Remote Pilot

2023 Test Prep

Study and prepare for your remote pilot FAA Knowledge Exam

Includes 5 online
Practice Tests

Remote Pilot

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AVIATION SUPPLIES & ACADEMICS, INC.
NEWCASTLE, WASHINGTON

The FAA Knowledge Exam Questions can change throughout the year. Stay current with test changes; sign up for ASA's free email update service at **asa2fly.com/testupdate**

Remote Pilot Test Prep
2023 Edition

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Sample Federal Aviation Administration (FAA) questions herein contain information as of: August 2022. Stay informed of changes since the book was printed: **asa2fly.com/testupdate**

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Contents

Cross References

FAA Figures

Updates and Practice Tests

Free Test Updates for the One-Year Life Cycle of Test Prep Books

The FAA modifies tests as needed throughout the year. ASA keeps abreast of changes to the tests and posts free Test Updates on the ASA website. Before taking your test, be certain you have the most current information by visiting the ASA Test Updates webpage: **asa2fly.com/testupdate**. Additionally, sign up for free email notifications, which are sent when new Test Updates are available.

We Invite Your Feedback

After you take your FAA exam, let us know how you did. Were you prepared? Did ASA's products meet your needs and exceed your expectations? We want to continue to improve these products to ensure applicants are prepared and become safe aviators. Send your feedback to: **cfi@asa2fly.com**.

Introduction

Welcome to the Aviation Supplies & Academics, Inc., (ASA) Test Prep Series. This series has been helping pilots prepare for the FAA Knowledge Tests for more than 60 years with great success. We are confident that with proper use of this book you will score very well on your Remote Pilot certificate test.

Begin your studies with a classroom or home-study ground school course, which will involve reading a comprehensive textbook. Visit the Reader Resources for this Test Prep (**asa2fly.com/TPUAS**) and become familiar with the FAA guidance materials available for this certification exam. Then use this Test Prep to prepare for your exam: read the question, select your choice for the correct answer, and then read the explanation. Use the references that conclude each explanation to identify additional resources for further study of a subject. Upon completion of your studies, take practice tests at **prepware.com** (see inside the front cover for your activation code).

The questions in this book have been arranged into chapters based on subject matter to promote better understanding, aid recall, and provide a more efficient study guide.

Prior to taking an FAA Airman Knowledge Test, all applicants must establish an FAA Tracking Number (FTN) by creating a profile in the Integrated Airman Certification and Rating Application (IACRA) system at **iacra.faa.gov**. Then visit **faa.psiexams.com** to register for your exam and take FAA-created practice tests to become familiar with the computer testing platform.

It is important to answer every question assigned on your FAA Knowledge Test. If in their ongoing review, the FAA decides a question has no correct answer, is no longer applicable, or is otherwise defective, your answer will be marked correct no matter which one you chose. However, you will not be given the automatic credit if you have not marked an answer. Unlike some other exams you may have taken, there is no penalty for guessing in this instance.

The FAA exams are “closed tests” which means the exact database of questions is not available to the public. The question and answer choices in this book are based on our extensive history and experience with the FAA testing and airman certification process. You might see similarly worded questions on your official FAA exam, or answer stems might be rearranged from the order you see in this book. Therefore, be sure to fully understand the intent of each question and corresponding answer while studying, rather than memorizing the letter associated with the correct response. You may be asked a question that has unfamiliar wording; studying and understanding the information in this book and the associated references will give you the tools to answer question variations with confidence.

If your study leads you to question an answer choice, we recommend you seek the assistance of a local instructor. We welcome your questions, recommendations, and concerns—send them to:

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The FAA appreciates testing experience feedback. You can contact them at:

Federal Aviation Administration
AFS-630, Airman Testing Standards Branch
PO Box 25082
Oklahoma City, OK 73125
Email: afs630comments@faa.gov

Description of the Tests

The FAA Knowledge Exam is an objective, multiple choice test. Each question can be answered by one of the three choices. Each test question is independent of the others—a correct response to one question does not depend on the correct response to another. You must score at least 70 percent to pass the test. Applicants who do not meet the requirements in 14 CFR §107.61 (d)(1), must pass the knowledge test before preparing an application for a Remote Pilot Certificate with a Small UAS Rating.

The table below lists the number of questions and the allotted time for the test. Each question in this book is preceded by a category. Use these categories to study the content that may appear on your test. Study all the questions first, then refer to the following table, placing emphasis on those questions most likely to be included on your test (identified by the test prep category above each question number).

