Private Pilot Oral Exam
Answers

Airworthiness Certificate
Registration Certificate
Owner's manual or operating limitations
Weight & Balance Data

The Airworthiness Certificate is issued by the FAA after being inspected and found in safe condition. It remains in effect as long as it receives the required maintenance and is properly registered in the U.S.A. Some of the required maintenance and inspections are:

Annual Inspection	12 months	Keep in log books
100 HR	For hire / Rental	Keep in log books
Pitot Static System	24 months	Keep in log books
Altimeter	24 months	Keep in log books
Transponder	24 months	Keep in log books
ELT Inspection	12 months	Keep in log books
VOR Check	30 Days	Keep in Airplane for IFR

A.D. (Airworthiness Directive) is what the FAA uses to notify aircraft owners about unsafe conditions and specify the conditions under which the product may continue to be operated. The records on A.D.'s are kept in the log book and show status, method of compliance and who did the work.

REQUIED EQUIPMENT FOR **DAY VFR**

Airspeed Indicator	Altimeter
Compass	Tachometer
Oil Pressure	Oil Temperature
Fuel	Safety Belts

Rotating Beacon or Anti Collision light

*Decathlon must have a manifold pressure gauge

To get a Ferry Permit, contact the local FSDO or a Designated Airworthiness Representative can assist and supply forms. Reasons for needing one:

Flying to get repaired	Delivering
Flight testing new aircraft	Evacuating Aircraft from Disaster

A Private Pilot must carry with him:

A Valid Pilot Certificate Photo ID Current Medical Certificate.

To stay current he/she must have accomplished a flight review in the preceding 24 months. To carry passengers he/she must make 3 takeoff and landings in the last 90 days. They must be to a full stop in a tail wheel airplane. They must be made at night if your operation will be from one hour after sunset to one hour before sunrise.

PRIVILEGES AND LIMITATIONS

- A Private pilot cannot act as PIC (Pilot in Command) for compensation or hire, or carry passengers or property for compensation or hire.
- You may not pay less than your share of the expenses of the flight.
- A Pilot can be reimbursed for search operations.
- You can give rides for a charity if you follow the rules in 61.113
- You may demonstrate an airplane to a buyer if you 200 hours.
- You can act as a tow pilot for gliders with some training and 100 hours PIC time.
- Your medical is good for 3years. After your 40th birthday it is good for 2 years.

METAR (Aviation Routine Weather Report): Is observed weather, now or a short time in the past. A METAR report includes:

The airport identifier - Time of observation – Wind – Visibility - Runway Visual Range - Present Weather Phenomena - Sky Conditions - Temperature / Dew Point - Altimeter Setting
This is current weather, this is not a forecast.

TAF (Terminal Aerodrome Forecast): This is a statement of expected weather conditions for a specified time period within 5 miles of the airport. It is for a 24 hour period. No observed weather, only a forecast, and only out to 24 hour from when it was made.

FA (Area Forecast): These will provide an overview of regional weather conditions. (over many states). There is information for VFR / MVFR clouds & weather for a 12-18 hour forecast period. Use the FA with the AIRMETs and SIGMETs to get a complete weather picture. This is only a forecast.

FB (Winds & Temperature Aloft Forecast): This is a forecast for wind direction, speed and temperature at specified times, altitudes and locations. This is only a forecast.

PROG CHARTS (Short-Range surface prognostic charts): These provide a forecast of surface pressure systems, fronts and precipitation for a 2-day period. There are 4 forecast periods, 12, 24, 36, 48 hours. By using all 4 charts you can obtain an overview of the progression of surface weather features during the next 48 hours. This is only a forecast.

SURFACE ANALYSIS CHARTS: This is the current weather map. This is made from surface weather observations. This chart depicts highs, lows, ridges, troughs, the location and character of fronts, and isobars. This is weather now or a short time in the past. This is current weather not a forecast.

RADAR SUMMARY CHART (These are made from radar weather reports): It has possible precipitation types, cell movements, maximum tops, locations of lines of echoes, and remarks are plotted on this chart. Severe thunderstorm and tornado watches are plotted if they are in effect. This is updated every hour. This is weather now or a short time in the past.

AC (Convective Outlooks): This shows areas of slight risk, moderate risk or high risk of sever thunderstorms for a 24 hour period. There are 2 and 3 day charts also. This is only a forecast.

AWOS (Automated weather observing system): Transmits minute-by-minute weather observations directly to the pilot.

ASOS (automated surface observing system): Minute-by minute observations generating METARS and other aviation weather information, transmitted directly to the pilot.

