Student Flight Homework

Private Pilot Section

Consult your flight instructor for assignment due dates

If you have any suggestions, comments, or questions concerning this section, please contact your flight instructor for assistance.

Lesson 1
Homework Assignment

1. What are the required items the student must have daily?

2. Where can you find what tasks will be covered in each lesson?

3. If you find a discrepancy in the aircraft logs, who should you notify?
    a. Nobody, this might mean I can not fly
    b. Tower
    c. Instructor

4. When should I show up before each flight?
    a. 1 hour before flight
    b. 2 hours before flight
    c. 30 minutes before flight

5. What does the term “Note” mean in the operations manual?

6. When taxiing in the vicinity of the fuel truck, flight crews will make sure to maintain at least _____ feet from the fuel truck at all times.

7. All flight crews will write down ALL taxi instructions, no matter how simple.
    a. True
    b. False
    c. Maybe

8. What are the weather minimums for dual VFR traffic pattern?
    Visibility_____ sm
    Ceiling _____ft

9. What are the required pre-flight actions per FAA (91.103)?
Preflight

10. Can we use avationweather.gov in place of a weather briefing?
    a. True
    b. False

11. What is the procedure for a positive exchange of flight controls?

12. 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.

13. What is the purpose of the rudder on an airplane?
    a. To control yaw.
    b. To control over banking tendencies.
    c. To control roll.

14. What type of flaps are fitted to your aircraft, and how are they operated?

15. An abnormally high engine oil temperature indication may be caused by
    a. The oil level being too low.
    b. Operating with too high viscosity oil.
    c. Operating with an excessively rich mixture.

16. Excessively high engine temperatures will
    a. Cause damage to heat conducting hoses and warping of the cylinder cooling fins.
    b. Cause loss of power, excessive oil consumption, and possible permanent internal engine damage.
    c. Not appreciably affect an aircraft engine.

17. If the engine oil temperature and cylinder head temperature gauges have exceeded their normal operating range, the pilot may have been operating with
    a. The mixture set too rich.
    b. Higher than normal oil pressure.
    c. Too much power and with the mixture set too lean.

18. What type of engine is fitted to your aircraft, and what power is it rated?

19. What is the maximum and minimum oil level in your aircraft?

20. What type of fuel can be substituted for an aircraft if the recommended octane is not available?

a. The next higher-octane aviation gas.
b. The next lower octane aviation gas.
c. Unleaded automotive gas of the same octane rating.

21. Where are the fuel tanks located in your aircraft, and what is the usable and unusable capacity?

22. What color is AVGAS (100LL) fuel, and what does the LL mean?

23. How many drains are on the aircraft, and what are you looking for?

24. What is the diameter of the propeller on your aircraft, and who manufactured it? (AFM)

25. What is ATIS, and how do you collect it? (AIM)

26. How can you determine that the pre-flight inspection of the aircraft is complete?

27. You have a copy of the AFM on your ForeFlight; can you use the weights found in it?

Lesson 2
Homework Assignment

References: Jeppesen Chapter 2 & Aircraft Flight Manual (AFM), FAR/AIM

1. List the ATC light gun signals for aircraft taxiing and for aircraft in flight.

Light Signal	On Ground	In Air
Steady Green		
Flashing Green		
Steady Red		
Flashing Red		
Flashing White		
Alternating Red/Green		

2. List the following aircraft V- Speeds

Va = _____ Vfe = _____ Vno = _____
Vx = _____ Vne = _____ Vy = _____

3. What are the definitions of the V- Speeds?

Va = _____
Vx =_____
Vy =_____

4. The color scheme for signs identifying what Taxiway you are on is

A. Black inscription on yellow background.
B. Yellow inscription on black background.
C . White inscription on black background.

5. Runway pavement markings are

A . Blue in color.
B. Yellow in color.
C. White in color

6. A controller who says “go ahead” means

A. Proceed as requested.

B. Continue straight ahead.
C. State your request.

7. Define the following Aviation Phraseology

Acknowledge –

Advise intentions –

Affirmative –

Confirm –

Correction –

Go ahead –

Hold –

Hold short of –

Negative –

Proceed –

Read back –

Say again –

Standby –

Unable –

Verify –

8. Do you need permission from ATC to enter the Non-movement area?

a. Yes.
b. No.

9. On an airport without an operating control tower, do you need permission from FAA to get onto the runway or taxiway?

a. Yes.
b. No.

10. How do you know the 100-hour inspection has been completed?

11. When do the FARs require an inspection on the transponder? The ELT?

12. What is the procedure recommended to ensure that the emergency locator transmitter (ELT) has not been activated?

A. Turn off the aircraft ELT after landing.
B. Ask the airport tower if they are receiving an ELT signal.
C. Monitor 121.5 before engine shutdown.