Remote Pilot Unmanned Aircraft General – Small (UAG)

Test Code	Test Name	Number of Questions	Minimum Age	Allotted Time (hrs)
UAG	Unmanned Aircraft General —Small	60	14	2.0
UAS Topics		**Percentage of Items on Test**		
I. Regulations		15–25%		
II. Airspace & Requirements		15–25%		
III. Weather		11–16%		
IV. Loading and Performance		7–11%		
V. Operations		35–45%		

Knowledge Test Registration

The FAA testing provider authorizes hundreds of test center locations that offer a full range of airman knowledge tests. For information on authorized testing centers and to register for the knowledge test, visit **faa.psiexams.com**.

When you contact a knowledge testing center, be prepared to select a test date and make payment. You may register for test(s) several weeks in advance online or by phone, and you may cancel in accordance with the testing center's cancellation policy.

Regardless of your registration method, you will need an FAA Tracking Number (FTN) prior to registering for the FAA Airman Knowledge Test. This FTN will follow you throughout your aviation career. You will obtain your FTN as part of the test registration process, by creating a profile in the Integrated Airman Certificate and Rating Application (IACRA) system at **iacra.faa.gov/IACRA**. This FTN will be printed on your Airman Knowledge Test Report (AKTR).

The test registration process includes collection of this information: name, FTN, physical address, date of birth, email address, photo identification, phone number, test authorization (credentials of the individual such as an instructor endorsement), and previous number of test attempts.

For more information, contact:
PSI Services LLC
844-704-1487 or examschedule@psionline.com
faa.psiexams.com

Acceptable Forms of Authorization

You must be at least 14 years of age to take the FAA Knowledge Exam. When you take your FAA Knowledge Test, you will be required to show proper identification which contains your photograph, signature, date of birth, and current government-issued address (if your permanent mailing address is a post office box number).

The UAG test does not require an instructor endorsement or other form of written authorization. For retesting, see Retesting Procedures.

Acceptable Materials

The applicant may use the following aids, reference materials, and test materials during the test, as long as the material does not include actual test questions or answers.

Acceptable Materials	Unacceptable Materials	Notes
Supplement book provided by proctor.	Written materials that are handwritten, printed, or electronic.	Testing centers may provide calculators and/or deny the use of personal calculators.
All models of aviation-oriented calculators or small electronic calculators that perform only arithmetic functions.	Electronic calculators incorporating permanent or continuous type memory circuits without erasure capability.	Test proctor may prohibit the use of your calculator if he or she is unable to determine the calculator's erasure capability.
Calculators with simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory; or simple functions, such as square root and percentages.	Magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which pre-written programs or information related to the test can be stored and retrieved.	Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.
Scales, straight-edges, protractors, plotters, navigation computers, blank log sheets, holding pattern entry aids, and electronic or mechanical calculators that are directly related to the test.	Dictionaries.	Before, and upon completion of the test, while in the presence of the test proctor, actuate the ON/OFF switch or RESET button, and perform any other function that ensures erasure of any data stored in memory circuits.
Manufacturer's permanently inscribed instructions on the front and back of such aids, such as formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, weight and balance formulas, and ATC procedures.	Any booklet or manual containing instructions related to use of test aids.	Test proctor makes the final determination regarding aids, reference materials, and test materials.

Testing Procedures for Applicants Requesting Special Accommodations

If you are an applicant with a learning or reading disability, you may request approval from the local FAA office to take an airman knowledge test, using the special accommodations procedures outlined in the most current version of FAA Order 8080.6 Conduct of Airman Knowledge Tests.

Prior to approval of any option, the FAA Aviation Safety Inspector must advise you of the regulatory certification requirement of being able to read, write, speak, and understand the English language.

Test Reports

Your test will be graded immediately upon completion and your score will display on the computer screen. You will receive your Airman Knowledge Test Report (AKTR), which will state your score.

Visit **faa.psiexams.com** to request a duplicate or replacement AKTR due to loss or destruction.

Airman Knowledge Test Reports are valid for 24 calendar months preceding the month you complete the practical test. If the AKTR expires before completion of the practical test, you must retake the knowledge test.

The AKTR lists the Airman Certification Standard (ACS) code for questions answered incorrectly. The total number of ASCs shown on the AKTR is not necessarily an indication of the total number of questions answered incorrectly. Study these knowledge areas to improve your understanding of the subject matter. See Cross-Reference B in the back of this book for a listing of ASCs and their associated questions.

