



Private Pilot - ASEL Certification Ground School Course Study Guide

This is a comprehensive study guide for CCA Private Pilot Ground School, where aspiring aviators embark on a journey to master the fundamental principles of aviation, airspace regulations, and aeronautical decision-making to pave the way for safe and confident flight. Use this Study Guide to direct your preparation for each class and, exam and ultimately, the FAA Airman Knowledge Test.

All figure references: [FAA Test Supplement](#)

Stage 1 | Lesson 1 - Introduction into Aviation

Required Reading: FAA 8083-25B (PHAK) {Chapters 1 and 3}; FAA 8083-3C (AFH) {Chapter 1}

Suggested Videos:

- [Overview of the FAA](#)
- [FAA Certification](#)
- [Parts of an Airplane](#)
- [Axes of Movement](#)
- [Intro to Lift Theory](#)
- [Lift Demo](#)

FAA Exam Prep Questions:

1. The four forces acting on an airplane in flight are
 - a. lift, weight, thrust, and drag.
 - b. lift, weight, gravity, and thrust.
 - c. lift, gravity, power, and friction.
2. When are the four forces that act on an airplane in equilibrium?
 - a. During unaccelerated flight.
 - b. When the aircraft is accelerating.
 - c. When the aircraft is at rest on the ground.
3. Which statement relates to Bernoulli's principle?
 - a. For every action there is an equal and opposite reaction.
 - b. An additional upward force is generated as the lower surface of the wing deflects air downward.
 - c. Air traveling faster over the curved upper surface of an airfoil causes lower pressure on the top surface.
4. With respect to the certification of airmen, which is a category of aircraft?
 - a. Gyroplane, helicopter, airship, free balloon.
 - b. Airplane, rotorcraft, glider, lighter-than-air.
 - c. Single-engine land and sea, multiengine land and sea.

5. FAA advisory circulars containing subject matter specifically related to Airmen are issued under which subject number?
- 60.
 - 70.
 - 90.

Stage 1 | Lesson 2 - Aerodynamics of Flight - Lift and Stability

Required Reading: FAA 8083-25B (PHAK) {Chapter 4 and 5}

Suggested Videos:

- [Basic Flight Maneuvers](#)
- [Principles of Flight](#)
- [Wake Avoidance](#)
- [Stability](#)

FAA Exam Prep Questions:

1. When landing behind a large aircraft, the pilot should avoid wake turbulence by staying
 - a. above the large aircraft's final approach path and landing beyond the large aircraft's touchdown point.
 - b. below the large aircraft's final approach path and landing before the large aircraft's touchdown point.
 - c. above the large aircraft's final approach path and landing before the large aircraft's touchdown point.
2. What must a pilot be aware of as a result of ground effect?
 - a. Wingtip vortices increase creating wake turbulence problems for arriving and departing aircraft.
 - b. Induced drag decreases; therefore, any excess speed at the point of flare may cause considerable floating.
 - c. A full stall landing will require less up elevator deflection than would a full stall when done free of ground effect.
3. The condition that requires maximum caution when avoiding wake turbulence on landing is a
 - a. light, quartering headwind.
 - b. light, quartering tailwind.
 - c. strong headwind.
4. An airplane said to be inherently stable will
 - a. be difficult to stall.
 - b. require less effort to control.
 - c. not spin.
5. What determines the longitudinal stability of an airplane?
 - a. The location of the CG with respect to the center of lift.
 - b. The effectiveness of the horizontal stabilizer, rudder, and rudder trim tab.
 - c. The relationship of thrust and lift to weight and drag.

Stage 1 | Lesson 3 - Aerodynamics of Flight - Stalls and the Propeller

Required Reading: FAA 8083-25B (PHAK) {Chapter 4 and 5}

Suggested Videos:

- [Intro to Stalls](#)
- [Stall Aerodynamics](#)
- [Stall Wind Tunnel](#)
- [Stall Airflow](#)
- [Aircraft Propeller](#)
- [Left Turning Tendencies](#)
- [Propeller Tendencies](#)

FAA Exam Prep Questions:

1. Which basic flight maneuver increases the load factor on an airplane as compared to straight-and-level flight?
 - a. Climbs.
 - b. Turns.
 - c. Stalls.
2. Most training airplanes are designed so that the wing stall begins
 - a. At the wing tip inward to the wing root.
 - b. At the wing root outward to the wing tip.
 - c. At the trailing edge of the wing toward the leading edge of the wing.
3. What is the definition of load factor?
 - a. Angle of bank relative to an increase in stall speed.
 - b. Angle of bank relative to the power-off stall speed in a specified configuration.
 - c. Additional weight carried by the wings divided by the weight of the aircraft.
4. How does frost affect the lifting surfaces of an airplane on takeoff?
 - a. Frost may prevent the airplane from becoming airborne at normal takeoff speed.
 - b. Frost will change the camber of the wing, increasing lift during takeoff.
 - c. Frost may cause the airplane to become airborne with a lower angle of attack at a lower indicated airspeed.
5. In what flight condition is torque effect the greatest in a single-engine airplane?
 - a. Low airspeed, high power, high angle of attack.
 - b. Low airspeed, low power, low angle of attack.
 - c. High airspeed, high power, high angle of attack.