ATIS (Automatic Terminal Information Service): A continuous broadcast of recorded non-control information in a terminal area. It broadcast essential but routine information to reduce frequency congestion.

FLIGHT WATCH (En-route flight advisory service): Use 122.00 to update your weather briefing in the air, give a pilot report, or open a VFR flight plan.

PIREP (Pilot weather report): Reports from aircraft in flight. Observed actual icing, turbulence, cloud tops, visibility and weather.

There are two types of light-sensitive cells in the eye, the cones and rods.

CONES: Detect color, detail and far away objects. They are useful during the day but are not very effective at night.

RODS: Are for peripheral vision and detect movement. They take about 30 minutes to adjust to darkness and are primary for night vision.

For night flying take the time to let your eyes adjust to the darkness, then avoid bright light, keep the dash lights as dim as possible and view off center.

AIRPORT LIGHTS:

Taxiway light is BLUE.
Runway lights are WHITE then AMBER on the side.
The approach ends are GREEN
Departure ends are RED
Airport Beacon for land is WHITE / GREEN
Airport Beacon for sea is WHITE / YELLOW
Airport beacon for military is WHITE / WHITE / GREEN
Pilot control lights are activated by 3 or 5 or 7 clicks of the mike.

REIL (Runway end identifier lights): A pair of synchronized flashing lights.
VASI: Visual approach slope indicator
PAPI: Precision approach path indicator
VASI and PAPI use RED and WHITE lights to give the pilot a visual glide path, day and night.

POSTION LIGHTS ON THE AIRCRAFT:
Left wing is RED
Right wing is GREEN
Tail facing aft is WHITE

OTHER LIGHTS ON AN AIRCRAFT:
Rotating beacon is RED
Anti-collision light or lights WHITE
Landing and Taxi lights

Bring a flashlight with a white light to pre-flight the airplane and the area around the airplane. Bring a flashlight with a red lens to use on your flight and extra batteries.

Study all weather reports and forecast, with special attention on temperature / dew point spreads to detect the possibility of fog, clouds and ceiling to help select a cruise altitude that will keep you out of them.
Check the lights and charging system of the aircraft.
Check NOTAM's and the Airport Facility Directory to find out about available lighting systems & radio-controlled light system frequencies.

En-route always keep track of your progress, and other airports, in case the weather turns bad or a problem occurs with the aircraft. Use supplemental oxygen above 5000' if it is available. Keep the dash lights as dim as practical; avoid any white light, view off center. If the lights on the ground or in front of you fade out or go out then back on, something is passing in front of you. You may be entering a cloud. Night produces visual illusions like false horizon. Pay closer attention to the gauges.

Flying at night has more demands on the pilot. Emergency landings are more dangerous, spatial disorientation is more likely; distance and altitude are harder to judge. An animal can be on the runway and be impossible to see.

Visibility and cloud clearances for basic VFR in different classes of airspace:

Airspace	Flight Visibility	Distance from Clouds		
A	No VFR	No VFR		
B	3 Miles	Clear of clouds		
C	3 Miles	1000’ above	500’ below	2000’ Horizontal
D	3 Miles	1000’ above	500’ below	2000’ Horizontal
E Less than 10K'	3 Miles	1000’ above	500’ below	2000’ Horizontal
E 10K' or Above	5 Miles	1000’ above	1,000 below	1 Mile
G 1,200' AGL or less Day	1 Miles	Clear of clouds		
G 1,200' AGL or less Night	3 Miles	1000’ above	500’ below	2000’ Horizontal
G Above 1,200' AGL but less than 10K' - Day	1 Miles	1000’ above	500’ below	2000’ Horizontal
G Above 1,200' AGL but less than 10K' - Night	3 Miles	1000’ above	500’ below	2000’ Horizontal
G 1200' AGL above &/or above 10K' MSL	5 Miles	1000’ above	1,000 below	1 Mile

Class Airspace	Entry requirements	Equipment	Minimum Pilot Certificate
A	ATC Clearance	IFR	Instrument Rating
B	ATC Clearance	Two-Way Radio, Transponder with Altitude Reporting Capability	Private - Primary Student - Non Primary
C	Two-Way Radio Communication Prior to Entry	Two-Way Radio, Transponder with Altitude Reporting Capability	No Specific Requirement
D	Two-Way Radio Communication Prior to Entry	Two- Way Radio	No Specific Requirement
E	None for VFR	No Specific Requirement	No Specific Requirement
G	None	No Specific Requirement	No Specific Requirement

A radio call to Grissom, Muncie, or Indy, when answered by them, clears you into their airspace. Chicago must answer you and give you a clearance to enter their airspace.