An ACS code consists of four elements. This code is deciphered as follows:

UA.I.B.K10

UA—Applicable ACS (Unmanned Aircraft Systems)
I—Area of Operation (Regulations)
B—Task (Operating Rules)
K10—Task element (Knowledge 10: Visual line of sight aircraft operations)

Retesting Procedures

Applicants retesting ***after failure*** are required to submit the applicable AKTR indicating failure, along with an endorsement (on the test report) from an authorized instructor, who gave the applicant the additional training, certifying the applicant is competent to pass the test. The original failed AKTR and retest endorsement presented as authorization shall be retained by the proctor and attached to the applicable sign-in/out log. The latest test taken will reflect the official score.

Applicants retesting ***in an attempt to achieve a higher passing score*** may retake the same test for a better grade after 30 days. The latest test taken will reflect the official score. Applicants are required to submit the original applicable AKTR indicating previous passing score to the testing center prior to testing. Testing center personnel must collect and destroy this report prior to issuing the new test report.

Cheating or Other Unauthorized Conduct

Computer testing centers must follow strict security procedures to avoid test compromise. These procedures are established by the FAA and are covered in FAA Order 8080.6 Conduct of Airman Knowledge Tests. The FAA has directed testing centers to terminate a test at any time a test proctor suspects a cheating incident has occurred. An FAA investigation will then be conducted. If the investigation determines that cheating or unauthorized conduct has occurred, then any airman certificate or rating that you hold may be revoked, and you will be prohibited for one year from applying for or taking any test for a certificate or rating under 14 CFR Part 61, Part 107, or Part 65.

Test-Taking Tips

Prior to launching the actual test, the test proctor's testing software will provide you with an opportunity to practice navigating through the test. This practice (or tutorial) session may include a "sample" question(s). These sample questions have no relation to the content of the test, but are meant to familiarize you with the look and feel of the system screens, including selecting an answer, marking a question for later review, time remaining for the test, and other features of the testing software.

Follow these time-proven tips, which will help you develop a skillful, smooth approach to test-taking:

- Be careful to fully understand the intent of each question and corresponding answer while studying, rather than memorize the A, B, C answer choice—answer stems may appear in a different order than you studied and have some wording differences.
- Remember to bring a photo I.D., the testing fee if you didn't pay at the time of registration, calculator, flight computer (ASA's E6-B or CX-3 Flight Computer), plotter, magnifying glass, and a sharp pointer, such as a safety pin.
- Your first action when you sit down should be to write any formulas and information you can remember from your study on the scratch paper they will provide. Remember, some of the formulas may be on your E6-B.
- Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
- After formulating an answer, determine which answer choice corresponds the closest with your answer. The answer chosen should completely resolve the problem.
- From the answer choices given, it may appear that there is more than one possible answer. However, there is only one answer that is correct and complete. The other answers are either incomplete, erroneous, or represent popular misconceptions.
- Answer each question in accordance with the latest regulations and guidance publications.
- If a certain question is difficult for you, tag it for REVIEW and proceed to the other questions. After you answer the less difficult questions, return to those which you tagged and answer them. Be sure to untag these questions once you have answered them. The review marking procedure will be explained to you prior to starting the test. Although the computer should alert you to unanswered questions, make sure every question has an answer recorded. This will allow you to use the available time to your maximum advantage.
- Perform each math calculation twice to confirm your answer. If adding or subtracting a column of numbers, reverse your direction the second time to reduce the possibility of error.
- When solving a calculation problem, select the answer nearest to your solution.

- Remember that information is provided in the Legends and Figures contained within the Airman Knowledge Testing Supplement (FAA-CT-8080 document) you'll be using during the test.
- Remember to answer every question, even the ones with no completely correct answer, to ensure the FAA gives you credit for a bad question.
- Take your time and be thorough but relaxed. Take a minute off every half-hour or so to relax your brain and body. Get a drink of water halfway through the test.

Remote Pilot Certificate Eligibility Requirements

When applying for a Remote Pilot Certificate with a Small UAS Rating, in addition to the eligibility requirements of 14 CFR §107.61, you must meet one of the following:

- Applicant must provide an AKTR, which shows that you have passed the UAG aeronautical knowledge test as described in §107.73.
- If you hold a pilot certificate issued under Part 61 and meet the recency requirements specified in §61.56, you must provide a certificate of completion of a Part 107 initial training course. A qualifying initial training course is available at **faasafety.gov**. You must also show, via logbook entry or other method acceptable to the Administrator, that you meet the flight review requirements of §61.56.