Stage 1 | Lesson 4 - Aircraft Flight Control and Systems - Flight Controls, Electrical, and Hydraulic

Required Reading: FAA 8083-25B (PHAK) {Chapters 6 and 7}

Suggested Videos:

- [Basic Flight Controls](#)
- [Electrical System](#)
- [Landing Gear System](#)
- [Hydraulic System](#)
- [Adverse Yaw](#)

FAA Exam Prep Questions:

1. What is one purpose of wing flaps?
 - a. To enable the pilot to make steeper approaches to a landing without increasing the airspeed.
 - b. To relieve the pilot of maintaining continuous pressure on the controls.
 - c. To decrease wing area to vary the lift.
2. What is the purpose of the rudder on an airplane?
 - a. To control yaw.
 - b. To control overbanking tendency.
 - c. To control roll.
3. One of the main functions of flaps during approach and landing is to
 - a. decrease the angle of descent without increasing the airspeed.
 - b. permit a touchdown at a higher indicated airspeed.
 - c. increase the angle of descent without increasing the airspeed.
4. Changes in the center of pressure of a wing affect the aircraft's
 - a. lift/drag ratio.
 - b. lifting capacity.
 - c. aerodynamic balance and controllability.
5. An electrical system failure (battery and alternator) occurs during flight. In this situation, you would
 - a. experience avionics equipment failure.
 - b. probably experience failure of the engine ignition system, fuel gauges, aircraft lighting system, and avionics equipment.
 - c. probably experience engine failure due to the loss of the engine-driven fuel pump and also experience failure of the radio equipment, lights, and all instruments that require alternating.

Stage 1 | Lesson 5 - Aircraft Flight Control and Systems - Powerplant

Required Reading: FAA 8083-25B (PHAK) {Chapters 6 and 7}

Suggested Videos:

- [Airplane Engine Overview](#)
- [Aviation Piston Engine](#)
- [Magneto Basics](#)

FAA Exam Prep Questions:

1. What is one procedure to aid in cooling an engine that is overheating?
 - a. Enrichen the fuel mixture.
 - b. Increase the RPM.
 - c. Reduce the airspeed.
2. Detonation may occur at high-power settings when
 - a. The fuel mixture ignites instantaneously instead of burning progressively and evenly.
 - b. an excessively rich fuel mixture causes an explosive gain in power.
 - c. the fuel mixture is ignited too early by hot carbon deposits in the cylinder.

3. The presence of carburetor ice in an aircraft equipped with a fixed-pitch propeller can be verified by applying carburetor heat and noting
 - a. an increase in RPM and then a gradual decrease in RPM.
 - b. a decrease in RPM and then a constant RPM indication.
 - c. a decrease in RPM and then a gradual increase in RPM.
4. An abnormally high engine oil temperature indication may be caused by
 - a. the oil level being too low.
 - b. operating with a too high viscosity oil.
 - c. operating with an excessively rich mixture.
5. The operating principle of float-type carburetors is based on the
 - a. automatic metering of air at the venturi as the aircraft gains altitude.
 - b. difference in air pressure at the venturi throat and the air inlet.
 - c. increase in air velocity in the throat of a venturi causing an increase in air pressure.

Stage 1 | Lesson 6 - Aircraft Flight Control and Systems - Fuel and Engine Controls

Required Reading: FAA 8083-25B (PHAK) {Chapters 6 and 7}

Suggested Videos:

- [Fuel System](#)
- [Oil System](#)
- [Constant Speed Propeller](#)
- [How a carburetor works](#)
- [Environmental System \(ECS\)](#)
- [Icing Systems](#)
- [Oxygen Rules](#)
- [Carburetor Icing](#)

FAA Exam Prep Questions:

1. The basic purpose of adjusting the fuel/air mixture at altitude is to
 - a. decrease the amount of fuel in the mixture in order to compensate for increased air density.
 - b. decrease the fuel flow in order to compensate for decreased air density.
 - c. increase the amount of fuel in the mixture to compensate for the decrease in pressure and density of the air.
2. If the ground wire between the magneto and the ignition switch becomes disconnected, the engine
 - a. will not operate on one magneto.
 - b. cannot be started with the switch in the on position.
 - c. could accidentally start if the propeller is moved with fuel in the cylinder.
3. If the grade of fuel used in an aircraft engine is lower than specified for the engine, it will most likely cause
 - a. a mixture of fuel and air that is not uniform in all cylinders.
 - b. lower cylinder head temperatures.
 - c. detonation.

4. On aircraft equipped with fuel pumps, when is the auxiliary electric driven pump used?
 - a. In the event engine-driven fuel pump fails.
 - b. All the time to aid the engine-driven fuel pump.
 - c. Constantly except in starting the engine.
5. A precaution for the operation of an engine equipped with a constant-speed propeller is to
 - a. avoid high RPM settings with high manifold pressure.
 - b. avoid high manifold pressure settings with low RPM.
 - c. always use a rich mixture with high RPM settings.

Stage 1 | Lesson 7 - Aircraft Flight Instruments - Pitot-Static

Required Reading: FAA 8083-25B (PHAK) {Chapters 7}

Suggested Videos:

- [Pitot-Static Instruments](#)

FAA Exam Prep Questions:

1. If the pitot tube and outside static vents become clogged, which instruments would be affected?
 - a. The altimeter, airspeed indicator, and turn-and-slip indicator.
 - b. The altimeter, airspeed indicator, and vertical speed indicator.
 - c. The altimeter, attitude indicator, and turn-and-slip indicator.
2. Which instrument will become inoperative if the pitot tube becomes clogged?
 - a. Altimeter.
 - b. Vertical speed.
 - c. Airspeed.
3. (Refer to Figure 3.) Altimeter 2 indicates
 - a. 1,500 feet.
 - b. 4,500 feet.
 - c. 14,500 feet.
4. How do variations in temperature affect the altimeter?
 - a. Pressure levels are raised on warm days and the indicated altitude is lower than true altitude.
 - b. Higher temperatures expand the pressure levels and the indicated altitude is higher than true altitude.
 - c. Lower temperatures lower the pressure levels and the indicated altitude is lower than true altitude.
5. What is true altitude?
 - a. The vertical distance of the aircraft above sea level.
 - b. The vertical distance of the aircraft above the surface.
 - c. The height above the standard datum plane.