When the Meteorological conditions are less than those required for basic VFR flight in controlled airspace, a pilot can request and controller can approve special VFR operations. There must be at least one (1) mile visibility and you must remain clear of clouds, day light only, and this is an ATC clearance. One can be issued at night if the pilot and airplane are instrument rated.

MILITARY OPERATION AREAS (MOA)
They are established for separating military training activity from IFR traffic. There is no restriction for a VFR operation in these areas, but be alert when IT'S HOT.

RESTRICTED AREAS
They have hazards to all aircraft. Do not enter a restricted area unless you have permission form the controlling agency.

PROHIBITED AREAS
They are established for security and National Welfare. STAY OUT !
Unless you get permission from the controlling agency. That is unlikely.

TEMPORARY FLIGHT RESTRICTIONS (TFR)
These can pop up with little or no warning.
The President is coming to town, or a Colts game. They can be large or small.
If you enter one you could be escorted to the ground by Military Aircraft.
Flight service can give you information on TFR's.

AIR DEFENSE IDENTIFICATION ZONES (ADIZ)
These have been set up in the vicinity of U.S. and International air space boundaries for aircraft identification prior to entry. For a VFR pilot to enter this air space, he must be on a DVFR flight plan. He must file a flight plan before departure and have an operating two-way radio and a Mode C transponder.

Go over charts, airport signage and the AFD

LIGHT GUN SIGNALS

COLOR AND TYPE OF SIGNAL	(This column not a priority) MOVEMENT OF VEHICLES, EQUIPMENT AND PERSONNEL	AIRCRAFT ON THE GROUND	AIRCRAFT IN FLIGHT
Steady Green	Cleared	Cleared for takeoff	Cleared to land
Flashing Green	N/A	Cleared for taxi	Return for landing 9to be followed by steady green at the proper time
Steady Red	STOP	STOP	Give way to other aircraft & continue circling
Flashing Red	Clear the taxiway/runway	Taxi clear of the runway in use	Airport unsafe, do not land
Flashing White	Return to starting point on airport	Return to starting point on airport	N/A
Alternating Red and Green	Exercise Extreme CAUTION !!!!!!	Exercise Extreme CAUTION !!!!!!	Exercise Extreme CAUTION !!!!!!

HAND PROPPING AN AIRPLANE

Hand propping an airplane is a two man operation.
One person in the plane must be familiar with the controls.
The one pulling on the prop is in charge of all activity.
- He needs firm footing.
- Move the plane if necessary.

Both participants should discuss the procedure and the voice commands.
Do not stand to far from the prop, less than one arms length. (So you do not lean to reach the prop.)
Do not wrap your fingers around the prop. (If it would backfire it could pull you into the prop.)
Do not relocate the prop with the mags on.
Once the engine is running, remember that the prop is almost invisible.
Tie down the tail if there is no one to help you.

Traffic patterns are recommended 600'– 1500' AGL.
Enter a 45^0 to the downwind, (we also use midfield crosswind).
Exit straight out or at a 45^0 turn in the direction of the pattern.
Traffic pattern altitudes and directions are specified in the AFD.

Class D control towers should be called 5-10 miles outside of their airspace.
Get the ATIS first and include it in the initial call.
Read back all instructions.
You can decline a LAHSO clearance.
Have an airport diagram.
Ask for progressive taxi instructions if you are unfamiliar with the airport.
Do not cross hold short lines unless you are cleared to.
Look before crossing runways.
Keep track of other aircraft in or outbound.
Before the run up, turn the airplane so the prop-wash will not blow on the aircraft behind you.
DO NOT program electronics while Taxing?
Keep an eye out for obstacles.
Keep the nose wheel on the center line.
Know airport signage.

PERFORMANCE & LIMITATIONS ARE IN THE OPERATING HANDBOOK, PLACARDS & INSTRUMENT MARKINGS
Locate, use, explain all.

High altitude, high temperature, high humidity, low pressure = High Density Altitude.
The engine will develop less HP, the prop & wings are less efficient. This will cause a longer takeoff roll, slower acceleration and climb, lower service ceiling, longer ground roll on landing.

AIRCRAFT SYSTEMS

FUEL: Min-octane, fuel total, usable fuel, color, number of tanks, number of fuel pumps, number of sumps and locations, vents.

OIL: Number of quarts, maximum and minimum, viscosity, filter, how often you change.

HYDROLIC: Brakes? Flaps? Prop? Gear? Reservoir number and location. How to check levels & operation.