The application must be submitted to a Flight Standards District Office (FSDO), a designated pilot examiner (DPE), an airman certification representative for a pilot school, a certified flight instructor (CFI), or other person authorized by the Administrator to process the application.

English Language Proficiency

In accordance with the requirements of §107.61(b) and the FAA Aviation English Language Proficiency standard, throughout the application and testing process, you must demonstrate the ability to read, write, speak, and understand the English language.

Knowledge Exam References

The FAA references the following documents to write the FAA Knowledge Exam questions. You should be familiar with all of these as part of your ground school studies, which you should complete before starting test preparation.

FAA-H-8083-2 *Risk Management Handbook*
FAA-H-8083-3 *Airplane Flying Handbook*
FAA-G-8082-22 *Remote Pilot sUAS Study Guide*
FAA-H-8083-25 *Pilot's Handbook of Aeronautical Knowledge*

AC 00-6 *Aviation Weather*
AC 00-45 *Aviation Weather Services*
AC 91-57 *Model Aircraft Operating Standards*
AC 107-2 *Small Unmanned Aircraft Systems (sUAS)*
AC 150-5200-32 *Reporting Wildlife Aircraft Strikes*

SAFO 09013 *Fighting Fires Caused By Lithium Type Batteries in Portable Electronic Devices*
SAFO 10015 *Flying in the Wire Environment*
SAFO 10017 *Risks in Transporting Lithium Batteries in Cargo by Aircraft*
SAFO 15010 *Carriage of Spare Lithium Batteries in Carry-on and Checked Baggage*

Chart Supplements U.S.

Aeronautical Information Manual (AIM)
14 CFR Parts 1, 48, 61, 68, 89, 91, 107
49 CFR Part 1544

Visit **asa2fly.com** for these and many more titles and pilot supplies for your aviation endeavors. Visit **asa2fly.com/TPUAS** for reader resources useful to both remote pilots and manned pilots operating in the presence of unmanned aircraft systems.

Acronyms

For reference, acronyms appearing in this book are defined below.

AC	Advisory Circular
ACS	Airman Certification Standard
ADDS	Aviation Digital Data Services (NOAA)
ADM	aeronautical decision making
AGL	above ground level
AIM	Aeronautical Information Manual
AIRMET	airman's meteorological information
AIS	Abbreviated Injury Scale
AKTR	Airman Knowledge Test Report
ASOS	Automated Surface Observing System
ATC	air traffic control
ATCT	air traffic control tower
ATIS	Automatic Terminal Information Service
AWC	Aviation Weather Center
AWOS	Automated Weather Observing System
CFI	certified flight instructor
CG	center of gravity
CoW	Certificate of Waiver
CRM	crew resource management
CS	control station
CTAF	Common Traffic Advisory Frequency
DOC	Declaration of Compliance
DPE	designated pilot examiner
FB	winds and temperatures aloft forecast
FCC	Federal Communications Commission
FL	flight level
FLIP	Flight Information Publication (Department of Defense)
FRIA	FAA-recognized identification area
FSDO	Flight Standards District Office
FSS	Flight Service Station
FTP	flight termination point
GPS	Global Positioning System
IACRA	Integrated Airman Certificate and/or Rating Application
ICAO	International Civil Aviation Organization
IFR	instrument flight rules
ILS	instrument landing system
IR	IFR Military Training Route
LAA	Local Airport Advisory
LOA	Letter of Agreement
LOC	loss of control
METAR	aviation routine weather report
MOA	Military Operation Area
MOC	means of compliance
MSL	mean sea level
MTR	Military Training Route
NAS	National Airspace System
NAVAID	navigational aid
NFDC	National Flight Data Center
NM	nautical mile
NMACS	FAA Near Midair Collision System
NOTAM	Notice to Air Missions
NTIA	National Telecommunications and Information Administration (Department of Commerce)
NTSB	National Transportation Safety Board
OAT	outside air temperature
OTC	over-the-counter
PIC	pilot-in-command
POH	pilot's operating handbook
ROC	Regional Operations Center (FAA)
RVR	runway visual range
SAA	Special Activity Airspace
SIDA	Security Identification Display Area
SIGMET	significant meteorological information
SM	statute mile
SMS	safety management system
sUA	small unmanned aircraft
sUAS	small unmanned aircraft system
TAC	Terminal Area Chart
TAF	terminal aerodrome forecast
TFR	temporary flight restriction
TSA	Transportation Security Administration
UA	unmanned aircraft
UTC	Coordinated Universal Time
VFR	visual flight rules
VLOS	visual line-of-sight
VO	visual observer
VR	VFR Military Training Route

ASA Test Prep Layout

Sample FAA questions have been sorted into chapters according to subject matter. Within each chapter, similar questions are grouped together following introductory chapter text. Figures referenced in the chapter text are numbered with the appropriate chapter number, e.g., "Figure 1-1" is Chapter 1's first chapter text figure.