Stage 1 | Lesson 8 - Aircraft Flight Instruments - Gyroscopic, Compass, and Modern Avionics

Required Reading: FAA 8083-25B (PHAK) {Chapters 7}

Suggested Videos:

- [Gyroscopic Instruments](#)
- [Magnetic Compass](#)
- [Modern Avionics - G1000](#)

FAA Exam Prep Questions:

1. (Refer to Figure 7.) The proper adjustment to make on the attitude indicator during level flight is to align the
 - a. horizon bar to the level-flight indication.
 - b. horizon bar to the miniature airplane.
 - c. miniature airplane to the horizon bar.
2. (Refer to Figure 5.) A turn coordinator provides an indication of the
 - a. movement of the aircraft about the yaw and roll axes.
 - b. angle of bank up to but not exceeding 30°.
 - c. attitude of the aircraft with reference to the longitudinal axis
3. (Refer to Figure 6.) To receive accurate indications during flight from a heading indicator, the instrument must be
 - a. set prior to flight on a known heading.
 - b. calibrated on a compass rose at regular intervals.
 - c. periodically realigned with the magnetic compass as the gyro precesses.
4. In the Northern Hemisphere, a magnetic compass will normally indicate initially a turn toward the west if
 - a. a left turn is entered from a north heading.
 - b. a right turn is entered from a north heading.
 - c. an aircraft is accelerated while on a north heading.
5. In the Northern Hemisphere, the magnetic compass will normally indicate a turn toward the south when
 - a. a left turn is entered from an east heading.
 - b. a right turn is entered from a west heading.
 - c. the aircraft is decelerated while on a west heading.

Stage 1 | Lesson 9 - Aircraft Documents and Maintenance (Quiz)

Required Reading: FAA 8083-25B (PHAK) {Chapters 9}

Suggested Videos:

- [Aircraft Documents A.R.R.O.W.](#)
- [Inspections for Aircraft A.V.1.A.T.E. S](#)
- [Required Inspections and Airplane Logbook Information](#)
- [Airworthiness Directives and Special Airworthiness Information Bulletins](#)
- [Purpose and Procedure for Obtaining a Special Flight Permit](#)
- [Inoperative Equipment Discovered Prior to Flight](#)
- [Flying with Inoperative Equipment](#)
- [How to review aircraft maintenance records](#)
- [100 Hour Inspections](#)
- [Airplane POH](#)

FAA Exam Prep Questions:

1. Preventive maintenance has been performed on an aircraft. What paperwork is required?
 - a. A full, detailed description of the work done must be entered in the airframe logbook.
 - b. The date the work was completed, and the name of the person who did the work must be entered in the airframe and engine logbook.
 - c. The signature, certificate number, and kind of certificate held by the person approving the work and a description of the work must be entered in the aircraft maintenance records.
2. The responsibility for ensuring that maintenance personnel make the appropriate entries in the aircraft maintenance records indicating the aircraft has been approved for return to service lies with the
 - a. owner or operator.
 - b. pilot in command.
 - c. mechanic who performed the work.
3. When are non-rechargeable batteries of an emergency locator transmitter (ELT) required to be replaced?
 - a. Every 24 months.
 - b. When 50 percent of their useful life expires.
 - c. At the time of each 100-hour or annual inspection.
4. An aircraft's annual inspection was performed on July 12, this year. The next annual inspection will be due no later than
 - a. July 1, next year.
 - b. July 13, next year.
 - c. July 31, next year.
5. What aircraft inspections are required for rental aircraft that are also used for flight instruction?
 - a. Annual and 100-hour inspections.
 - b. Biannual and 100-hour inspections.
 - c. Annual and 50-hour inspections

Stage 1 | Lesson 10 - Weight and Balance

Required Reading: FAA 8083-25B (PHAK) {Chapters 10}

Suggested Videos:

- [Complete Guide to Weight and Balance](#)
- [Aircraft Weight and Balance In Plain English](#)
- [Calculating Weight and Balance](#)

FAA Exam Prep Questions:

1. Center of gravity can be found by
 - a. multiplying weight times arm.
 - b. dividing total weight by total moment.
 - c. dividing total moment by total weight.

2. In weight and balance calculations, arm is
 - a. the distance between items.
 - b. the distance from the datum line to the item.
 - c. weight times moment.
3. (Refer to Figures 32 and 33.) Upon landing, the front passenger (180 pounds) departs the airplane. A rear passenger (204 pounds) moves to the front passenger position. What effect does this have on the CG if the airplane weighed 2,690 pounds and the MOM/100 was 2,260 just prior to the passenger transfer?
 - a. The CG moves forward approximately 3 inches.
 - b. The weight changes, but the CG is not affected.
 - c. The CG moves forward approximately 0.1 inch.
4. An aircraft is loaded 110 pounds over maximum certificated gross weight. If fuel (gasoline) is drained to bring the aircraft weight within limits, how much fuel should be drained?
 - a. 15.7 gallons.
 - b. 16.2 gallons.
 - c. 18.4 gallons.
5. (Refer to Figure 34.) Calculate the moment of the airplane and determine which category is applicable.

