

MTSU AEROSPACE PRACTICE TEST (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. Which equation represents the moment in weight and balance calculations?
 - A. Moment divided by Weight
 - B. Weight x Arm = Moment
 - C. Weight + Arm = Moment
 - D. Moment - Weight = Arm
2. What is the primary applicability of the 100-hour inspection?
 - A. Only used for hire
 - B. Required for all aircraft every 100 hours
 - C. For private operation only
 - D. Optional for hire aircraft
3. What type of stress acts parallel to the surface?
 - A. Shear
 - B. Tension
 - C. Compression
 - D. Bending
4. Which factor is used to obtain the actual track after converting to true course?
 - A. Wind.
 - B. Altitude.
 - C. Temperature.
 - D. Humidity.
5. Which of the following is NOT a parasite drag type?
 - A. Form drag
 - B. Induced drag
 - C. Interference drag
 - D. Skin friction drag

6. How do pilots convert magnetic course to true course for navigation, and what additional factor is applied to obtain the track?

- A. True course equals Magnetic course + variation; adjust for wind to derive track.
- B. True course equals Magnetic course minus variation; wind ignored.
- C. True course is Magnetic course only; wind is the only factor.
- D. True course is unrelated to magnetic course.

7. Which propeller type uses a governor to maintain RPM?

- A. Fixed Pitch Propeller
- B. Variable Pitch Propeller
- C. Constant Speed Propeller
- D. Feathered Propeller

8. What does TFSC stand for?

- A. Thrust-specific fuel consumption – fuel used per hour
- B. Fuel consumption per unit of thrust per hour
- C. Thrust specific fuel consumption - fuel used per unit of thrust per hour
- D. Specific fuel consumption per hour per engine

9. What is the critical angle of attack?

- A. The angle of zero lift
- B. The angle at which a wing stalls
- C. The angle of maximum lift
- D. The angle at which drag is minimized

10. In Class A airspace, which flight rules apply?

- A. VFR is permitted with standard weather minimums.
- B. Class A permits both IFR and VFR with proper clearance.
- C. In Class A, two-way radio communications are optional.
- D. In Class A airspace, IFR only.

Answers

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

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Explanations

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1. Which equation represents the moment in weight and balance calculations?

- A. Moment divided by Weight
- B. Weight x Arm = Moment**
- C. Weight + Arm = Moment
- D. Moment - Weight = Arm

Moment is the turning effect produced by a weight located at a certain distance from a reference point. In weight and balance, you determine this turning effect by multiplying the weight (in pounds) by its arm (the distance in feet from the chosen datum). The product, measured in pound-feet, represents the moment. That's why the equation $\text{Weight} \times \text{Arm} = \text{Moment}$ is the correct representation. The other forms don't reflect how moments are formed: dividing moment by weight would give the arm, adding weight and arm isn't a valid way to compute a turning effect, and subtracting weight from a moment isn't how moments are used in balance calculations. In practice, you compute each item's moment this way and sum them to get the total moment, then divide by the total weight to find the center of gravity.

2. What is the primary applicability of the 100-hour inspection?

- A. Only used for hire**
- B. Required for all aircraft every 100 hours
- C. For private operation only
- D. Optional for hire aircraft

The main idea is that the 100-hour inspection is a maintenance interval tied to aircraft used for hire. It is required for airplanes that carry people or property for compensation, or that are used for flight instruction for hire. Because of that, private operations under Part 91 aren't governed by a mandatory 100-hour schedule—their routine checks follow the annual inspection instead. So, describing the 100-hour inspection as primarily applicable to aircraft used for hire accurately captures its purpose. It isn't a universal requirement for all aircraft, it isn't limited to private operations, and it isn't optional for airplanes used for hire.

3. What type of stress acts parallel to the surface?

- A. Shear**
- B. Tension
- C. Compression
- D. Bending

Stress that acts parallel to a surface is called shear stress. It happens when forces try to slide one portion of the material past another along the plane of the surface, causing layers to shear past each other and change the angle between them. This is different from tension or compression, which act normal to the surface and pull or push along the surface's perpendicular direction. In bending, the primary effect is normal stress across the cross-section (tension on one side, compression on the other), though shear can also occur, the characteristic parallel-to-surface action is the hallmark of shear stress.

4. Which factor is used to obtain the actual track after converting to true course?

- A. Wind.**
- B. Altitude.
- C. Temperature.
- D. Humidity.

Actual track is the path you actually fly over the ground. Once you convert a course to true course, the thing that shifts that path is wind. The air moves relative to the ground, so a wind blowing across your intended route pushes your aircraft sideways, creating drift. The wind's speed and direction determine how much drift you get, and thus what the true ground track ends up being. Temperature, altitude, and humidity affect air density and performance, but they don't change the ground path as directly as wind does. To obtain the actual track, you account for wind by estimating the drift it causes and adjusting your heading accordingly.