Lesson 3
Homework Assignment

1. Explain the pre-maneuver checklist.

2. Define the following terms
Moment –

Arm –

Empty Weight –

Best Rate Climb –

Best Angle of Climb -

Airmanship –

Coordination –

3. Explain the proper procedure to exchange the flight controls

5. Describe the function of the ammeter.

6. What would you do if a circuit breaker ‘popped’, and what is the importance of the numbers on them?

7. What is the difference between the landing and the taxi light?

8. What causes the stall horn to operate in your aircraft? (AFM)

9. If the low voltage Caution illuminates, what should you do?

10. What hydraulic fluid is used in your aircraft, and what is its color? (AFM)

11. The uncontrolled firing of the fuel/air charge in advance of normal spark ignition is known as
A. Combustion
B. Pre-ignition
C. Detonation

12. How do you taxi an aircraft?

13. What control inputs would be used with a light quartering tail-wind?

14. Complete the blanks on the back of the take-off data card (below) – use the following weights and fuel quantity;

Basic Empty Weight – 1170.0 Arm – 31.16 Moment – 36453.6
Pilot and student (passenger) – 340lbs.
Baggage – 5 lbs.
Fuel – Full Standard Tanks

Can we go?

Lesson 4
Homework Assignment

1. How does the heater work in your aircraft? (AFM)

2. Which instrument will become inoperative if the pitot tube becomes clogged?
    A. Altimeter.
    B. Vertical Speed.
    C. Airspeed.

3. What does the red line on the airspeed indicator represent?
    A. Maneuvering speed.
    B. Turbulent or rough-air speed.
    C. Never exceed speed.

4. How can you adjust the brightness of the G1000?

5. How would you tune in frequencies of .25 intervals?

6. 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.

7. The term angle of attack is defined as the angle between the chord line of an airfoil and the
    A. Direction of the relative wind
    B. Pitch angle of an airfoil
    C. Rotor plane of rotation

8. During an approach to a stall, an increased load factor will cause the airplane to
    A. Stall at a higher airspeed
    B. Have a tendency to spin
    C. Be more difficult to control

9. What happens to the nose of the aircraft when you add flaps? Why?

10. How and when can an airplane be stalled?

11. How would you recover after a stall occurred?

12. What is the critical angle of attack?

13. What is the maximum magneto drop? What is the maximum difference between the two magnetos? What is the procedure if the drop exceeds the maximum?

14. What is the first step in the procedure to demonstrate a power-off stall in the landing configuration?

15. You notice a drop on the ammeter after the engine start, what does this indicate?

16. During engine run-up you turn the key to L, and there is a drop of 50 RPM, what does this mean?

17. What is the difference between the OFF and standby positions on the transponder?

18. Does your passenger need their seat belt on when the aircraft is still on the ground?

19. What items should be included in the departure briefing?

20. Fill in the missing words in the sample radio call for taxi instructions –

“Clearance _____ this is N531DS, at the RVA Flyers _____, requesting _____ to the north at 2500”

After Departing RIC Airport:

“Potomic _____ N556JM, 800 _____ 1500, departing Richmond, zero-five zero assigned.”

Arriving at RIC from the North:

“Potomic _____ N531DS, 10 miles, north-east of RIC, with _____ delta, requesting _____.

Lesson 5
Homework Assignment

1. 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.

2. When does P-factor cause the airplane to yaw to the left?
    A. When at low angles of attack.
    B. When at high angles of attack.
    C. When at high airspeeds.

3. What happens aerodynamically during a stall?

4. What action should be taken if landing behind a large aircraft that just took off?

5. What action should be taken if landing behind a large aircraft that just landed?

6. Describe what you'd do if engine failure occurred after takeoff, if you were at 200'AGL? What would you do different if engine failure occurred at 2000'AGL (POH, FSM)?

7. What is meant by overbanking tendency?

8. How would you know if you were picking up carburetor icing?

9. What would happen if you turned off the master switch during flight?

10. How would you know if the alternator is inoperative? How would you reset it? (POH)

11. In your own words, explain flight at critically slow airspeed.

12. What is density altitude? What three forces increase it?

13. What are the sections of the POH for your aircraft (in order)?

14. Describe the procedure for demonstrating a power-on stall. When is this stall most likely to occur?

15. What is meant by ground effect?

16. What is the safe taxi speed anywhere?

Lesson 6
Homework Assignment

1. When you check the fuel sample, what are you looking for?

2. Describe in detail the engine in your aircraft.

3. What is the usable fuel for your aircraft?

4. Who manufactures the propeller on your aircraft?

5. What type of flaps are on your aircraft?

6. Where is the battery located and what voltage is it?

7. Name the four forces.

8. What is adverse yaw?

9. What are the benefits of flaps?

10. What happens in ground effect?

11. Name four ways to determine wind direction.

12. How and why would you clear the area before you turn?

13. Describe collision avoidance procedures.

14. How far out must a radio call be made to a control tower?

15. How would you slow down from 90 knots to 60 knots without losing altitude?

16. Explain maneuvering at critically slow airspeed.

17. What is P-Factor? Torque? Slip-stream effect? How do you correct them?

18. What is the purpose of "See and Avoid?"

Lesson 7
Homework Assignment

1. How would you determine that the aircraft you are about to fly is airworthy?

2. If, when checking the magnetos during run-up, one is running rough, what would you do?

3. When, and which occupants must use seatbelts? Shoulder harnesses? (FAR 91.107)

4. If two airplanes are converging head on, what corrective action should be taken?

5. The numbers 9 and 27 on a runway indicate that the runway is oriented approximately
   A. 009º and 027º true
   B. 090º and 270º true
   C. 090º and 270º magnetic

