

UNITED STATES AIR FORCE ACADEMY (USafa) CONTRAILS PRACTICE EXAM (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

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- 1. What fundamental physics concept essential to aerospace is commonly tested at the basic level?**
 - A. Newton's Laws of Motion
 - B. Conservation of Energy
 - C. Quantum Mechanics
 - D. Thermodynamics
- 2. Which metric is commonly used to describe cadet physical fitness?**
 - A. A composite score from push-ups, sit-ups, and running time (APFT-style).
 - B. A single-mile run time only.
 - C. Number of sit-ups alone.
 - D. Body mass index only.
- 3. Major, one gold oak leaf corresponds to which officer grade?**
 - A. Air Force O-5
 - B. Air Force O-6
 - C. Air Force O-3
 - D. Air Force O-4
- 4. Which role is Major Monica Mason known for?**
 - A. Squadron Air Officer Commanding
 - B. Group Air Officer Commanding
 - C. Director of Athletics
 - D. Chief of Space Operations
- 5. Secretary of Defense**
 - A. The Honorable Frank Kendall III
 - B. The Honorable Joseph R. Biden Jr.
 - C. The Honorable Lloyd J. Austin III
 - D. The Honorable James Mattis
- 6. The Gulfstream V (C-37A) is assigned to which mission?**
 - A. Passenger Airlift
 - B. Special Air Missions
 - C. Theater Tactical Airlift
 - D. Airborne Battle Management

- 7. Which line completes the Star Spangled Banner II excerpt: 'O'er the land of the free and the home of the brave'?**
- A. O'er the land of the free and the home of the brave.
 - B. The star-spangled banner in triumph doth wave O'er the land of the free and the home of the brave.
 - C. And this be our motto: 'In God is our trust.'
 - D. Long may it wave over the land of the free.
- 8. Space-Based Infrared System (SBIRS) is primarily used for which function?**
- A. Missile Warning
 - B. Meteorology
 - C. Space Surveillance
 - D. Communications (Protected SATCOM)
- 9. Cobra Dane belongs to which category?**
- A. Space Awareness/Object Tracking
 - B. Spacelift
 - C. Missile Warning
 - D. Communications
- 10. Which rank uses four silver stars?**
- A. Lieutenant General
 - B. General
 - C. General of the Army
 - D. General of the Air Force

Answers

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

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Explanations

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1. What fundamental physics concept essential to aerospace is commonly tested at the basic level?

- A. Newton's Laws of Motion**
- B. Conservation of Energy
- C. Quantum Mechanics
- D. Thermodynamics

Newton's Laws of Motion govern how objects move in response to forces, and this directly translates to how an aircraft flies. In steady, level flight the lift generated by the wings balances the aircraft's weight, and the thrust from the engines balances drag, so there's no net force and the plane maintains a constant velocity. When taking off or climbing, thrust and/or lift exceed weight and/or drag, producing acceleration in the appropriate direction. The second law, $F = ma$, links those forces to acceleration: increasing thrust makes the aircraft accelerate forward, while increasing lift changes the vertical acceleration. The third law explains propulsion and wing aerodynamics in a tangible way: engines push exhaust backward to push the airplane forward, and the wing creates lift through pressure differences between the upper and lower surfaces. This framework is the most direct, universal way to predict and control motion in aerospace, which is why it's routinely tested at the basic level. Other topics like energy considerations and thermodynamics matter for efficiency and engine performance, but the everyday behavior of moving through air comes from applying Newton's laws.

2. Which metric is commonly used to describe cadet physical fitness?

- A. A composite score from push-ups, sit-ups, and running time (APFT-style).**
- B. A single-mile run time only.
- C. Number of sit-ups alone.
- D. Body mass index only.

Fitness is best described by a measure that reflects multiple aspects, not just one. An APFT-style composite score combines performance in push-ups, sit-ups, and a running event into a single number, which captures upper-body strength, core endurance, and cardiovascular fitness. This gives a fuller picture of overall readiness and allows for meaningful comparisons across cadets and over time. Relying on a single metric like a mile run only misses strength and core endurance; counting sit-ups alone ignores cardio and overall endurance; BMI alone doesn't reflect actual physical performance. That combination in one score is why it's the standard way to describe cadet physical fitness.

3. Major, one gold oak leaf corresponds to which officer grade?

- A. Air Force O-5
- B. Air Force O-6
- C. Air Force O-3
- D. Air Force O-4**

Understanding officer insignia is the key. In the Air Force, the shape and color on an officer's shoulder indicate rank. A gold oak leaf is used for the rank of Major, which corresponds to pay grade O-4. This symbol sets Major apart from other tiers: a Captain (O-3) wears two connected bars; a First Lieutenant (O-2) wears a silver bar; a Second Lieutenant (O-1) wears a gold bar; a Lieutenant Colonel (O-5) uses a silver oak leaf; and a Colonel (O-6) uses an eagle. So the presence of a single gold oak leaf identifies Major, i.e., O-4.

