

PHILSCA AIRCRAFT CONSTRUCTION, REPAIR, AND MAINTENANCE (ACRM) PRACTICE EXAM (SAMPLE)

STUDY GUIDE



Prepare with structure. Pass with confidence



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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	16

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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 metal heat-treating process creates a hard, wear-resistant surface?**
 - A. Normalizing
 - B. Annealing
 - C. Tempering
 - D. Case Hardening
- 2. Identify a common type of aircraft engine.**
 - A. Piston engine
 - B. Turbojet engine
 - C. Turbofan engine
 - D. Ramjet engine
- 3. What is the term for lifting or flaking of metal due to corrosion residual product buildup?**
 - A. Granulation
 - B. Fretting
 - C. Galling
 - D. Exfoliation
- 4. Where can technical descriptions of a certificated propeller be located?**
 - A. Applicable Airworthiness Directives
 - B. Propeller Type Certificate Data Sheets
 - C. Aircraft Specifications
 - D. Supplemental Type Certificate
- 5. In forward horizontal flight, how does the angle of attack of the advancing rotor blade compare to the retreating blade?**
 - A. More than the retreating blade
 - B. Equal to the retreating blade
 - C. Less than the retreating blade
 - D. Always greater than the retreating blade

- 6. What is the recommended method for removing corrosion from magnesium parts?**
- A. Steel wire brushes
 - B. High-grit carbon paper
 - C. Fine-grit Aluminum oxide
 - D. Stiff, nonmetallic brush
- 7. What is the maximum permissible grain deviation in wood used for aircraft?**
- A. 1:20
 - B. 1:15
 - C. 1:5
 - D. 1:7
- 8. What heat-treating operation chemically changes the surface of the metal by introducing a high carbide or nitride content?**
- A. Tempering
 - B. Carburizing
 - C. Normalizing
 - D. Case hardening
- 9. Which tool measures clearance between a surface plate and a narrow surface being checked for flatness?**
- A. Depth gauge
 - B. Dial indicator
 - C. Caliper
 - D. Thickness gauge
- 10. What does MS20 mean in the context of a rivet?**
- A. Metric System measurements is used
 - B. Malleable Steel rivet
 - C. Military Science
 - D. Military Standard

Answers

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

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Explanations

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1. Which metal heat-treating process creates a hard, wear-resistant surface?

- A. Normalizing
- B. Annealing
- C. Tempering
- D. Case Hardening**

The process that creates a hard, wear-resistant surface on metal is case hardening. This technique involves altering the surface layer of a material—usually steel—by infusing it with carbon or nitrogen at high temperatures. As a result, the outer surface develops increased hardness and wear resistance, while maintaining a tougher, more ductile core. This combination is ideal for components that experience high surface wear, such as gears and other machinery parts. Normalizing, annealing, and tempering are all heat-treating processes that modify the properties of metals, but they primarily focus on improving internal characteristics such as toughness, ductility, or relieving internal stresses rather than enhancing surface hardness. For instance, normalizing refines the grain structure for improved toughness, annealing softens materials to improve machinability, and tempering reduces brittleness in hardened steel. However, none of these processes specifically create the hard surface characteristic of case hardening.

2. Identify a common type of aircraft engine.

- A. Piston engine
- B. Turbojet engine
- C. Turbofan engine**
- D. Ramjet engine

A turbofan engine is indeed a common type of aircraft engine, widely used in commercial aviation. This engine operates on the principle of bypassing a significant amount of air around the engine core while still producing thrust through jet propulsion. The design consists of a large fan at the front that draws in air; a portion of this air is directed through the engine core where it is compressed, mixed with fuel, and ignited, while the remaining air bypasses the core, providing additional thrust without the need for combustion. Turbofan engines are favored for their efficiency, especially at subsonic speeds, making them suitable for a variety of aircraft, including passenger jets and cargo planes. They offer a good balance of power and fuel efficiency, resulting in quieter operations compared to other engine types, such as turbojet engines. The importance of understanding the turbofan engine lies in its wide application in modern aviation, leading to significant advancements in aerodynamics and fuel consumption that have made air travel more accessible and economical.