6. An airport's rotating beacon operated during daylight hours indicates?
   A. there are obstructions on the airport
   B. that weather at the airport located in Class D airspace is below basic VFR weather minimums
   C. the Air Traffic Control tower is not in operation

7. A blue-segmented circle on a sectional chart depicts which class airspace?
   A. Class B
   B. Class C
   C. Class D

8. Airspace at an airport with a part-time control tower is classified as Class D airspace only
   A. when the weather minimums are below basic VFR
   B. when the associated control tower is in operation
   C. when the associated Flight Service Station is in operation

9. Describe Class "C" airspace characteristics.

10. Where on the chart would you find a list of all the control tower frequencies used on that chart

11. What is the difference between a sectional chart, and a terminal area chart?

12. How long are charts current, and how can you tell if your chart is current?

13. At what altitude should you turn crosswind when remaining in the pattern? (AIM)

14. Name four ways to determine wind direction.

15. Why do we practice ground reference maneuvers? (ACS)

Lesson 8
Homework Assignment

1. The lateral dimensions of Class D airspace are based on
    A. the number of airports that lie within the Class D airspace
    B. 5 statue miles from the geographical center of the primary airport
    C. the instrument procedures for which the controlled airspace is established

2. Which initial action should be taken prior to entering Class C airspace?
    A. contact approach control on the appropriate frequency
    B. contact the tower and request permission to enter
    C. contact the FSS for traffic advisories

3. After landing at a tower-controlled airport, when should the pilot contact ground control?
    A. when advised by the tower to do so
    B. prior to turning off the runway
    C. after reaching a taxiway that leads directly to the parking area

4. Describe what you would do if engine failure occurred after takeoff, if you were at 200'AGL? What if you were at 2000'AGL? What if it was a partial power loss?

5. What are the weather minimums for VFR local flight? Maximum wind velocities?

6. What is the maximum crosswind component for the aircraft you fly? What would be your personal limits on a solo flight?

7. What is a forward slip? What is a side-slip (wing low)?

8. When on final approach for landing, how would you know you are high? How could you correct?

9. How could you correct if you are low and the aircraft is slow on final approach?

10. Provide two examples of the practical application of slow flight, rectangular course, S-turns, and turns around a point.

11. While taxing, you experience a quartering tailwind from the right; in which direction would you position the control surfaces?

12. Describe how you can avoid wake turbulence when departing behind a heavy aircraft.

13. You are cleared to land behind a Boeing 737 at RIC. To properly avoid the heavy aircraft's wake turbulence you should

A. fly below the B737's glide path and land prior to it's touchdown point.
B. request a different runway for landing because wake turbulence should linger for 5 minutes.
C. fly above the B737's glide path, note the touchdown point and land past that point.

14. A heavy aircraft develops the most wake turbulence when it is

A. heavy, clean and slow.
B. at maximum thrust just prior to takeoff.
C. when in cruise flight at high airspeeds.

15. The wind condition that requires maximum caution when avoiding wake turbulence on landing is a

A. light, quartering headwind
B. light, quartering tailwind.
C. strong headwind.

16. When taking off or landing at an airport where heavy aircraft are operating, one should be particularly alert to the hazards of wingtip vortices because this turbulence tends to

A. rise from a crossing runway into the takeoff or landing path
B. rise into the traffic pattern area surrounding the airport
C. sink into the flight path of aircraft operating below the aircraft generating the turbulence

17. Wingtip vortices are created only when an aircraft is
    A. operating at high airspeeds.
    B. heavily loaded.
    C. developing lift.

Lesson 9
Homework Assignment

1. List five different resources that would assist you in determining weather when considering the conditions for the day of your flight.

2. What is the minimum flight visibility and ceiling height to operate in Class D airspace?

3. Define special VFR. What are the special VFR weather minimums in Class D airspace?

4. You received the following landing clearance from ATC, what would you repeat back? “N531DS, you are following traffic on a 2-mile final, you are number two for the runway, cleared to land runway 2.”

5. What would it mean if RIC the tower tells you to, “fly directly to the base, cleared to land.”?

6. What would you do if RIC, tower tells you to “extend your downwind, I’ll call your base.”?

7. While remaining in the pattern for touch and go landings, what altitude do you start your crosswind leg at? How far should you be from the runway on downwind?

8. The final authority as to the operation of an aircraft is the
    A. Federal Aviation Authority
    B. pilot in command
    C. aircraft manufacturer

9. To act as pilot and command of an aircraft carrying passengers, the pilot must have made at least three takeoffs and three landings in an aircraft of the same category, class and if a type rating is required, of the same type, within the preceding
    A. 90 days

B. 12 calendar months
C. 24 calendar months

10. Where should a pilot look for the following traffic? “Traffic 3 O’clock, 2 miles, southbound.” When you are flying north bound.

A. East
B. South
C. West

11. Safety belts are required to be properly secured about which persons in an aircraft and when?

A. Pilots only, during takeoffs and landings.
B. Passengers, during taxi, takeoffs, and landings only.
C. Each person on board the aircraft during the entire flight.

12. With respect to passengers, what obligation, if any, does a pilot in command have concerning the use of safety belts?

