteristics is that it functions without adjusting for decreasing pressure; rather, it responds primarily to exceedances of set pressure levels. This means the valve opens when pressure exceeds a predetermined limit to allow fluid to escape, preventing potential damage or failure in the system. In contrast, a relief valve does not actively compensate for pressure drops. Instead, its role is reactive, maintaining pressure balance by releasing fluid when necessary, rather than adjusting to varying conditions within the system. The other options mischaracterize the functionality and application of relief valves. Relief valves are not limited to high pressure scenarios, can work effectively across varying draft conditions, and are not restricted to use with diesel engines, making the selected answer the most accurate representation of a relief valve's characteristics.

6. At what level of friction loss is the "Red Line" considered reached?

- A. 20 psi per 100 feet**
- B. 30 psi per 100 feet**
- C. 36 psi per 100 feet**
- D. 50 psi per 100 feet**

The "Red Line" being reached refers to an established threshold in firefighting operations, particularly concerning hose and friction loss. When friction loss reaches 36 psi per 100 feet, it serves as a critical indicator of the effectiveness of the hose layout and the pressure required to deliver water effectively to the fire scene. This level of friction loss is significant because it usually indicates that the system may struggle to maintain adequate pressure for effective firefighting operations. Operations can become less efficient, and firefighters may experience challenges in maintaining water supply pressures as this level is approached. The 36 psi per 100 feet benchmark helps firefighters and engineers assess their current operational capabilities and make necessary adjustments when deploying hoses. Understanding this threshold allows crews to strategize effectively, ensuring that they do not exceed friction loss levels that could compromise water delivery. Recognizing the implications of exceeding this red line is crucial for maintaining safety and operational success in firefighting missions.

7. What distinguishes a medium duty fire engine from a heavy duty fire engine?

- A. A medium duty has higher horsepower**
- B. A medium duty has lower water capacity**
- C. A medium duty has more specialized equipment**
- D. A medium duty is lighter for easier maneuverability**

A medium duty fire engine is characterized by its lower water-carrying capacity compared to a heavy duty fire engine. Heavy duty fire engines are typically built with larger tanks to hold more water, enabling them to tackle larger fires or situations requiring a sustained water supply. This distinction in water capacity reflects the intended use of these vehicles; medium duty units are often designed for urban or suburban environments where the density of fire hydrants allows for more strategic water usage, while heavy duty units are utilized in rural areas or large-scale incidents where a greater amount of water is essential. The differences in design philosophies also contribute to the overall structure and performance of these trucks, where medium duty engines might be optimized for agility and quick response, rather than maximum capacity.

8. What benefit is associated with having an updated inventory of fire apparatus equipment?

- A. It prevents budget overruns**
- B. It allows for better community engagement**
- C. It facilitates quicker access to required tools**
- D. It ensures compliance with environmental regulations**

Having an updated inventory of fire apparatus equipment facilitates quicker access to required tools, which is crucial in emergency situations. When firefighters respond to calls, the efficiency and speed of their operations can significantly impact outcomes. An accurate inventory ensures that personnel know exactly what equipment is available, its location, and its condition. This readiness allows for faster deployment of the right tools and equipment, thereby enhancing response times and improving overall effectiveness during incidents. Being well-aware of the inventory means that responders can quickly locate and utilize necessary equipment without delay. This is especially important in high-pressure scenarios where every second counts. Moreover, regular updates to the inventory help maintain equipment in proper working order, further supporting efficient operations. While other factors, like budget management, community relations, and compliance with regulations are important, the immediate operational benefits of having a precise inventory directly influence response capabilities and, consequently, the effectiveness of fire and rescue missions.

9. What is a typical weight for a firefighter's personal protective equipment (PPE) when on fire apparatus?

- A. 30-40 pounds**
- B. 60-80 pounds**
- C. 100-120 pounds**
- D. 120-150 pounds**

The weight of a firefighter's personal protective equipment (PPE) when on fire apparatus can typically range between 60-80 pounds. This weight includes essential gear such as protective clothing, helmets, boots, gloves, and self-contained breathing apparatus (SCBA). The design and materials used in modern PPE are intended to provide maximum protection while still being manageable for the firefighter. The weight considers not only the bulkiness of the gear but also the need for firefighters to move freely and effectively perform their duties in emergency situations. While some options reflect heavier weights, the standard range of 60-80 pounds aligns with current industry practices, ensuring that firefighters can operate efficiently without being overly encumbered by their gear. Therefore, understanding the correct weight range for PPE is crucial for both safety and effectiveness in emergency response operations.

10. How does tire maintenance directly impact the fire apparatus?

- A. It ensures optimal handling and safety during responses**
- B. It affects the fuel efficiency of the vehicle**
- C. It only influences the visual presentation of the apparatus**
- D. It has no significant impact on operational performance**

Tire maintenance is crucial for fire apparatus because it plays a key role in ensuring optimal handling and safety during emergency responses. Properly maintained tires enhance the vehicle's grip on the road, allowing for responsive steering and stability, especially during high-speed maneuvers or in adverse conditions. In the context of firefighting, where every second counts, having tires with the right pressure, tread depth, and overall condition is essential for maintaining control of the apparatus when responding to incidents. Good tire maintenance also contributes to the safe transport of personnel and equipment, minimizing the risk of accidents or challenges during critical moments. This focus on safety and performance ensures that firefighters can reach emergency scenes quickly and effectively, making it a top priority in the maintenance schedule for fire apparatus.

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://ilfireapparatusengr.examzify.com>

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