	WEIGHT (LB)	MOM/1000
Empty weight	1,350	51.5
Pilot and front passenger	310	---
Rear passengers	96	---
Fuel, 38 gal	---	---
Oil, 8 qt	---	-0.2

- a. 79.2, utility category.
- b. 80.8, utility category.
- c. 81.2, normal category.

Stage 1 | Lesson 11 - Aircraft Performance Charts

Required Reading: FAA 8083-25B (PHAK) {Chapter 11}; Training Aircraft POH/PIM/AFM

Suggested Videos:

- [Aircraft Performance and Limitations](#)
- [Aircraft Performance EXPLAINED](#)
- [Using a Cruise Performance Chart](#)

FAA Exam Prep Questions:

1. It's a warm summer day and you are planning a flight through a mountain pass at 11,500 feet MSL. Your aircraft's service ceiling is 14,000 feet. You have calculated the density altitude through the mountain pass will be 14,800 feet. An appropriate course of action would be?
 - a. Density altitude only matters for takeoff and landing. Proceed as planned.
 - b. Change your flight plan route so that you do not exceed the service ceiling of the aircraft.
 - c. Proceed as planned as the warm air will help you get the extra elevation need to cross through the pass.
2. (Refer to Figure 40.) Determine the approximate ground roll distance required for takeoff.

OAT.....32 °C
Pressure altitude.....2,000 ft
Takeoff weight.....2,500 lb
Headwind component.....20 kts

 - a. 650 feet.
 - b. 850 feet.
 - c. 1,000 feet.
3. (Refer to Figure 37.) Determine the approximate total distance required to land over a 50-foot obstacle.

OAT.....90 °F
Pressure altitude.....4,000 ft
Weight.....2,800 lbs
Headwind component.....10 kts

 - a. 1,525 feet.
 - b. 1,950 feet.
 - c. 1,775 feet.
4. (Refer to Figure 36.) What is the maximum wind velocity for a 30° crosswind if the maximum crosswind component for the airplane is 12 knots?
 - a. 16 knots.
 - b. 20 knots.
 - c. 24 knots.
5. Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?
 - a. Low temperature, low relative humidity, and low density altitude.
 - b. High temperature, low relative humidity, and low density altitude.
 - c. High temperature, high relative humidity, and high density altitude.

Stage 1 | Lesson 12 - Airport Operations - Data, Signs, Markings, and Lighting

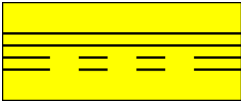
Required Reading: FAA 8083-25B (PHAK) {Chapter 14}; FAA 8083-3C (AFH) {Chapter 2 and 8}

Suggested Videos:

- [Airport Signage](#)
- [Airport Lighting](#)
- [Airport Markings](#)

- [NOTAMs](#)

FAA Exam Prep Questions:

1. (Refer to Figure 49.) If the wind is as shown by the landing direction indicator, the pilot should land on
 - a. Runway 18 and expect a crosswind from the right.
 - b. Runway 22 directly into the wind.
 - c. Runway 36 and expect a crosswind from the right.
2. From the cockpit, this marking confirms the aircraft to be
 
 - a. on a taxiway, about to enter runway zone.
 - b. on a runway, about to clear.
 - c. near an instrument approach clearance zone.
3. What does the outbound destination sign identify?
 - a. Identifies entrance to the runway from a taxiway.
 - b. Identifies runway on which an aircraft is located.
 - c. Identifies direction to take-off runways.
4. (Refer to Figure 47.) While on final approach to a runway equipped with a standard 2-bar VASI, the lights appear as shown by illustration D. This means that the aircraft is
 - a. above the glide slope.
 - b. below the glide slope.
 - c. on the glide slope.
5. Airport taxiway edge lights are identified at night by
 - a. white directional lights.
 - b. blue omnidirectional lights.
 - c. alternate red and green lights.

Stage 1 | Lesson 13 - Airport Operations - Traffic Pattern and ATC

Required Reading: FAA 8083-25B (PHAK) {Chapter 14}; FAA 8083-3C (AFH) {Chapter 2 and 8}

Suggested Videos:

- [Wake Turbulence Avoidance](#)
- [Traffic Patterns](#)
- [Traffic Patterns - Lesson 2](#)
- [Collision Avoidance Precautions](#)
- [Taxiing Lesson 1](#)
- [Taxiing Lesson 2](#)
- [Radio Communication and ATC](#)
- [Radio Communication and ATC 2](#)

FAA Exam Prep Questions:

1. Refer to Figure 49.) Select the proper traffic pattern and runway for landing.
 - a. Left-hand traffic and Runway 18.
 - b. Right-hand traffic and Runway 18.
 - c. Left-hand traffic and Runway 22.

2. Which runway and traffic pattern should be used as indicated by the wind cone in the segmented circle?
 - a. Right-hand traffic on Runway 9.
 - b. Right-hand traffic on Runway 18.
 - c. Left-hand traffic on Runway 36.
3. Basic radar service in the terminal radar program is best described as
 - a. safety alerts, traffic advisories, and limited vectoring to VFR aircraft.
 - b. mandatory radar service provided by the Automated Radar Terminal System (ARTS) program.
 - c. wind-shear warning at participating airports.
4. When approaching taxiway holding lines from the side with the continuous lines, the pilot
 - a. may continue taxiing.
 - b. should not cross the lines without ATC clearance.
 - c. should continue taxiing until all parts of the aircraft have crossed the lines.
5. Automatic Terminal Information Service (ATIS) is the continuous broadcast of recorded information concerning
 - a. pilots of radar-identified aircraft whose aircraft is in dangerous proximity to terrain or to an obstruction.
 - b. nonessential information to reduce frequency congestion.
 - c. noncontrol information in selected high-activity terminal areas.