A. The pilot in command must instruct the passengers to keep their safety belts fastened for the entire flight.
B. The pilot in command must brief the passengers on the use of safety belts and notify them to fasten their safety belts during taxi, takeoff and landing.
C. The pilot in command has no obligation in regard to passengers’ use of safety belts.

13. Except when necessary for takeoff or landing, what is the minimum safe altitude for a pilot to operate an aircraft anywhere?

A. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
B. An altitude of 500 feet above the surface and no closer to 500 feet to any person, vessel, vehicle or structure.
C. An altitude of 500 feet above the highest obstacle within a horizontal radius of 1000 feet.

14. Except when necessary for takeoff or landing, what is the minimum safe altitude required for a pilot to operate an aircraft over congested areas?

A. An altitude of 1,000 feet above any person, vessel, vehicle or structure.
B. An altitude of 500 feet above the highest obstacle within a horizontal radius of 1,000 feet of the aircraft.
C. An altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

15. If an altimeter setting is not available before flight, to which altitude should the pilot adjust the altimeter?

A. The elevation of the nearest airport corrected to mean sea level.
B. The elevation of the departure area.
C. Pressure altitude corrected for nonstandard temperature.

16 If an in-flight emergency requires immediate action, the pilot in command may

A. deviate from the FAR's to the extent required to meet the emergency, but must submit a written report to the Administrator within 24 hours.
B. deviate from the FAR's to the extent required to meet that emergency.
C. not deviate from the FAR's unless prior to the deviation approval is granted by the Administrator.

Lesson 10
Homework Assignment

1. List the airspace/conditions that require a transponder. Do we need a transponder to operate into and out of RIC? If so, why?

2. On what frequency does the ELT transmit? When can we test it?

3. If the aircraft's radio fails, what is the recommended procedure when landing at a controlled airport?

   A. Observe the traffic flow, enter the pattern, and look for a light signal from the tower.
   B. Enter a crosswind leg and rock the wings.
   C. Flash the landing lights and cycle the landing gear while circling the airport.

4. What is ATIS? AWOS? ASOS?

5. What conditions are necessary for the formation of thunderstorms?

6. List the properties of a stable air mass. List the properties of an unstable air mass.

7. True or False: The AIM recommends maintaining a minimum distance of 20 NM from a severe thunderstorm with an anvil top.

8. Define three different types of fog. Where would you most likely encounter each type of fog?

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

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

10. The development of thermals depends upon

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

11. 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.

12. When may hazardous wind shear be expected?

A. When stable air crosses a mountain barrier when 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.

13. What clouds have the greatest turbulence?

A. Cirrus clouds.
B. Nimbostratus clouds.
C. Towering cumulus clouds.

Lesson 11
Homework Assignment

1. List the different types of NOTAMs and provide one example of each.

2. What are the three different types of weather reports that can be obtained through FSS? How can you contact FSS?

3. List the meteorological conditions that would be listed in a Convective Sigmet, Sigmet, and Airmet.

4. Name three different sources of obtaining current weather information while en route.

5. What is an FA? What information will it provide?

6. Describe the procedure when filing a PIREP. Who do you contact, and what information is provided in
what order?

7. Radar weather reports are of special interest to pilots because they indicate
    A. large areas of low ceilings and fog.
    B. location of precipitation along with types, intensity, and trend.
    C. location of broken to overcast clouds.

8. What values are used for Winds Aloft Forecasts?
    A. Magnetic direction and knots.
    B. Magnetic direction and miles per hour.
    C. True direction and knots.

9. What does the AIM recommend for a personal checklist before flying?

10. What is hypoxia? List the different types of hypoxia. What are the symptoms?

11. What is hyperventilation? What are the symptoms of hyperventilation?

Lesson 12
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage I check.

Lesson 13
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage I check.

Lesson 14
Homework Assignment

1. What action should be taken if a pilot suspects carbon monoxide poisoning? How can we determine safe or unsafe levels of carbon monoxide in our aircraft?

2. List the AIM recommendation for flight after scuba diving.

3. Large accumulation 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.

4. Susceptibility to carbon monoxide poisoning increases as
    A. altitude increases.
    B. altitude decreases.
    C. air pressure increases.

5. What does VOR stand for? VORTAC? DME?

6. During flight, explain the procedure for VOR orientation. How can you determine what radial you are FROM the station?

7. Without DME, how can you determine your distance from a station using a VOR?

8. List the VOR and NDB service volumes found in the AIM.

9. What is GPS? How many satellites are in the constellation? How many satellites are required for VFR navigation?

10. When navigating by a VOR, when will you have ‘reverse sensing?’

11. How does the magnetic compass work?

12. List the various magnetic compass errors and briefly discuss them.

13. How does the extension of flaps affect the aircraft's pitch attitude?

14. While extending flaps for landing, one flap extends, and the other does not. What immediate action should you take?

15. In the event of an electrical system failure, what amount of time can you reasonably expect electrical power from the battery?

16. While extending the flaps for landing, one flap extends, and the other does not. What immediate action should you take?

17. What procedure should you follow in the event a door unexpectedly opens immediately after takeoff?

Lesson 15
Homework Assignment

1. Explain the procedure for a soft-field takeoff and climb in the aircraft you fly.

2. Explain the procedure for a short-field takeoff and climb in the aircraft you fly.

3. Define ground effect. At what height above the ground can you experience ground effect?

4. Aerodynamically, why do we use 10 degrees of flaps for short and soft-field takeoffs?

5. Ground effect is most likely to result in which problem?

A. Settling to the surface abruptly during landing.
B. Becoming airborne before reaching recommended takeoff speed.
C. Inability to get airborne even though airspeed is sufficient for normal takeoff needs.