Some sample FAA questions refer to Figures or Legends immediately following the question number, e.g., "1201. (Refer to Figure 14.)." These are FAA Figures and Legends from the Airman Knowledge Testing Supplement (FAA-CT-8080-2H) that can be found at the back of this book. This supplement will be provided to you as a separate booklet when you take your FAA test.

Following each sample FAA test question is ASA's explanation in italics. The last line of the explanation contains an ACS code and a reference for further study. Some questions include an explanation for the incorrect answers for added clarity. When you encounter a difficult question, find the ACS code in the table in Cross-Reference B, and then look for material relating to the subject description within the given reference(s). Refer to Cross-Reference B for more information on how to use ACS codes for effective studying.

Answers to each question are found at the bottom of each page.

EXAMPLE:

Chapter text

Four aerodynamic forces are considered to be basic because they act upon an aircraft during all flight maneuvers. There is the downward-acting force called WEIGHT which must be overcome by the upward-acting force called LIFT, and there is the rearward-acting force called DRAG, which must be overcome by the forward-acting force called THRUST.

1201. (Refer to Figure 2.) The four forces acting on an airplane in flight are

See the Airman Knowledge Testing Supplement found at the back of the book.

A— lift, weight, thrust, and drag.
B— lift, weight, gravity, and thrust.
C— lift, gravity, power, and friction.

Question and answer choices

Lift, weight, thrust, and drag are the four basic aerodynamic forces acting on an aircraft in flight. (UA.IV.A.K1a) — FAA-H-8083-25

Explanation

Code line. FAA ACS code in parentheses, followed by references for further study.

Answer (B) is incorrect because the force of gravity is always the same number and reacts with the airplane's mass to produce a different weight for almost every airplane. Answer (C) is incorrect because weight is the final product of gravity, thrust is the final product of power, and drag is the final product of friction. Power, gravity, and friction are only parts of the aerodynamic forces of flight.

Incorrect answer explanation. Reasons why answer choices are *incorrect* explained here.

Chapter 3
Weather

Introduction

As with any flight, the remote PIC should check and consider the weather conditions prior to and during every sUAS flight. Even though sUAS operations are often conducted at very low altitudes, weather factors can greatly influence performance and safety of flight. Specifically, factors that affect sUAS performance and risk management include:

- Atmospheric pressure and stability;
- Wind and currents;
- Uneven surface heating;
- Visibility and cloud clearance; and
- Precipitation.

The major source of all weather is the sun. Every physical process of weather, change, or variation of weather patterns is accompanied by or is a result of unequal heating of the Earth's surface. The heating of the Earth (and therefore the heating of the air surrounding the Earth) is imbalanced around the entire planet. Both north and south of the equator, due to the different angle sunlight hits the Earth, one square foot of sunrays is not concentrated over one square foot of the surface, but over a larger area. This lower concentration of sunrays produces less radiation of heat over a given surface area; therefore, less atmospheric heating takes place in that area. The unequal heating of the Earth's atmosphere creates a large air-cell circulation pattern (wind) because the warmer air has a tendency to rise (associated with low pressure systems) and the colder air has a tendency to settle or descend (associated with high pressure systems) and replace the rising warmer air. This unequal heating, which causes pressure variations, will also cause variations in barometric altimeter settings between weather reporting points.

Different surfaces radiate heat in varying amounts. The resulting uneven heating of the air creates small areas of local circulation called convective currents. Convective currents can cause turbulent air that has the potential to dramatically affect the remote PIC's ability to control unmanned aircraft at lower altitudes. For example:

- Plowed ground, rocks, sand, barren land, pavement, and urban areas give off a large amount of heat and are likely to result in updrafts.
- Water, trees, and other areas of vegetation tend to absorb and retain heat and are likely to result in downdrafts.