Stage 1 | Lesson 14 - Federal Aviation Regulations (FARs) / AIM

Required Reading: FAR/AIM

Suggested Videos:

- [FAA Regulations \(FARs\)](#)
- [FAA Legal Interpretations](#)
- [Regulations Private Pilot Exam prep](#)

FAA Exam Prep Questions:

1. According to regulations pertaining to privileges and limitations, a private pilot may
 - a. not pay less than the pro rata share of the operating expenses of a flight with passengers provided the expenses involve only fuel, oil, airport expenditures, or rental fees.
 - b. not be paid in any manner for the operating expenses of a flight.
 - c. be paid for the operating expenses of a flight if at least three takeoffs and three landings were made by the pilot within the preceding 90 days.
2. Unless otherwise authorized, what is the maximum indicated airspeed at which a person may operate an aircraft below 10,000 feet MSL?
 - a. 200 knots.
 - b. 250 knots.
 - c. 288 knots.

3. What document(s) must be in your personal possession or readily accessible in the aircraft while operating as pilot in command of an aircraft?
 - a. A pilot certificate with an endorsement showing accomplishment of an annual flight review and a pilot logbook showing recency of experience.
 - b. Certificates showing accomplishment of a checkout in the aircraft and a current biennial flight review.
 - c. An appropriate pilot certificate and an appropriate current medical certificate if required.
4. In addition to other preflight actions for a VFR flight away from the vicinity of the departure airport, regulations specifically require the pilot in command to
 - a. review traffic control light signal procedures.
 - b. check the accuracy of the navigation equipment and the emergency locator transmitter (ELT).
 - c. determine runway lengths at airports of intended use and the aircraft's takeoff and landing distance data.
5. A Third-Class Medical Certificate is issued to a 51-year-old pilot on May 3, this year. To exercise the privileges of a Private Pilot Certificate, the medical certificate will be valid until midnight on
 - a. May 3, 1 year later.
 - b. May 31, 1 year later.
 - c. May 31, 2 years later.

Stage 2 | Lesson 16 – Weather Theory - Structure and Global Wind Patterns

Required Reading: FAA 8083-25B (PHAK) {Chapter 12}; FAA AIM; FAA 8082-28 (AWH) {Chapter 4, 8, 9, 10, 16, 17}

Suggested Videos:

- [Basic Weather Theory](#)
- [Weather for Pilots - 01 - Layers of the Atmosphere](#)
- [Aviation Weather](#)

FAA Exam Prep Questions:

1. Which weather conditions should be expected beneath a low-level temperature inversion layer when the relative humidity is high?
 - a. Smooth air, poor visibility, fog, haze, or low clouds.
 - b. Light wind shear, poor visibility, haze, and light rain.
 - c. Turbulent air, poor visibility, fog, low stratus type clouds, and showery precipitation.
2. Earth's atmosphere is composed of;
 - a. 78% Nitrogen, 21% Oxygen, 1% other gases
 - b. 21% Nitrogen, 1% oxygen, 78% other gases
 - c. Even % of Nitrogen, Oxygen, and Carbon Dioxide
3. Every physical process of weather is accompanied by, or is the result of, a
 - a. movement of air.
 - b. pressure differential
 - c. heat exchange.

4. What is meant by the term "dewpoint"?
 - a. The temperature at which condensation and evaporation are equal.
 - b. The temperature at which dew will always form.
 - c. The temperature to which air must be cooled to become saturated.
5. When there is a temperature inversion, you would expect to experience?
 - a. Clouds with extensive vertical development above an inversion aloft.
 - b. Good visibility in the lower levels of the atmosphere and poor visibility above an inversion aloft.
 - c. An increase in temperature as altitude is increased.

Stage 2 | Lesson 17 – Weather Theory - Stability and Saturation

Required Reading: FAA 8083-25B (PHAK) {Chapter 12}; FAA AIM; FAA 8082-28 (AWH) {Chapter 4, 8, 9, 10, 16, 17}

Suggested Videos:

- [Weather for Pilots - 03 - Stability & Hazards](#)
- [Clouds & Moisture Basics](#)
- [Air Masses and Stability](#)
- [Fog for Aviators](#)

FAA Exam Prep Questions:

1. When warm, moist, stable air flows upslope, it
 - a. produces stratus type clouds.
 - b. causes showers and thunderstorms.
 - c. develops convective turbulence.
2. At approximately what altitude above the surface would the pilot expect the base of cumuliform clouds if the surface air temperature is 82 °F and the dewpoint is 38 °F?
 - a. 9,000 feet AGL.
 - b. 10,000 feet AGL.
 - c. 11,000 feet AGL.
3. What are the standard temperature and pressure values for sea level?
 - a. 15 °C and 29.92 inches Hg.
 - b. 59 °C and 1013.2 millibars.
 - c. 59 °F and 29.92 millibars.
4. The wind at 5,000 feet AGL is southwesterly while the surface wind is southerly. This difference in direction is primarily due to
 - a. stronger pressure gradient at higher altitudes.
 - b. friction between the wind and the surface.
 - c. stronger Coriolis force at the surface.
5. Crests of standing mountain waves may be marked by stationary, lens-shaped clouds known as
 - a. mammatocumulus clouds.
 - b. standing lenticular clouds.
 - c. roll clouds.