6. What must a pilot be aware of as a result of ground effect?

A. Wing tip 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.

7. What is a stall? What causes an aircraft to stall? How would you recover from a stall?

8. What is a spin? What causes a spin? How would you recover from an inadvertent spin?

9. Name four aspects of an aircraft with a forward center of gravity. List four aspects of an aircraft with a rearward center of gravity (stability, stall speed/characteristics, cruise speed, etc.). On the pre-flight, how do we assure that the aircraft you fly does not have an aft or forward CG?

10. Loading an airplane to the most aft CG will cause the airplane to be
    A. less stable at all speeds.
    B. Less stable at slow speeds, but more stable at high speeds.
    C. less stable at high speeds, but more stable at low speeds.

11. Define the term density altitude. What factors affect air density?

12. Describe what effect a high-density altitude day would have on an aircraft's takeoff and landing roll.

13. List and briefly describe the five different types of airspeed. Describe how you would convert indicated airspeed to true airspeed.

14. List and briefly describe the five different types of altitude.

15. 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.

16. Under what condition will true altitude be lower than indicated altitude?
    A. In colder than standard air temperature.
    B. In warmer than standard air temperature.
    C. When density altitude is higher than indicated altitude.

Lesson 16
Homework Assignment

1. What causes the winds aloft to flow parallel to the isobars? Why do surface winds generally flow across isobars at an angle?

2. What are the three stages of a thunderstorm and their characteristics?

3. Name several types of icing. Name several types of fog.

4. A nonfrontal, narrow band of active thunderstorms that often develop ahead of a cold front is known as
   A. pre-frontal system.
   B. squall line.
   C. dry line.

5. Which weather phenomenon is always associated with a thunderstorm?
   A. Lightning.
   B. Heavy rain.
   C. Hail.

6. What is meant by the term ‘dew point?’
   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.

7. Clouds, fog, or dew will always form when
   A. water vapor condenses.
   B. water vapor is present.
   C. relative humidity reaches 100 percent.

8. The amount of water vapor which air can hold depends on the
   A. dew point.
   B. air temperature.
   C. stability of the air.

9. What are the processes by which moisture is added to unsaturated air?

A. Evaporation and sublimation.
B. Heating and condensation.
C. Supersaturation and evaporation.

10. Clouds are divided into four families according to there
A. outward shape.
B. height range.
C. composition.

11. The conditions necessary for the formation of cumulonimbus clouds are a lifting action and
A. unstable air containing an excess of condensation nuclei.
B. unstable, moist air.
C. either stable or unstable air.

12. List the Pitot Static instruments. What would happen to each instrument if the pitot tube were clogged? What would happen to each of the instruments if the static source blocked at 2000' and you were climbing?

13. Name three different ways of navigating and provide a brief explanation of each.

14. List the diversion and lost procedures from the Flight Standards Manual for the aircraft you fly.

15. If you were lost, what frequencies and facilities could you use to navigate or communicate yourself to an airport?

16. Describe VFR Flight Following: what it is, who does it, what its limitations are, how to get it.

Lesson 17
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage II check.

Lesson 18
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage II check.

Lesson 19
Homework Assignment

1. What four types of briefs are available from a weather briefer (FSS).

2. What is EFAS? What is HIWAS? What weather or hazardous information may be given on each? What frequencies can you receive EFAS and HIWAS?

3. True or False A METAR is the best weather forecast to use for a long cross-country flight that you plan on flying in a couple of hours.

4. How often are METAR's issued? What are the different types of METAR's? What is a METAR best suited to tell you?
Example: METAR KJFK 1250Z 33018KTG23 290V360 1/2SM R31/2700FT +SN BLSNFG VV008 00/M03 A2291 RMK RAE42 SNB42 SLP0193 T0000103

5. Using the METAR above, detail each block. Would you remain in the pattern for just a couple of touch and go's at KJFK if this report were current?

6. What information is entailed in a PIREP? What information would you have prepared to give your own PIREP to FSS if you were requested to report the current conditions in your area?

7. Decode the following PIREP. KCMH UA/OV KAPE 210050/TM 2122/FL045/TP CRJ60/SK SCT 065/WX FV08SM HZ FU/TA 20/TB LGT

8. What size of an area does a TAF contain? How often are TAF's issued and what is their validity?

9. What is an FA? How often are FA's issued? List the four sections of an FA.

10. What report would you use to determine the winds at 5500’ along your route of flight?

11. Describe in detail what is contained in a Convective SIGMET.

12. Describe in detail what is contained in a SIGMET.

13. Describe in detail what is contained in an AIRMET. What are the different types of AIRMETS?

14. What are the three different types of NOTAM’s? Describe and provide one example of each.

15. What is the FAA’s definition of a ceiling?

16. Define the following terms. IFR, MVFR, VFR

Lesson 20
Homework Assignment

1. How would you determine that the aircraft you are about to fly is airworthy?

2. While taxing, you experience a quartering tailwind from the right; in which direction would you position the control surfaces?