1135. Which of the following considerations is most relevant to a remote PIC when evaluating unmanned aircraft performance?

A—Current weather conditions.
B—The number of available ground crew.
C—The type of sUAS operation.

Weather factors can greatly influence sUAS performance and safety of flight. (UA.III.B.K1) — AC 107-2

1136. Every physical process of weather is accompanied by, or is the result of, a

A—movement of air.
B—pressure differential.
C—heat exchange.

Every physical process of weather is accompanied by, or is a result of, unequal heating of the Earth's surface. (UA.III.B.K1c) — AC 00-6

Answers

1135 [A] 1136 [C]

1137. What causes variations in altimeter settings between weather reporting points?

A—Unequal heating of the Earth's surface.
B—Variation of terrain elevation.
C—Coriolis force.

All altimeter settings are corrected to sea level. Unequal heating of the Earth's surface causes pressure differences. (UA.III.B.K1c) — AC 00-6

1138. The development of thermals depends upon

A—a counterclockwise circulation of air.
B—temperature inversions.
C—solar heating.

Thermals are updrafts in convective currents dependent on solar heating. A temperature inversion would result in stable air with very little, if any, convective activity. (UA.III.B.K1c) — AC 00-6

1139. (Refer to Figure 20.) Over which area should a remote pilot expect to find the highest amount of thermal currents under normal conditions?

A—2.
B—7.
C—5.

Dry areas get hotter than moist areas. Dry fields or dry ground of any nature are better thermal sources than moist areas. This applies to woods or forests, which are poor sources of thermals because of the large amount of moisture given off by foliage. (UA.III.B.K1c) — AC 00-6

1272. Clouds, fog, or dew will always form when

A—water vapor condenses.
B—water vapor is present.
C—relative humidity reaches 100 percent.

As water vapor condenses or sublimates on condensation nuclei, liquid or ice particles begin to grow. Some condensation nuclei have an affinity for water and can induce condensation or sublimation even when air is almost, but not completely, saturated. (UA.III.B.K1d) — AC 00-6

Answer (B) is incorrect because the presence of water vapor does not result in clouds, fog, or dew unless condensation occurs. Answer (C) is incorrect because it is possible to have 100% humidity without the occurrence of condensation, which is necessary for clouds, fog, or dew to form.

Wind

Wind and currents can affect sUAS performance and maneuverability during all phases of flight. Be vigilant when operating sUAS at low altitudes, in confined areas, near buildings or other manmade structures, and near natural obstructions (such as mountains, bluffs, or canyons). Consider the following effects of wind on performance:

- Obstructions on the ground affect the flow of wind, may create rapidly changing wind speed and direction, and can be an unseen danger.
- High winds may make it difficult to maintain a geographical position in flight and may consume more battery power or preclude aircraft control and recovery.

Local conditions, geological features, and other anomalies can change the wind direction and speed close to the Earth's surface. For example, when operating close to a building, winds blowing against the building could cause strong updrafts that can result in ballooning or a loss of positive control. On the other hand, winds blowing over the building from the opposite side can cause significant downdrafts that can have a dramatic sinking effect on the unmanned aircraft that may exceed its climb performance.

The intensity of the turbulence associated with ground obstructions depends on the size of the obstacle and the primary velocity of the wind. This same condition is even more noticeable when flying in mountainous regions. While the wind flows smoothly up the windward side of the mountain and the

Answers

1137 [A] 1138 [C] 1139 [A] 1272 [A]

upward currents help to carry an aircraft over the peak of the mountain, the wind on the leeward side does not act in a similar manner. As the air flows down the leeward side of the mountain, the air follows the contour of the terrain and is increasingly turbulent. This tends to push an aircraft into the side of a mountain. The stronger the wind, the greater the downward pressure and turbulence become. Due to the effect terrain has on the wind in valleys or canyons, downdrafts can be severe. Even small hills or odd shaped terrain can have similar effects on local wind conditions. Remote pilots should be aware that terrain/object wind effects may exist for some distance downwind of the actual terrain or object.

1140. While operating around buildings, the remote PIC should be aware of the creation of wind gusts that

A—change rapidly in direction and speed causing turbulence.
B—enhance stability and imagery.
C—increase performance of the aircraft

Local conditions, geological features, and other anomalies can change the wind direction and speed close to the Earth's surface, making it difficult to control and maneuver the sUAS. (UA.III.B.K1b) — FAA-H-8083-25

1141. A strong steady wind exists out of the north. You need to photograph an area to the south of your location. You are located in an open field with no obstructions. Which of the following is not a concern during this operation?