Stage 2 | Lesson 18 – Weather Theory - Air Masses and Hazards

Required Reading: FAA 8083-25B (PHAK) {Chapter 12}; FAA AIM; FAA 8082-28 (AWH) {Chapter 11, 15, 18, 19, 20, 21, 22}

Suggested Videos:

- [Weather for Pilots - 02 - Air Masses and Fronts](#)
- [Turbulence \(Weather Theory\)](#)
- [Ask ATC: Thunderstorms](#)
- [Understanding Thunderstorms](#)
- [The Do's and Don'ts of Avoiding Thunderstorms](#)
- [Weather Radar](#)

FAA Exam Prep Questions:

1. What feature is normally associated with the cumulus stage of a thunderstorm?
 - a. Roll cloud.
 - b. Continuous updraft.
 - c. Frequent lightning.
2. During the life cycle of a thunderstorm, which stage is characterized predominately by downdrafts?
 - a. Cumulus.
 - b. Dissipating.
 - c. Mature.
3. If there is thunderstorm activity in the vicinity of an airport at which you plan to land, which hazardous atmospheric phenomenon might be expected on the landing approach?
 - a. Precipitation static.
 - b. Wind-shear turbulence.
 - c. Steady rain.
4. When may hazardous wind shear be expected?
 - a. When stable air crosses a mountain barrier where it tends to flow in layers forming lenticular clouds.
 - b. In areas of low-level temperature inversion, frontal zones, and clear air turbulence.
 - c. Following frontal passage when stratocumulus clouds form indicating mechanical mixing.
5. One in-flight condition necessary for structural icing to form is
 - a. small temperature/dewpoint spread.
 - b. stratiform clouds.
 - c. visible moisture.

Stage 2 | Lesson 19 – Weather Products

Required Reading: FAA 8083-25B (PHAK) {Chapter 12}; FAA AIM; FAA 8082-28 (AWH) {2, 3, 24, 25, 26, 27, 28}

Suggested Videos:

- [Weather for Pilots - 04 - Introduction to Weather Products](#)
- [Weather for Pilots - 05 - Go No Go Decision](#)
- [Weather ADM](#)
- [Aviation Weather Center Update 2023](#)
- [Breaking the WEATHER CODE!](#)
- [ForeFlight Weather Planning](#)

FAA Exam Prep Questions:

1. Which type of weather briefing should a pilot request to supplement mass disseminated data?
 - a. An outlook briefing.
 - b. A supplemental briefing.
 - c. An abbreviated briefing.
2. When speaking to a flight service weather briefer, you should state
 - a. the pilot in command's full name and address.
 - b. a summary of your qualifications.
 - c. whether the flight is VFR or IFR.
3. Refer to Figure 15.) In the TAF from KOKC, the clear sky becomes
 - a. overcast at 2,000 feet during the forecast period between 2200Z and 2400Z.
 - b. overcast at 200 feet with a 40 percent probability of becoming overcast at 600 feet during the forecast period between 2200Z and 2400Z.
 - c. overcast at 200 feet with the probability of becoming overcast at 400 feet during the forecast period between 2200Z and 2400Z.
4. Graphical Forecasts for Aviation (GFA) are weather charts best used to
 - a. plan a flight within 5 miles of your home airport.
 - b. learn the forecast weather along your proposed route of flight as well as at your destination if it has no terminal forecast.
 - c. learn the reported surface conditions of the airports along your route of flight.
5. SIGMET's are issued as a warning of weather conditions hazardous to which aircraft?
 - a. Small aircraft only.
 - b. Large aircraft only.
 - c. All aircraft.

Stage 2 | Lesson 20 – National Airspace System

Required Reading: FAA 8083-25B (PHAK) {Chapter 15}; FAA AIM

Suggested Videos:

- [Airspace - Lesson 1](#)
- [Airspace - Lesson 2](#)
- [VFR Weather Minimums](#)

FAA Exam Prep Questions:

1. Outside controlled airspace, the minimum flight visibility requirement for VFR flight above 1,200 feet AGL and below 10,000 feet MSL during daylight hours is
 - a. 1 mile.
 - b. 3 miles.
 - c. 5 miles.
2. (Refer to Figure 25, area 4.) The airspace directly overlying Fort Worth Meacham is
 - a. Class B airspace to 10,000 feet MSL.
 - b. Class C airspace to 5,000 feet MSL.
 - c. Class D airspace to 3,200 feet MSL.
3. (Refer to Figure 22.) What are the visibility and cloud clearance requirements in an airplane at night when conducting takeoffs and landings at Shoshone County Airport (Area 3) if the pattern altitude is 1,000 feet AGL?
 - a. 3 SM visibility and clear of clouds.
 - b. 1 SM visibility and clear of clouds if remaining within one-half mile of the airport.
 - c. Remain clear of clouds and operate at a speed that allows adequate opportunity to see other traffic and obstructions in time to avoid a collision.
4. What minimum pilot certification is required for operation within Class B airspace?
 - a. Recreational Pilot Certificate.
 - b. Private Pilot Certificate or Student Pilot Certificate with appropriate logbook endorsements.
 - c. Private Pilot Certificate with an instrument rating.
5. What action should a pilot take when operating under VFR in a Military Operations Area (MOA)?
 - a. Obtain a clearance from the controlling agency prior to entering the MOA.
 - b. Operate only on the airways that transverse the MOA.
 - c. Exercise extreme caution when military activity is being conducted.