3. You are cleared to land behind a Boeing 727 at RIC. To properly avoid the heavy aircraft's wake turbulence, you should

A. fly below the B727's glide path and land prior to its touchdown point.
B. request a different runway for landing because wake turbulence should linger for 5 minutes.
C. fly above the B727's glide path, note the touchdown point, and land past that point.

4. What is the minimum flight visibility and ceiling height to operate in Class D airspace?

5. The final authority as to the operation of an aircraft is the

A. Federal Aviation Authority
B. Pilot in Command
C. Aircraft Manufacturer

6. Except when necessary for takeoff or landing, what is the minimum safe altitude for a pilot to operate an aircraft anywhere?

A. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
B. An altitude of 500 feet above the surface and no closer to 500 feet to any person, vessel, vehicle, or structure.
C. An altitude of 500 feet above the highest obstacle within a horizontal radius of 1000 feet.

7. List the ATC light gun signals for aircraft taxiing and for aircraft in flight.

8. When may hazardous wind shear be expected?

A. When stable air crosses a mountain barrier when 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.

9. In the Northern Hemisphere, a magnetic compass will normally indicate a turn toward the north if

A. a right turn is entered from an east heading.

B. a left turn is entered from a west heading.

C. an aircraft is accelerated while on an east or west heading.

10. Deviation in a magnetic compass is caused by the

A. presence of flaws in the permanent magnets of the compass.

B. difference in the location between true north and magnetic north.

C. magnetic fields within the aircraft distorting the lines of magnetic force.

11. The pitot system provides impact pressure for which instrument?

A. Altimeter.

B. Vertical-speed indicator

C. Airspeed indicator.

12. Why must you re-calculate your ground speed after a diversion?

13. Explain the procedures for entering an uncontrolled field.

14. Explain the procedures for exiting an uncontrolled field.

15. Explain how you would enter a pattern at an uncontrolled field if you are 10 miles southeast of the airport, and the airport is landing left traffic for runway 35.

16. After your touch and go at the above airport, on upwind, you intend on departing the field to the east. How would you safely exit the pattern to the east?

Lesson 21
Homework Assignment

1. List all of the required equipment for a VFR flight at night.

2. What are the VFR fuel requirements for a night flight?

3. If a private pilot wanted to carry a passenger at night, what is the recent flight experience he/she must have?

4. List the following color of each airport marking at night: runway edge lights, runway centerline lights, runway end identifier lights, taxiway lights, and taxiway centerline lights.

5. If you were on a night flight and saw a rotating beacon emitting two quick white and green lights, what type of airport would that be? What if the beacon was yellow and white? What if the beacon was green, yellow, and white?

6. If you were approaching an airport intending to land at night, how would you activate the pilot-controlled lighting if the airport was equipped?

7. If engine failure occurs at night, what should a pilot do?

8. True or False When landing at night and with the surrounding terrain featureless, a pilot may feel that the aircraft is higher and will therefore fly a lower approach.

9. List three other illusions in flight that could be experienced at night.

10. How can a pilot determine when to begin the round-out flare at night?

11. The AIM recommends that pilots adapt their eyes for night flights; how long in advance? What type of lighting is recommended for use inside the aircraft while conducting a night flight?

12. How does the AIM recommend scanning for traffic at night?

13. During a night flight, you observe a steady red light and a flashing red light 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 crossing to the right.
C. The other aircraft is approaching head-on.

14. How can you determine if an aircraft is on a collision course with your aircraft?

A. The other aircraft will always appear to get larger and closer at a rapid rate.
B. The nose of each aircraft is pointed at the same point.
C. There will be no apparent relative motion between your aircraft and the other aircraft.

15. List the lost procedures from the Flight Standards Manual. Would you have any other considerations at night with respect to lost procedures?

16. How is night defined for the purpose of carrying passengers?

Lesson 22
Homework Assignment

1. Explain pilotage and dead reckoning.

2. Why do we complete Navigation logs? What do the regulations say regarding a flight, not in the vicinity of the airport?

3. What are some considerations for your route of flight? Can we fly through restricted areas or warning areas? What airspace considerations should you contemplate?

4. What are some considerations when selecting checkpoints?

5. How can you determine the time, fuel, and distance to climb up to altitude for the aircraft you fly?

6. Figure the following fuel, time, and distance that it would take you to climb with the following: Airport elevation- 55', climb to 3500', 20 Celsius, with a 9-knot headwind.

7. What would be some considerations for the altitude selected on the route of flight?

8. How can you determine the cruise airspeed for your aircraft at the cruising altitude you selected for you flight?

9. How can you convert indicated to calibrated airspeed, and calibrated airspeed to true airspeed?

10. How far apart should your checkpoints be? Why?

11. Explain how you would conduct a diversion in flight. Describe the maneuver and explain why you do a different ground speed check.

12. When planning a cross-country, are there any additional items that should be considered on the pre-flight?

13. Why is a weather brief important prior to any flight?

14. What are other sources of weather that you would want to gather prior to a cross-country flight?

15. When conducting a cross-country flight, what NOTAMS are detrimental for your route of flight?

Lesson 23
Homework Assignment

1. What are some considerations for your route of flight? Can we fly through restricted areas or warning areas? What airspace considerations should you contemplate?