A—Strong wind conditions may consume more battery power at a faster rate than in calm conditions.
B—Turbulent conditions will likely be a significant factor during the operation.
C—Strong wind may exceed the performance of the sUAS making it impossible to recover.

Unmanned aircraft often have limited performance and therefore in high wind conditions, it may consume more power to maintain position or other maneuvers than in calm air. If the wind is strong enough, the sUAS's performance might not be able to adequately counter the wind, making it difficult or impossible to fly back to you for recovery. (UA.III.B.K1b) — FAA-H-8083-25, 14 CFR §107.49

1278. Wind shear can exist

A—at all altitudes.
B—at low altitudes.
C—at high altitudes.

Wind shear is a sudden, drastic change in wind speed and/or direction over a very small area. Wind shear can subject an aircraft to violent updrafts and downdrafts, as well as abrupt changes to the horizontal movement of the aircraft. While wind shear can occur at any altitude, low-level wind shear is especially hazardous due to the proximity of an aircraft to the ground. (UA.III.B.K1b) — AC 00-6

Air Masses and Fronts

When a body of air comes to rest on, or moves slowly over, an extensive area having fairly uniform properties of temperature and moisture, the air takes on these properties. The area over which the air mass acquires its identifying distribution of temperature and moisture is its source region. As this air mass moves from its source region, it tends to take on the properties of the new underlying surface. The trend toward change is called air mass modification. When an air mass that is different in such properties advances upon a dissimilar air mass, the division line is referred to as a front.

A ridge is an elongated area of high pressure. A trough is an elongated area of low pressure. All fronts lie in troughs. A cold front is the leading edge of an advancing cold air mass. Cold fronts are often accompanied by poor weather ahead of the front, which passes relatively quickly. Once the front has passed, there is a wind shift and, due to the increased wind speeds, turbulence is common for a period of time. More severe cold fronts can also produce thunderstorms, hail, and tornadoes.

Answers

1140 [A] 1141 [B] 1278 [A]

A warm front is the leading edge of an advancing warm air mass. Warm fronts move about half as fast as cold fronts and have more widespread impact on weather. They are often preceded by lowered ceilings, increased precipitation, and reduced visibilities. Remote PICs should be aware of ambient and approaching weather systems as they can significantly impact their operations and safety of flight. Frontal waves and cyclones (areas of low pressure) usually form on slower-moving cold fronts or stationary fronts. These types of systems are often accompanied by conditions that may be unfavorable to sUAS operations. Figure 3-1 shows the symbols that would appear on a weather map.

The physical manifestations of a warm or cold front can be different with each front. They vary with the speed of the air mass on the move and the degree of stability of the air mass being overtaken. A stable air mass forced aloft will continue to exhibit stable characteristics, such as stratus clouds, calm air, steady precipitation, and poor visibility, while an unstable air mass forced to ascend will continue to be characterized by cumulus clouds, turbulence, showery precipitation, and good visibility.

Frontal passage will be indicated by the following discontinuities:

1. A temperature change (the most easily recognizable discontinuity);
2. A continuous decrease in pressure followed by an increase as the front passes; and
3. A shift in the wind direction, speed, or both.

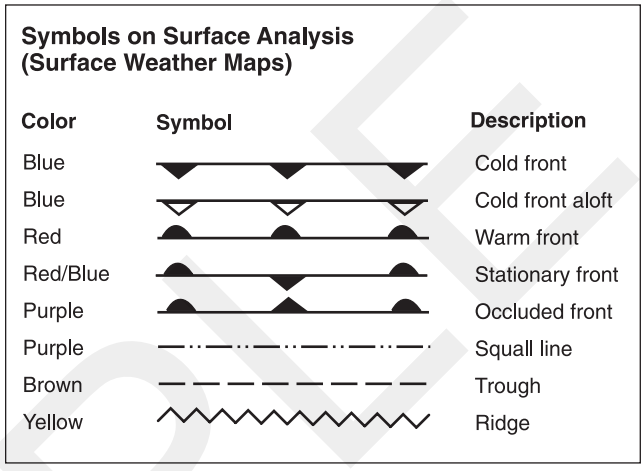

Figure 3-1. Weather map symbols

1142. One of the most easily recognized discontinuities across a front is

A—a change in temperature.
B—an increase in cloud coverage.
C—an increase in relative humidity.