5. Which of the following is NOT a parasite drag type?

- A. Form drag
- B. Induced drag**
- C. Interference drag
- D. Skin friction drag

Drag is split into parasite drag and induced drag. Parasite drag includes form drag, which comes from the shape and pressure distribution around the aircraft; skin friction drag, due to viscous shear on the surfaces; and interference drag, from the disruption of flow where components meet. Induced drag is different because it arises from the wing producing lift. The lift creates wingtip vortices and a downwash that costs energy, showing up as drag even though it isn't caused by surface friction or pressure on the airframe. Because it's not tied to the airframe's surface interactions like the other three, induced drag is not a parasite drag type.

6. How do pilots convert magnetic course to true course for navigation, and what additional factor is applied to obtain the track?

- A. True course equals Magnetic course + variation; adjust for wind to derive track.**
- B. True course equals Magnetic course minus variation; wind ignored.
- C. True course is Magnetic course only; wind is the only factor.
- D. True course is unrelated to magnetic course.

Converting magnetic course to true course uses variation. Magnetic course is relative to magnetic north, while charts use true north, so you add the variation (east variation adds, west subtracts) to get the true course. Once you have that true course, wind affects your path, pushing you off line. To stay on the intended route, you apply a wind correction, which adjusts your heading so the resulting path over the ground—the track—aligns with the true course. In other words, you take the true course and factor in wind to obtain the track.

7. Which propeller type uses a governor to maintain RPM?

- A. Fixed Pitch Propeller
- B. Variable Pitch Propeller
- C. Constant Speed Propeller**
- D. Feathered Propeller

A propeller that uses a governor to hold RPM is designed to keep the engine at a chosen speed by automatically adjusting blade angle. In a constant speed propeller, a governor senses the propeller RPM and changes the pitch of the blades to maintain that set RPM. If the load on the engine increases and RPM would drop, the governor moves the blades to a finer pitch to reduce drag and let RPM rise back toward the target. If RPM tends to climb, the blades move to a coarser pitch to increase drag and slow the engine back down. This automatic pitch adjustment keeps engine speed steady, which is why this type is described as constant speed. Fixed pitch propellers have a single blade angle and cannot automatically adjust to changes in load, so their RPM varies. A variable pitch propeller can change blade angle, but without the governor's automatic control, it wouldn't reliably hold RPM at a chosen setting. A feathered propeller is a high-pitch state used to reduce drag, typically in an engine-out condition, and isn't the mechanism chosen to maintain constant RPM.

8. What does TFSC stand for?

- A. Thrust-specific fuel consumption – fuel used per hour
- B. Fuel consumption per unit of thrust per hour
- C. Thrust specific fuel consumption - fuel used per unit of thrust per hour**
- D. Specific fuel consumption per hour per engine

TFSC stands for Thrust Specific Fuel Consumption. This metric shows how much fuel an engine uses to produce a set amount of thrust over a period of time. Put simply, it's the fuel flow divided by the thrust, usually expressed as weight of fuel per hour per unit of thrust (for example lb/(hr-lbf) or kg/(h-kN)). A lower TSFC means the engine is more efficient because it delivers the same thrust with less fuel. The description that defines it as fuel used per unit of thrust per hour captures both the per-hour and per-thrust aspects. The other phrasings either omit the thrust factor or misstate the scope, so they're less accurate.

9. What is the critical angle of attack?

- A. The angle of zero lift
- B. The angle at which a wing stalls**
- C. The angle of maximum lift
- D. The angle at which drag is minimized

The critical angle of attack is the angle of attack at which the airflow over the wing can no longer remain attached, causing the boundary layer to separate and the wing to stall. As the wing tilts to higher angles, lift increases up to this point, but beyond it the flow detaches from the surface, dramatically reducing lift and increasing drag. This stall onset angle depends on the airfoil shape and flight conditions, so it's the specific angle where lift no longer continues to rise with angle and stall occurs. It's not the zero-lift angle, which is where lift becomes zero, nor the angle of maximum lift (that occurs just before stall and is slightly lower than the critical angle). It's also not the angle where drag is minimized, since the lowest drag-to-lift ratio happens at a different point along the lift-drag curve. In short, the critical angle of attack marks the onset of stall.

10. In Class A airspace, which flight rules apply?

- A. VFR is permitted with standard weather minimums.
- B. Class A permits both IFR and VFR with proper clearance.
- C. In Class A, two-way radio communications are optional.
- D. In Class A airspace, IFR only.**

In Class A airspace, only IFR operations are allowed. This space is designed for high-altitude, instrument-based flight where ATC provides separation for all traffic, so pilots must be on an IFR flight plan and receive explicit ATC clearance before entering. VFR flights are not permitted there, regardless of weather, and two-way radio communications with ATC are required at all times. Aircraft entering Class A must be IFR-equipped and meet the IFR requirements, including an active IFR flight plan and a functioning transponder with altitude encoding. So, the description of IFR only is the correct one because it captures the essential rule: VFR operations are not allowed, and all flights must be conducted under IFR with ATC clearance and proper communication.

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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://mtsuaerospace.examzify.com>

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

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