3. What is the term for lifting or flaking of metal due to corrosion residual product buildup?

- A. Granulation
- B. Fretting
- C. Galling
- D. Exfoliation**

Exfoliation refers to the lifting or flaking of metal surfaces, often as a result of corrosion where residual products accumulate. This phenomenon typically occurs in metals that have experienced significant corrosion processes, leading to the formation of layers that do not adhere well to the base material. As these layers develop, they can begin to separate from the underlying metal, creating a flaked or lifted appearance. In the context of aircraft maintenance and repair, understanding exfoliation is crucial, as it can compromise structural integrity and safety. Addressing this issue often requires thorough inspection, removal of the affected layers, and application of protective coatings to prevent further corrosion development. The other terms, while related to different types of wear or damage in metals, do not accurately describe the specific process of lifting or flaking due to corrosion. Granulation involves a different process associated with the formation of small particles, fretting is concerned with wear at contact surfaces, and galling involves the tearing of metal surfaces during mating, which does not align with the definition of exfoliation related to corrosion.

4. Where can technical descriptions of a certificated propeller be located?

- A. Applicable Airworthiness Directives
- B. Propeller Type Certificate Data Sheets**
- C. Aircraft Specifications
- D. Supplemental Type Certificate

The technical descriptions of a certificated propeller are found in the Propeller Type Certificate Data Sheets. These documents provide essential information about the propeller's design, performance characteristics, and any limitations or conditions under which the propeller must be operated. They are crucial for ensuring compliance with safety standards and for the proper installation and maintenance of the propeller on an aircraft. While Airworthiness Directives pertain to specific issues or required actions related to aircraft safety, and Supplemental Type Certificates involve modifications or alterations to existing type certificates, they do not provide the detailed descriptions necessary for understanding a certificated propeller. Aircraft Specifications typically offer a general overview of the aircraft itself rather than the specific technical data for individual components like propellers. Thus, the Propeller Type Certificate Data Sheets serve the essential purpose of documenting the standards and specifications for certificated propellers.

5. In forward horizontal flight, how does the angle of attack of the advancing rotor blade compare to the retreating blade?

- A. More than the retreating blade
- B. Equal to the retreating blade
- C. Less than the retreating blade**
- D. Always greater than the retreating blade

In forward horizontal flight, the angle of attack of the advancing rotor blade is indeed less than that of the retreating blade. This phenomenon occurs due to the rotational dynamics of the rotor system. As the helicopter moves forward, the advancing blade moves into the oncoming relative wind, which increases the speed at that point, effectively decreasing the angle of attack required to maintain lift. Conversely, the retreating blade experiences a decrease in effective airspeed as it moves away from the direction of flight. Because the rotor blades are experiencing different airspeeds (higher for the advancing blade and lower for the retreating blade), the angle of attack must be adjusted accordingly. In essence, the retreating blade needs a higher angle of attack to compensate for the reduced airflow while still generating sufficient lift, whereas the advancing blade has a more favorable flow situation and requires a lower angle of attack. This relationship is crucial in understanding lift dynamics and rotorcraft performance during forward flight.

6. What is the recommended method for removing corrosion from magnesium parts?

- A. Steel wire brushes
- B. High-grit carbon paper
- C. Fine-grit Aluminum oxide
- D. Stiff, nonmetallic brush**

The recommended method for removing corrosion from magnesium parts involves using a stiff, nonmetallic brush. This approach is beneficial because magnesium is a relatively light and soft metal that can be easily damaged by more abrasive materials. A stiff, nonmetallic brush provides the necessary rigidity to effectively remove corrosion without causing further harm to the magnesium surface. Additionally, nonmetallic brushes, like those made from nylon or similar materials, prevent the risk of creating sparks that could ignite flammable materials, which is essential in ensuring safety while working with aviation components. Using this method helps to maintain the integrity of the magnesium parts while safely addressing corrosion issues, ensuring the longevity and reliability of aircraft components. The other methods, such as using steel wire brushes or high-grit carbon paper, can potentially cause surface damage or contamination, compromising the structural integrity of the magnesium. Thus, opting for a stiff, nonmetallic brush is the most appropriate and effective choice for safely removing corrosion from magnesium.