2. What are some considerations when selecting checkpoints at night?

3. How far apart should your checkpoints be? Why?

4. What is a ‘Maximum Elevation Figure,’ and why is it useful on a night cross-country?

5. What equipment must the pilot consider taking along on a night flight?

6. What information in the AFD would you want to gather prior to departing for a flight to a distant airport at night?

7. What is good operating practice in the use of aircraft lighting while on the ground?

8. List the various types of interior lighting in the aircraft you fly. Explain how to adjust or operate each.

9. Describe the procedure when landing at night without a landing light.

10. During the en route segment of a night flight, how can a pilot determine they are flying from VFR conditions to potentially marginal VFR or IFR conditions?

11. How can you determine when it would be appropriate to descend on a cross-country?

12. If you encounter a cloud or IFR conditions, what can you do?

13. If you were approaching an airport intending to land at night, how would you activate the pilot-controlled lighting if the airport was equipped?

14. How can a pilot determine when to begin the round-out flare at night?

Lesson 24
Homework Assignment

1. Summarize lift, as explained by Newton and Bernoulli.

2. Explain the three different types of drag.

3. Explain the four left-hand turning tendencies? When are each of the forces most predominant?

4. What is load factor? How does load factor increase the stall speed?

5. List and define the four common types of flaps.

6. What causes adverse yaw? How has Cessna designed the aircraft to help prevent adverse yaw?

7. What types of flaps and ailerons do the aircraft you fly have?

8. Will the indicated airspeed at which the aircraft stalls change as altitude increases?

9. What force makes an aircraft turn?
    A. The horizontal component of lift.
    B. The vertical component of lift.
    C. Centrifugal force.

10. The left-turning tendency of the airplane caused by P-factor is the result of

A. clockwise rotation of the engine and the propeller turning the airplane counterclockwise.

B. propeller blade descending on the right, producing more thrust than the ascending blade on the left.

C. gyroscopic forces applied to the rotating propeller blades acting 90 degrees in advance of the point the force was applied.

11. The amount of excess load that can be imposed on the wing of an airplane depends on the

A. position of the CG

B. speed of the airplane

C. abruptness at which the load is applied.

12. During an approach to a stall, an increased load factor will cause the airplane to

A. stall at a higher airspeed.

B. have a tendency to spin.

C. be more difficult to control.

13. When does P-factor cause the airplane to yaw to the left?

A. When at low angles of attack.

B. When at high angles of attack.

C. When at high airspeeds.

14. 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.

15. Which basic flight maneuver increases the load factor on an airplane as compared to straight-and-level flight?

A. Climbs

B. Turns

C. Stalls

Lesson 25
Homework Assignment

Describe the Following Systems:
Primary Flight controls and trim

Power Plant

Landing Gear System

Fuel System

Lesson 26
Homework Assignment

1. How are ailerons connected?

2. What is adverse yaw a result of?

3. What is the purpose of a trim system?

4. What is a magneto?

5. What are the four strokes, and what happens in each stroke?

6. What is a propeller?

7. How many spark plugs are in each cylinder?

8. How can engine temperatures be decreased?

9. What is detonation?

10. What can detonation lead to?

11. Are detonation and pre-ignition similar?

12. How does shock absorption happen?

13. What are the advantages of a tricycle landing gear?

14. What does a fuel strainer do?

15. What should be done if water is found in the sump?

16. What are some important functions of the oil system?

Lesson 27
Homework Assignment

1. How many volts is the electrical system of the aircraft you fly?

2. What advantages does an alternator have over a generator?

3. What functions do circuit breakers and fuses do?

4. What is on the avionics bus?

5. What does the pitot tube measure?

6. What needs to be checked before every flight on the pitot tube?

7. What is the only instrument that uses the pitot tube?

8. What indications can be observed when the alternate static source is used?

9. What instrument uses aneroid wafers?

10. How does the altimeter work?

11. What are some different types of airspeeds?

12. What happens if the pitot tube is blocked and the drain hole? And the static port is open?

13. What are the two fundamental properties of gyroscopic action?

14. What does rigidity in space mean?

15. What does precession mean?

16. What is the normal amount of vacuum pressure?

17. What is the difference between deicing and anti-icing?

Lesson 28
Homework Assignment

1. What is the purpose of a soft field landing?

2. What is the minimum altitude at which steep turns can be performed?

3. Are brakes recommended for a soft field landing?

4. What is aerodynamic braking?

5. Position lights are required to be on during what period?

6. What are runway end identifier lights (REIL)?

7. Describe a runway centerline lighting system.

8. What is an ADIZ?

9. What do you need to get into Class A airspace?

10. What do you need to do to get into Class B airspace?

11. What do you need to get into Class C airspace? Class D?

12. What does it mean if the rotating beacon is on during the daytime?

13. What is the meaning of the numbers on the approach end of the runway?

14. How can you determine at night whether an airport you are approaching is a civilian or military airport?

15. How far are you required to remain separated from other aircraft during flight? (91.113)

Lesson 29
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage III check.

Lesson 30
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage II check.