LANDING GEAR: Tricycle or conventional? Fixed or retractable? Spring, Oleo, Bungee? Is the tail-wheel solid or pneumatic?

ENGINE: 4 cylinder, 4 stroke, horizontally opposed, carburetor or fuel injected, air cooled, magnetos, HP, brand.

PROPELLER: Aluminum, fixed pitch or constant speed, brand.

ELECTRICAL: 12V or 24V, alternator or generator, fuses or circuit breakers, Amp gauge, regulator, spare fuses, turn coordinator, lights, radios, starter. NOT the magnetos.

ENVIRONMENTAL: Heater, AC, vents, locate and explain.

FLAPS: Which type of flaps: Fowler, plain, split or slotted?
How operated: Electric, hydraulic or mechanical.
Degrees for each setting.

PITOT-STATIC SYSTEMS:
The airspeed indicator compares the ram air pressure in the pitot tube with the static pressure at the static port.

The vertical speed indicator has a calibrated bleed hole connected to the static port. A change in pressure through the bleed hole will make the needle move up or down.

The altimeter has a diaphragm that changes size with a change in static pressure. When the diaphragm changes size, it will cause the needles to move.

The pitot tube has an electric heating element that is controlled by the pitot heat switch. This is for ice protection.

The pitot static system and the altimeter must be checked every 24 months.

VACUUM:
An engine driven vacuum pump drives the artificial horizon (attitude indicator) and directional gyro (heading indicator).
There is a filter on the inlet and a gauge to measure the vacuum pressure.
A green arc on the gauge will indicate normal operation. If there is no green arc, consult the POH for normal vacuum pressure readings.

DE-ICING / ANTI-ICING: Our airplanes have carburetor heat or alternate air that can be used if the air cleaner ices over.
They also have Pitot heat to keep the air speed indicator working, an alternate static source to keep the static system operating and a defroster to keep the ice off windshield.
There are other systems: Pneumatic boots on the wings and tail, weeping wings, heated props and windshields.

AVIONICS:
GPS
Nav/Com
DME
ADF
Intercom
Audio panel
Loran
Marker beacons

SYSTEMS & EQUIPMENT MALFUNCTIONS

OIL PRESSURE & TEMPREATURE:

Loss of oil Pressure: Reduce power and check oil temperature.

- If the temperature is raising, engine failure is **imminent.**
- Select an emergency landing area.
- If temperature stays normal, it may be an oil pressure gauge problem, land as soon as practical using minimal power.

Normal oil pressure, but High oil Temperature.

- Reduce power
- Increase airspeed for better cooling
- Enriching the mixture
- Open cowl flaps

CARB ICE

A loss of RPM (fixed pitch) or manifold pressure (constant speed) is a sign of carburetor ice.
Watch for it when the outside air temperature of $20^0 – 70^o$ F with high humidity.
Activate the carburetor heat or alternate air. Some alternate air is automatic.
When the carburetor heat is activated it will cause a loss in RPM (fixed pitch), as the ice melts the engine will run rough and have a further loss of RPM.
As the ice clears there will be an increase in RPM.
When it stabilizes the ice is gone.

FUEL STARVATION

Establish best glide speed, switch to the fullest main tank.
Enriching the mixture, turn on auxiliary fuel pump (if it has one).
Try the primer to pump fuel into the cylinders.
If all the fuel is gone, close the throttle.
Turn off the fuel valve and magnetos.
Squawk 7700, put out a MAY DAY ON 121.5

OVERHEATING OR ROUGHNESS

Reduce power
Increase airspeed (reduce climb or lower the nose)
Enrich the mixture
Open cowl flaps
This could be caused by pre-ignition (caused by hot carbon build up on a piston igniting the fuel before the spark plug fires it) or detonation (the fuel exploding because of too low of octane).

ALTERNATOR FAILURE

If the ammeter shows a discharge, reset the master switch and alternate breaker.
If this doesn't work shut off all non essential electrical equipment and **land ASAP.**
No electrical is needed to keep the engine running.

FLIGHT INSTRUMENTS

If the pitot tube freezes, the airspeed indicator acts lake an altimeter. Turn on the Pitot heat.
If the static port freezes the altimeter indicates the altitude at which the system was blocked, the vertical speed indicates level flight.
The airspeed indicator will read accurate at the altitude frozen.

High at lower altitudes
Low at higher altitudes

If this happens, open the alternate static source, if there isn't one; break the glass on the vertical speed indicator.
The turn coordinator is electrically driven, check the fuses or breaker.

It may have a flag to notify you it has failed.

The attitude indicator and directional indicator is vacuum driven, check this vacuum gauge.