7. What is the maximum permissible grain deviation in wood used for aircraft?

- A. 1:20
- B. 1:15**
- C. 1:5
- D. 1:7

When discussing wood used in aircraft construction, the grain deviation is a crucial factor. The maximum permissible grain deviation of 1:15 indicates that for every 15 units of length, the grain can deviate no more than 1 unit from the straight alignment. This is essential because the strength and stability of the wood are significantly affected by the grain orientation. A deviation greater than this limit might compromise the material's load-bearing capacity and structural integrity, which is critical in aviation applications. This standard acknowledges that well-aligned wood will perform better under the stresses encountered during flight and provide the necessary reliability. Adhering to a grain deviation of 1:15 ensures that the wood maintains optimal performance characteristics, adding safety features to the aircraft design. Recognizing these specifics is vital for anyone working in aircraft construction, repair, and maintenance to ensure compliance with industry standards and enhance safety outcomes.

8. What heat-treating operation chemically changes the surface of the metal by introducing a high carbide or nitride content?

- A. Tempering
- B. Carburizing
- C. Normalizing
- D. Case hardening**

Case hardening is the process that chemically alters the surface of a metal by increasing its hardness through the introduction of carbon or nitrogen compounds. This specific treatment creates a hard outer layer while maintaining a tougher inner core, which enhances the overall durability and wear resistance of the component. During the case hardening process, materials like steel are exposed to carbon or nitrogen-rich environments at elevated temperatures. This leads to the diffusion of these elements into the surface of the metal, resulting in a high concentration of carbides or nitrides. The new surface structure, which is significantly harder than the underlying material, is especially beneficial for components that face significant wear or stress during operation. While tempering helps to relieve stresses post-hardening and normalizing aims to refine grain structure and improve mechanical properties, neither of these processes specifically involves the chemical transformation of the surface layer through the introduction of carbides or nitrides. Carburizing is a technique closely related to case hardening but focuses exclusively on carbon content. Case hardening, therefore, encapsulates both carburizing and nitriding methods, allowing for a more comprehensive treatment strategy for enhancing surface properties.

9. Which tool measures clearance between a surface plate and a narrow surface being checked for flatness?

- A. Depth gauge
- B. Dial indicator
- C. Caliper

D. Thickness gauge

The tool that effectively measures clearance between a surface plate and a narrow surface being checked for flatness is the thickness gauge. This instrument is specifically designed to measure the thickness of materials, which can directly relate to assessing flatness by determining if there is any gap or clearance between the surface being measured and a reference plane, such as a surface plate. Thickness gauges can come in various forms, including digital, mechanical, or feeler gauges, which can fit into narrow spaces to provide accurate readings. When evaluating flatness, the ability to measure small clearances is essential, making this tool particularly suitable for this task. Other instruments mentioned, like depth gauges and dial indicators, have different primary functions. Depth gauges are primarily used to measure how deep a feature is, while dial indicators measure variations in height or distance from a reference point rather than specifically measuring the gap between surfaces. Calipers, though versatile for measuring dimensions like length or width, are not specifically optimized for measuring clearance in flatness checks. Therefore, the thickness gauge is the most appropriate tool for this particular measurement scenario.

10. What does MS20 mean in the context of a rivet?

- A. Metric System measurements is used
- B. Malleable Steel rivet
- C. Military Science

D. Military Standard

In the context of rivets, MS20 refers to Military Standard. Military standards are specifications that ensure materials, products, and systems meet consistent quality and performance criteria for military applications. The designation MS20 indicates that the rivet conforms to established military standards, which is crucial in aerospace and defense sectors where reliability and safety are paramount. Military standards establish specific requirements for the design, materials, and testing methods used for components such as rivets, thereby ensuring compatibility and performance across various military aircraft and equipment. This conformity is essential for maintaining safety, reliability, and interoperability among different military systems. The other choices, while potentially relevant in different contexts, do not accurately describe the meaning of MS20 specifically in regard to rivets. For example, options focusing on metric system measurements or malleable steel do not capture the standardization and specification context embodied by military standards.

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://philscaacrm.examzify.com>

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

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