Temperature is one of the most easily recognized discontinuities across a front. (UA.III.B.K1d) — AC 00-6

Answer (B) is incorrect because cloud coverage is not always present across a front. Answer (C) is incorrect because relative humidity is not an easily recognized discontinuity across a front.

1143. One weather phenomenon which will always occur when flying across a front is a change in the

A—wind direction.
B—type of precipitation.
C—stability of the air mass.

Wind direction always changes across a front. (UA.III.B.K1d) — AC 00-6

Answer (B) is incorrect because precipitation does not always exist with a front. Answer (C) is incorrect because the stability on both sides of the front may be the same.

1144. Which type of weather phenomenon that may concern a remote pilot is common among cold fronts?

A—Long-term periods of reduced visibility.
B—Long periods of steady precipitation.
C—Thunderstorms and heavy rain.

Thunderstorms and heavy rain are common, although not always, associated with cold fronts. (UA.III.B.K1d) — AC 00-6

Answers (A) and (B) are incorrect because these characteristics would most typically be associated with warm fronts.

1286. What weather provides the best flying conditions?

A—Warm, moist air.
B—Cool, dry air.
C—Turbulence.

The combination of moisture and temperature determine the stability of the air and the resulting weather. Cool, dry air is very stable and resists vertical movement, which leads to good and generally clear weather. (UA.III.B.K1d) — AC 00-6

Answers

1142 [A] 1143 [A] 1144 [C] 1286 [B]

1277. The zone between different temperature, humidity, and wind is called

A—A front.
B—An air mass.
C—Wind shear.

The zone between two different air masses is a frontal zone or front. Across this zone, temperature, humidity and wind often change rapidly over short distances. (UA.III.B.K1d) — AC 00-6

Atmospheric Stability

Atmospheric stability is defined as the resistance of the atmosphere to vertical motion. A stable atmosphere resists any upward or downward movement. An unstable atmosphere allows an upward or downward disturbance to grow into a vertical (convective) current.

Determining the stability of the atmosphere requires measuring the difference between the actual existing (ambient) temperature lapse rate of a given parcel of air and the dry adiabatic (3°C per 1,000 feet) lapse rate. Because sUAS operate at low altitudes, it may seem as though lapse rate may not be a factor, but the stability of the local air mass can have significant impact on ambient conditions. Unstable air can often result in weather conditions unfavorable to sUAS operations.

A stable layer of air would be associated with a temperature inversion (a condition in which warm air is situated above cool or cold air). Warming from below, on the other hand, would decrease the stability of an air mass. The conditions shown in Figure 3-2 can be characteristic of stable or unstable air masses.

Unstable Air	Stable Air
Cumuliform clouds	Stratiform clouds and fog
Showery precipitation	Continuous precipitation
Rough air (turbulence)	Smooth air
Good visibility except in blowing obstructions	Fair to poor visibility in haze and smoke

Figure 3-2. Characteristics of stable and unstable air masses

1145. A stable air mass is most likely to have which characteristic?

A—Showery precipitation.
B—Turbulent air.
C—Poor surface visibility.

Characteristics of a stable air mass include stratiform clouds and fog, continuous precipitation, smooth air, and fair to poor visibility in haze and smoke. (UA.III.B.K1c) — FAA-H-8083-25

1146. What are characteristics of a moist, unstable air mass?

A—Turbulence and showery precipitation.
B—Poor visibility and smooth air.
C—Haze and smoke.

Characteristics of a moist, unstable air mass include cumuliform clouds, showery precipitation, rough air (turbulence), and good visibility (except in blowing obstructions). (UA.III.B.K1c) — AC 00-6

1147. What are characteristics of stable air?

A—Good visibility and steady precipitation.
B—Poor visibility and steady precipitation.
C—Poor visibility and intermittent precipitation.

Characteristics of a stable air mass include stratiform clouds and fog, continuous precipitation, smooth air, and fair to poor visibility in haze and smoke. (UA.III.B.K1c) — FAA-H-8083-25

1148. What measurement can be used to determine the stability of the atmosphere?

A—Atmospheric pressure.
B—Actual lapse rate.
C—Surface temperature.

The difference between the existing lapse rate of a given mass of air and the adiabatic rates of cooling in upward moving air determines if the air is stable or unstable. (UA.III.B.K1c) — AC 00-6

Answers

1277 [A] 1145 [C] 1146 [A] 1147 [B] 1148 [B]

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