Stage 2 | Lesson 21 – Sectional Charts and Associated Publications

Required Reading: VFR Sectional Chart and VFR Terminal Area Chart; FAA Aeronautical Chart User Guide

Suggested Videos:

- [How To Read A VFR Sectional Chart](#)
- [Chart Supplement](#)

FAA Exam Prep Questions:

1. Refer to Figure 27.) An aircraft departs an airport in the mountain standard time zone at 1615 MST for a 2-hour 15-minute flight to an airport located in the Pacific standard time zone. The estimated time of arrival at the destination airport should be
 - a. 1630 PST.
 - b. 1730 PST.
 - c. 1830 PST.
2. (Refer to Figure 23.) The flag symbols at Statesboro Bulloch County Airport, Claxton-Evans County Airport, and Ridgeland Airport are
 - a. outer boundaries of Savannah Class C airspace.

- b. airports with special traffic patterns.
 - c. visual checkpoints to identify position for initial callup prior to entering Savannah Class C airspace.
3. (Refer to Figure 25, area 2.) The control tower frequency for Addison Airport is
 - a. 122.95 MHz.
 - b. 126.0 MHz.
 - c. 133.4 MHz.
 4. (Refer to Figure 24, area 2.) What minimum altitude is necessary to vertically clear the obstacle on the southeast side of Winnsboro Airport by 500 feet?
 - a. 823 feet MSL.
 - b. 1,013 feet MSL.
 - c. 1,403 feet MSL.
 5. (Refer to Figure 21, area 3.) Which airport is located at approximately 47°21'N latitude and 101°01'W longitude?
 - a. Underwood.
 - b. Evenson.
 - c. Washburn.

Stage 2 | Lesson 22 – Electronic (VOR) Navigation

Required Reading: FAA 8083-25B (PHAK) {Chapter 16}; FAA AIM

Suggested Videos:

- [Navigation Systems](#)
- [Ridiculously easy VOR Navigation!](#)
- [VOR Navigation is Simple... Right?](#)

FAA Exam Prep Questions:

1. (Refer to Figure 21.) What course should be selected on the omnibearing selector (OBS) to make a direct flight from Mercer County Regional Airport (area 3) to the Minot VORTAC (area 1) with a TO indication?
 - a. 359°.
 - b. 179°.
 - c. 001°.
2. (Refer to Figure 24.) What is the approximate position of the aircraft if the VOR receivers indicate the 245° radial of Sulphur Springs VOR-DME (area 5) and the 145° radial of Bonham VORTAC (area 3)?
 - a. Meadowview Airport.
 - b. Glenmar Airport.
 - c. Majors Airport.
3. A VORTAC station is represented by
 - a. A single dot inside a square.
 - b. A single dot inside a hexagon.
 - c. A single dot inside a hexagon with tabs on three of the sides.

4. When using a VOT to make a VOR receiver check, the CDI should be centered and the OBS should indicate that the aircraft is on the
 - a. 090 degree radial with a FROM indication.
 - b. 180 degree radial with a FROM indication.
 - c. 360 degree radial with a FROM indication.
5. (Refer to Figures 24 and 28.) The VOR is tuned to Bonham VORTAC (area 3), and the aircraft is positioned over the town of Sulphur Springs (area 5). Which VOR indication is correct?
 - a. 1.
 - b. 7.
 - c. 8.

Stage 2 | Lesson 23 – Electronic (GPS) and Visual Navigation

Required Reading: FAA 8083-25B (PHAK) {Chapter 16}; FAA AIM

Suggested Videos:

- [Pilotage and Dead Reckoning](#)
- [Pilotage and Dead Reckoning Example In-Flight](#)
- [How does GPS work](#)
- [WAAS](#)
- [RAIM](#)

FAA Exam Prep Questions:

1. Can a GPS be used as an altimeter?
 - a. No, there can be too many errors in the vertical height computations of the GPS to rely on it as an altimeter.
 - b. Yes, but only if a barometric altimeter is available as a backup.
 - c. Yes.
2. Which of the following are suitable navigation waypoints?
 - a. VFR Checkpoints
 - b. Federal Airways
 - c. LORAN
3. If Receiver Autonomous Integrity Monitoring (RAIM) capability is lost in-flight,
 - a. the pilot may still rely on GPS derived altitude for vertical information.
 - b. the pilot has no assurance of the accuracy of the GPS position.
 - c. GPS position is reliable provided at least 3 GPS satellites are available.
4. How many satellites make up the Global Positioning System (GPS)?
 - a. 25.
 - b. 22.
 - c. 24.
5. Which of the following is a form of visual navigation?
 - a. Dead Reckoning
 - b. VORTAC
 - c. Pilotage

Stage 2 | Lesson 24 - Cross-Country Flight Planning (Quiz)

Required Reading: Cross-Country Planning Equipment; Training Aircraft POH/PIM/AFM

Suggested Videos:

- [Cross Country Flight Planning Step by Step](#)
- [VFR Flight Planning Tutorial](#)
- [Cross-country flight planning with an iPad](#)
- [True Course vs True Heading vs Magnetic Heading](#)
- [Choosing VFR Cruising Altitudes](#)

FAA Exam Prep Questions:

1. (Refer to Figure 21.) What is the estimated time en route from Mercer County Regional Airport (area 3) to Minot International (area 1)? The wind is from 330° at 25 knots and the true airspeed is 100 knots. Add 3-1/2 minutes for departure and climb-out.
 - a. 44 minutes.
 - b. 48 minutes.
 - c. 52 minutes.
2. (Refer to Figure 22.) Determine the magnetic heading for a flight from Sandpoint Airport (area 1) to St. Maries Airport (area 4). The wind is from 215° at 25 knots and the true airspeed is 125 knots.
 - a. 352° .
 - b. 172° .
 - c. 187° .
3. How fast are you flying if you travel 2 miles in 1 minute?
 - a. 30 miles per hour.
 - b. 60 miles per hour.
 - c. 120 miles per hour.
4. The angular difference between true north and magnetic north is
 - a. magnetic deviation.
 - b. magnetic variation.
 - c. compass acceleration error.
5. How far will an aircraft travel in 7.5 minutes with a groundspeed of 114 knots?
 - a. 14.25 NM.
 - b. 15.00 NM.
 - c. 14.50 NM.

