

PRE-SOLO WRITTEN EXAM

STUDY GUIDE

SECTION I: AIRCRAFT SYSTEMS AND LIMITATIONS

1. Engine manufacturer - Lycoming
2. Engine type O360-A4A
3. Fuel type and color and why 100LL Blue, determine right fuel, differentiate from water
4. Fuel quantity 50 gal total, 25 a side, 18 to the tabs, 36 total with both tanks at tabs
5. Oil type and quantity minimums and maximums 20W50 2qt min 8qt max
6. All V-Speeds, their definition, and numerical values
(PA-28-180D Checklist, website resources page)
7. Label photos of the exterior components, antennas, etc
(From your preflight video, oral exam guide)
8. Weights and capacities
(PA-28-180D Student Pilot POH, page 2)

Know the following information about general aircraft systems

1. four stages of the internal combustion engine
Intake compression combustion exhaust
 2. carburetor heat, when to use it and how it functions
Use it when carb ice is suspected, hot air from around exhaust pipe ducted to carb
 3. Carburetor ice, when the risks are increased
Can happen as high as 95F if humidity is high enough / visible moisture
 4. Mixture control function, what does it do? Why do we need it? Etc.
Mixture controls amount of fuel to carb, reduced fuel at higher altitude to maintain ratio of fuel to air
 5. Pitot static instrument system
Airspeed indicator, altimeter, vertical speed indicator
 2. Gyroscopic instrument system
Attitude indicator, heading indicator, turn coordinator
- Know how the flight instruments actually function

Know the control surfaces of the aircraft and the various components of the aircraft

SECTION II: BASIC AERODYNAMICS

Airfoil – know the anatomy of the airfoil such as chord line, angle of attack, leading and trailing edges etc.

Understand ground effect and what it causes where its encountered etc

Stalls – demonstrate understanding of what causes them such as exceeding critical angle of attack speed doesn't matter

Three axis of flight – longitudinal, lateral, vertical

Wake turbulence avoidance

Density altitude – what is it? Where is it most likely encountered? What are its effects?

SECTION III: THE FLIGHT ENVIRONMENT

Obstacle clearance requirements for a congested area, uncongested area

Cloud clearance and visibility requirements for class B, C, D, E, G airspace

Identify class of airspace as printed on a sectional chart

PAPI and VASI indications

Communication requirements for Class B, C and D airspace

Memorize the required instruments or equipment for day VFR acronym

T	Tachometer
O	Oil Pressure Gauge
M	Manifold pressure gauge if turbo/super
A	Airspeed indicator
T	Temp gauge if liquid cooled
O	Oil temp gauge if air cooled
S	Seatbelts for each occupant
A	Altimeter
F	Fuel gauges for each tank
L	Landing gear position indicator if retractable gear
A	Anticollision light
M	Magnetic Compass
E	ELT

Memorize the required instruments and equipment for night flight VFR

F	Fuses (spare set)
L	Landing light if for hire
A	Anti Collision lights
P	Position lights
S	Source of power

Memorize the required maintenance and inspections

- A Annual inspection every 12 calendar months
- V VOR check every 30 days if IFR
- 1 100 hour every 100 hours if hired / instructing
- A Altimeter static system check every 24 calendar months
- T Transponder test and inspection every 24 cal mo
- E ELT test and inspection every 12 cal mo

Memorize the standard transponder codes

- | | |
|---------------------|-------------------------------|
| 1200 – VFR aircraft | 7600 – Communications failure |
| 7700 – Emergency | 7500 – Hijacked aircraft |

Memorize the required documents aboard the aircraft

- A Airworthiness Certificate
- R Registration certificate
- O Operating limitations
- W Weight and balance data

Privileges and limitations of a student pilot

(FAR 61.89 stay within 25nm of home airport, don't land other places unless endorsed or emergency, can night solo but only if signed off for it, no passenger or property carriage etc)