GEAR

Fixed gear will be down and locked. But if you know there is a problem with one side, land on the good main and carry the bad as long as possible.

TRIM

The controls can be overpowered, but the answer they are looking for is: you can reduce power (or increase) and find a power setting to maintain altitude, climb or descend.

FLAPS

The flaps are electric, hydraulic or mechanical.
Know the different setting and degrees of each.
If you land with no flaps your approach speed and stall speed will be higher.
If full flaps are deployed a go around might be impossible.
If only one flap comes down, the plane will try to roll and yaw, over power with ailerons and rudder, and retract the flap.

DOOR AND WINDOW OPENING
No big deal most will close just as easily as on the ground.
Cherokee doors that do not have a handle at the top are a different story.
Open the side window, slip the airplane to the left and try to latch door.
If this doesn't work, land the plane and close door when stopped.

STRUCTURAL ICING
Use alternate air or carburetion heat if needed.
Run pitot heat.
You are now flying an airplane that you don't know anything about.
It is heavier, and it has untested aerodynamics.
Keep you airspeed up, don't use flaps and aim for the longest runway available.

SMOKE OR FIRE INSIDE CABIN
Shut down all electrical.
Extinguish the fire.
Bring essential electrical pieces back on line one at a time.
Land as soon as practical.

SMOKE OR FIRE IN THE ENGINE COMPARTMENT
Shut off fuel
Mixture to idle cut off, heat and vents off.
Lower the nose to try to blow out the fire.
Slip the airplane to keep the fire from coming in the cabin or reaching fuel cell.
Shut off everything and land ASAP.

HYPOXIA
Hypoxia is caused by insufficient oxygen to the lungs, from high altitude flying.
You can get drowsy or lightheaded.
Fingernails can turn blue or tingle.
Reaction time will decrease.
Judgment will be impaired, but you will think everything is just great.
Use supplemental oxygen or fly at a lower altitude.

CARBON-MONOXIDE POISONING
Carbon-monoxide poisoning is caused by engine exhaust coming into the cabin.
Some of the symptoms are:

- Headache
- Dizziness and drowsiness
- Loss of muscle power
- Blurred vision

Turn off heat and defrost and open vents and windows.
Land as soon as practical and seek medical attention.

MOTION SICKNESS

Motion sickness is caused by the brain receiving conflicting messages about the state of the body, or over stimulation of the inner ear.

Symptoms:

- Sweating
- Dizziness
- Nausea and vomiting

If this sets in:

- Open airvents
- Focus on an object far off in the distance.
- Avoid unnecessary head movements
- Land as soon as practical

STRESS

Stress is the body's reaction to physical or psychological demands on it.

- Heart rate, blood pressure, breathing rate increase.
- Chronic or long term stress is an intolerable burden that exceeds the ability to cope.
- If you have chronic stress or fatigue, see a doctor.
- Acute or short turn stress involves an immediate threat.
- Most times a person can deal with acute stress
- Fatigue is caused by lack of sleep or to much physical activity.
- It can also be from psychological stress.
- Acute fatigue can be prevented or cured by diet and sleep.
- If you have Chronic Fatigue from Insomnia or other medical problems, see a doctor.

DEHYDRATION

Dehydration is a critical loss of water from the body.
The first noticeable effect is fatigue.
Physical and mental ability decline.
Dizziness and nausea can set in.
Drink water on long flights.

SCUBA DIVING

Scuba diving allows nitrogen to dissolve in body tissue and fluid.
The body needs time to purge the nitrogen.
Flying shortly after scuba diving can give you the Bends.
If this happens descend and land as soon as practical.
The minimum time between non-decompression diving and flying is 12 Hours.
The minimum time between decompression diving and flying is 24 hours.

ALCOHOL

Even a small amount of alcohol can impair judgment, coordination, memory and attention span.
Altitude multiplies the effect of the brain.
8 hours between a bottle and a throttle.

DRUGS

Prescribed and over the counter medications may cause a loss in judgment, memory, coordinating alertness.
The Code of Federal Regulations prohibits pilots from acting as a crew member while using any medication that affects him in way contrary to safety.
Don't fly while taking any medication unless FAA approved.
If you are prescribed medication, and you want to know if it is safe to take while flying, contact you designated medical examiner.

SPIN AWARENESS

The wings must stall before the airplane will spin.
The raised wing produces a small amount of lift and the plane spins in the direction of the lower wing.
This can happen on a turn from base to final when the controls are not coordinated.
Reduce power, release back pressure, neutralize the ailerons, and apply opposite rudder.