Stage 2 | Lesson 25 - Night Flying

Required Reading: FAA 8083-3C (AFH) {Chapter 11}; FAA AIM

Suggested Videos:

- [Intro to flying at night](#)
- [Airport Lighting At Night](#)
- [LEARN NIGHT FLYING - 3 Flight Instruction Tips.](#)
- [FAA 3 Definitions of Nighttime](#)

FAA Exam Prep Questions:

1. What preparation should a pilot make to adapt the eyes for night flying?
 - a. Wear sunglasses after sunset until ready for flight.
 - b. Avoid red lights at least 30 minutes before the flight.
 - c. Avoid bright white lights at least 30 minutes before the flight.
2. The definition of nighttime is
 - a. sunset to sunrise.
 - b. 1 hour after sunset to 1 hour before sunrise.
 - c. the time between the end of evening civil twilight and the beginning of morning civil twilight.
3. What is the specific fuel requirement for flight under VFR at night in an airplane?
 - a. Enough to complete the flight at normal cruising speed with adverse wind conditions.
 - b. Enough to fly to the first point of intended landing and to fly after that for 30 minutes at normal cruising speed.
 - c. Enough to fly to the first point of intended landing and to fly after that for 45 minutes at normal cruising speed.
4. During a night flight, you observe steady red and green lights ahead and at the same altitude. What is the general direction of movement of the other aircraft?
 - a. The other aircraft is crossing to the left.
 - b. The other aircraft is flying away from you.
 - c. The other aircraft is approaching head-on.
5. How can a military airport be identified at night?
 - a. Alternate green and white flashes.
 - b. Dual peaked (two quick) white flashes between green flashes.
 - c. White flashing lights with steady green at the same location.

Stage 2 | Lesson 26 - Aeronautical Decision Making (ADM)

Required Reading: FAA 8083-25B (PHAK) {Chapter 2}

Suggested Videos:

- [FAAST Team Aeronautical Decision Making](#)
- [PAVE Model](#)
- [Accident Case Study: Hazardous Attitudes](#)
- [Risk-Based Aeronautical Decision Making](#)
- [NTSB Making the Right Decisions](#)

FAA Exam Prep Questions:

1. Hazardous attitudes occur to every pilot to some degree at some time. What are some of these hazardous attitudes?
 - a. Poor risk management and lack of stress management.
 - b. Antiauthority, impulsivity, macho, resignation, and invulnerability.
 - c. Poor situational awareness, snap judgments, and lack of a decision making process.

2. What is the antidote when a pilot has a hazardous attitude, such as "Invulnerability"?
 - a. It will not happen to me.
 - b. It can not be that bad.
 - c. It could happen to me.
3. In the aeronautical decision making (ADM) process, what is the first step in neutralizing a hazardous attitude?
 - a. Making a rational judgment.
 - b. Recognizing hazardous thoughts.
 - c. Recognizing the invulnerability of the situation.
4. Risk management, as part of the aeronautical decision making (ADM) process, relies on which features to reduce the risks associated with each flight?
 - a. Application of stress management and risk element procedures.
 - b. Situational awareness, problem recognition, and good judgment.
 - c. The mental process of analyzing all information in a particular situation and making a timely decision on what action to take.
5. What is the antidote when a pilot has a hazardous attitude, such as "Macho"?
 - a. I can do it.
 - b. Taking chances is foolish.
 - c. Nothing will happen.

Stage 2 | Lesson 27 - Aeromedical and Human Factors

Required Reading: FAA 8083-25B (PHAK) {Chapter 17}

Suggested Videos:

- [Aeromedical Factors](#)
- [Hypoxia - 4 of spades](#)
- [Pilot Declares Emergency Because Of Extreme Hypoxia](#)
- [178 Seconds to Live](#)

FAA Exam Prep Questions:

1. A lack of orientation with regard to the position, attitude, or movement of the aircraft in space is defined as
 - a. spatial disorientation.
 - b. hyperventilation.
 - c. hypoxia.
2. A pilot should be able to overcome the symptoms or avoid future occurrences of hyperventilation by
 - a. closely monitoring the flight instruments to control the airplane.
 - b. slowing the breathing rate, breathing into a bag, or talking aloud.
 - c. increasing the breathing rate in order to increase lung ventilation.
3. Which statement best defines hypoxia?
 - a. A state of oxygen deficiency in the body.
 - b. An abnormal increase in the volume of air breathed.
 - c. A condition of gas bubble formation around the joints or muscles.

4. Large accumulations of carbon monoxide in the human body result in
 - a. tightness across the forehead.
 - b. loss of muscular power.
 - c. an increased sense of well-being.
5. A state of temporary confusion resulting from misleading information being sent to the brain by various sensory organs is defined as
 - a. spatial disorientation.
 - b. hyperventilation.
 - c. hypoxia.