4. Which role is Major Monica Mason known for?

- A. Squadron Air Officer Commanding
- B. Group Air Officer Commanding
- C. Director of Athletics
- D. Chief of Space Operations

A Squadron Air Officer Commanding is the officer in charge of a cadet squadron at the United States Air Force Academy, responsible for leading training, setting standards, and ensuring the welfare and readiness of the cadets within that squadron. Major Monica Mason is known for holding that squadron-level leadership role, guiding a specific group of cadets and shaping their development through day-to-day supervision, mentorship, and oversight of operations. The other roles involve responsibilities at different levels or in unrelated areas—group-level leadership overseeing multiple squadrons, a director of athletics overseeing athletic programs, or the Chief of Space Operations, which is the top leader of the Space Force. Thus, the squadron-level AOC best fits the role associated with Major Mason.

5. Secretary of Defense

- A. The Honorable Frank Kendall III
- B. The Honorable Joseph R. Biden Jr.
- C. The Honorable Lloyd J. Austin III
- D. The Honorable James Mattis

The position of Secretary of Defense is the head of the Department of Defense and a cabinet-level appointee who leads the nation's military policy and forces, appointed by the President and confirmed by the Senate. In this lineup, the person serving in that role is Lloyd J. Austin III, a retired four-star Army General who previously commanded U.S. Central Command and has been serving as Secretary since 2021. He was selected by President Joe Biden and confirmed to lead the department in that year. The other names are not the Defense Secretary: one is the President, another is the Secretary of the Air Force, and one is a former Defense Secretary from a prior administration.

6. The Gulfstream V (C-37A) is assigned to which mission?

- A. Passenger Airlift
- B. Special Air Missions
- C. Theater Tactical Airlift
- D. Airborne Battle Management

Special Air Missions are the mission category for moving senior U.S. leaders and other designated government officials on official travel. The Gulfstream V (C-37A) is a VIP transport aircraft designed for long-range, secure, and comfortable official flights, with the capability to support high-level personnel and their staff. This pairing—VIP, official transport with reliable range and onboard communications—fits the Special Air Missions role best. Other mission types describe different functions: theater tactical airlift handles moving troops and equipment within a combat theater, airborne battle management refers to aircraft serving as an air command post, and a general passenger airlift covers routine civilian passenger transport rather than official government missions.

7. Which line completes the Star Spangled Banner II excerpt: 'O'er the land of the free and the home of the brave'?

A. O'er the land of the free and the home of the brave.

B. The star-spangled banner in triumph doth wave O'er the land of the free and the home of the brave.

C. And this be our motto: 'In God is our trust.'

D. Long may it wave over the land of the free.

That line is the concluding line of the Star-Spangled Banner's first verse. In the standard lyrics, after the line that asks whether that star-spangled banner yet waves, the verse ends with the exact same phrase: "O'er the land of the free and the home of the brave." So the natural completion is to repeat that line exactly as it appears, matching the song's cadence and closing the verse. The other options either come earlier in the verse, present phrases not part of the lyric, or are motto-like phrases unrelated to the anthem.

8. Space-Based Infrared System (SBIRS) is primarily used for which function?

A. Missile Warning

B. Meteorology

C. Space Surveillance

D. Communications (Protected SATCOM)

SBIRS is built around infrared sensing to detect the heat signatures of ballistic missile launches. The bright plume from a rocket stands out against the cooler background, so these sensors can spot launches quickly and provide timely, globally-wide warning to decision-makers and defenses. While the system can contribute data that support other missions, its primary mission is to deliver early warning of missile launches. Meteorology and space surveillance are handled by other systems, and SBIRS is not primarily a communications system.

9. Cobra Dane belongs to which category?

A. Space Awareness/Object Tracking

B. Spacelift

C. Missile Warning

D. Communications

Missile Warning focuses on detecting and tracking ballistic missile launches and giving timely alerts to decision-makers. Cobra Dane is a ground-based radar designed to monitor for ballistic missiles and provide tracking data to the warning network, enabling rapid notification of a launch. It's not used for tracking satellites or space debris, supporting spacelift operations, or handling communications, which is why it belongs in the Missile Warning category.

10. Which rank uses four silver stars?

- A. Lieutenant General
- B. General**
- C. General of the Army
- D. General of the Air Force

Four silver stars on an officer's insignia indicate the four-star general rank. This is the highest regular officer rank in the Air Force today. The five-star ranks—General of the Army and General of the Air Force—existed in the past and would show five stars, not four. Lower ranks use fewer stars: one star for Brigadier General, two for Major General, and three for Lieutenant General. So four stars correspond to the rank of General.

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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://usafacontrails.examzify.com>

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

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