Lesson 31
Homework Assignment

1. What is a stall?

2. Does the engine stop when an airplane stalls?

3. Can an airplane stall at a level pitch attitude?

4. How does weight affect stall speed?

5. Why does the airplane pitch down when it stalls?

6. What is the primary purpose of the rudder during a stall recovery?

7. What cues may be useful in recognizing an approaching stall?

8. What is a spin?

9. What are the stages of a spin?

10. What two conditions must exist in order for a spin to occur?

11. Why do we bring power to idle during a spin recovery?

Lesson 32
Homework Assignment

Listen to Live ATC for any airport you desire. Note the times and attempt to write down seven controller instructions. Review any instructions that you did not understand with your instructor.

AIRPORT_____ DATE_____ ZULU TIME_____
1.

AIRPORT_____ DATE_____ ZULU TIME_____
2.

AIRPORT_____ DATE_____ ZULU TIME_____
3.

AIRPORT_____ DATE_____ ZULU TIME_____
4.

AIRPORT_____ DATE_____ ZULU TIME_____
5.

AIRPORT_____ DATE_____ ZULU TIME_____
6.

AIRPORT_____ DATE_____ ZULU TIME_____
7.

Lesson 33
Homework Assignment

1. Define and explain each space/block of the following METAR.

METAR KLAX 140651Z AUTO 0000KT 1SM R35L/4500V6000FT -RA BKN 030 10/10 A2990 RMK AO2

2. What are the different types of METAR's? How often are METAR's issued? For what type of flight or distance would a METAR be useful?

3. Define and explain each space/block of the following PIREP.

UUA/OV ABQ090045/TM 1430/FL130/TP BE30/TB SEV/RM BROKE ALL THE BOTTLES IN THE BAR

4. What are the three different types of PIREP's? How would you give a PIREP?

5. Define and explain each space/block of the following Radar Weather Report.

TLX1935 LN 8TRW++ 86/40 164/60 20W C2425 MTS570 AT 159/65 AUTO

6. Define and explain each space/block of the following Terminal Area Forecast.

KFPR 111140Z 111212 13012KT P6SM BK110 WS020/35035KT TEMPO 1214 5SM BR
FM1500 16015G25KT P6SM SCT040 BKN250
FM0000 14012KT P6SM BK080 OVC150 PROB40 3SM TSRA BKN030CB
FM0400 14008KT P6SM SCT040 OVC080 TEMPO 0408 3SM TSRA OVC030CB
BECMG 0810 32007KT

7. For what type/distance of flight would a TAF be used? How long are TAF's valid for and how often are they issued?

8. What are the different sections of an Area Forecast? How often are Area Forecasts issued?

9. How often do Winds and Temperature Aloft Forecasts issued? What altitude are winds and temperatures excluded due to surface friction/interference?

10. Who would issue a Center Weather Advisory? How long is a CWA valid for?

11. For aviation purposes, ceiling is defined as the height above the Earth's surface of the

A. lowest reported obscuration and the highest layer of clouds reported as overcast.
B. lowest broken or overcast layer or vertical visibility into an obscuration.
C. lowest layer of clouds reported as scattered, broken or thin.

12. To best determine general forecast weather conditions over several states, the pilot should refer to

A. Aviation Area Forecasts.
B. Weather Depiction Charts.
C. Satellite Maps.

13. Radar Weather reports are of special interest to pilots because they indicate

A. large areas of low ceilings and fog.
B. location of precipitation along with type and intensity.
C. location of broken to overcast clouds.

14. What values are used for Winds Aloft Forecasts?

A. Magnetic direction and knots.
B. Magnetic direction and miles per hour.
C. True direction and knots.

15. The section of the Area Forecast entitled ‘SIG CLDS AND WX’ contains a summary of

A. Cloudiness and weather significant to VFR flight operations broken down by states or other geographical areas.
B. Forecast sky cover, cloud tops, visibility, and obstructions to vision along specific routes.
C. Weather advisories are still in effect at the time of issue.

Lesson 34
Homework Assignment

1. What type of medical do you hold? How long is your medical valid? How long are the privileges valid?

2. What recent flight experience and currency issues must a private pilot consider when logging pilot in command time with passengers on board for a VFR night flight?

3. For a flight not in the vicinity of the airport of departure, what pre-flight action must you consider?

4. When must flight crewmembers wear their seat belts? When must passengers wear their safety belts?

5. List the Minimum Safe Altitudes for flight anywhere, over congested areas, and over other than congested areas.

6. When flying to an airport that has an operating control tower in Class G airspace, would you need to contact tower for operations in the traffic pattern?

7. What are the basic fuel requirements for a VFR flight per the FAA?

8. Beginning with 91.205, list all the required equipment needed on the aircraft to operate out of RIC for a training flight and back in VFR day conditions.

9. List all the required inspection and certificates need on board the aircraft for a VFR night flight.

10. If you were involved in an aircraft incident with an in flight fire, would you have to report it? If so, within what time frame?

11. May a student pilot log pilot in command time?

12. Is steep turns a fixed power maneuver?

13. Where is the windsock, wind tee, or wind cone located on an airport without an operating control tower? (AIM 4-3-4)

14. What direction must all turns be made if you are in the vicinity of a Class G airport for the purpose of landing? (91.126)

Lesson 35
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage IV check.

Lesson 36
Homework Assignment

Review your homework and ask your Instructor any questions in preparation for the Stage IV check.