

GLEIM PILOT REFRESHER COURSE

STUDY UNIT NINE

ORAL EXAM GUIDE

9.1	Private Pilot	1
9.2	Sport Pilot	19
9.3	Commercial Pilot	21

The oral exam guide that follows addresses the subjects that are covered in the ground training portion of a typical flight review. The examiner will obviously not ask you each of the 200+ questions in this guide and may combine several ideas into a single scenario. The guide presented here will give you an overall idea of what to expect during your flight review and assist you in preparing for the discussion. All pilots should review the Private Pilot section of this guide. Sport and commercial pilots should also review Subunits 2 and 3 as appropriate.

9.1 PRIVATE PILOT

1. **What certificates and documents must be on board the aircraft for it to be considered legal?**
 - A. Remember A.R.R.O.W. Airworthiness certificate, Registration, Radio station license (if you are flying outside the U.S.), Operating limitations, and Weight and balance.
2. **What are the items required to be carried with you in order to act as pilot in command (PIC)?**
 - A. To act as PIC of an aircraft, you are required to carry your pilot's certificate, a valid medical certificate, and a government-issued photo ID (e.g. passport or state-issued driver's license).
3. **What are the limitations regarding flying for hire for a private pilot?**
 - A. A private pilot cannot act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire. A private pilot must pay at least an equal (pro rata) share of the operating expenses of a flight carrying passengers.
4. **How long is a third-class medical certificate valid? A second-class? A first-class?**
 - A. A third-class medical certificate is valid until the end of the 60th calendar month following the date of the examination if you were under 40 years of age on the day of the medical exam. If you were 40 years old or older on the day of the exam, then the certificate is valid until the end of the 24th calendar month following the date of the examination. A second-class medical certificate is valid for operations requiring a commercial pilot certificate for 12 months following the date of the examination, regardless of age. A first-class medical certificate is valid for operations requiring an airline transport pilot certificate for 6 months, or for operations requiring a commercial pilot certificate for 12 months, following the date of the examination, regardless of age.
5. **What class medical certificate must you have to apply for a certificate or rating?**
 - A. To apply for a certificate or rating, you are required to have a third-class medical certificate.

6. **What is required to act as PIC of a complex, high performance, or tailwheel airplane?**
 - A. To act as PIC of a complex, high performance, or tail-wheel airplane, you are required to receive and log ground and flight training and obtain a logbook endorsement from an appropriately rated CFI.
7. **What is required to act as PIC of a turbojet-powered aircraft, or one with a gross weight over 12,500 lbs.?**
 - A. To act as PIC of a turbojet-powered aircraft, or one with a gross weight of over 12,500 lbs., you are required to have a type rating.
8. **What is a flight review? Within what time period must a flight review have been satisfactorily completed in order to act as PIC?**
 - A. A flight review is a minimum of one hour of ground training and one hour of flight training that must have been completed within the preceding 24 calendar months for you to be able to act as PIC. Alternatively, you may have passed a pilot proficiency check conducted by an examiner/inspector, a company check airman, or a U.S. Armed Force, for a pilot certificate, rating, or operating privilege within the preceding 24 calendar months.
9. **What must be done to remain current to act as PIC of an aircraft carrying passengers?**
 - A. To act as PIC of an aircraft carrying passengers, you must complete three takeoffs and landings (to a full stop in a tailwheel airplane) every 90 days, and complete a flight review every 24 calendar months. To carry passengers at night, you must complete three landings to a full stop at night every 90 days.
10. **Define category, class, and type.**
 - A. Category is the broad classification of aircraft that includes airplane, glider, rotorcraft, and lighter-than-air. Class refers to aircraft having similar operating characteristics, such as single-engine, multi-engine, land, and sea. Type refers to a specific make and model of aircraft.
11. **What flight experience must be entered into a pilot logbook?**
 - A. The only flight experience that is required to be entered into a pilot logbook is that experience which is required for obtaining a certificate or rating, completing a flight review, or meeting recency of experience requirements.
12. **What type of airframe inspections is an aircraft required to have undergone to be considered airworthy?**
 - A. An aircraft must have undergone an annual inspection within the preceding 12 calendar months to be considered airworthy if it is used for non-commercial operations. If an aircraft is used for commercial operations, it is also required to have been through an inspection within the preceding 100 hours.
13. **Is an airplane owner who is not an A&P mechanic allowed to perform any type of maintenance on his/her airplane?**
 - A. Yes. An airplane owner who is not a certified mechanic is allowed to perform preventive maintenance, such as oil changes.
14. **How often must a transponder be tested and inspected to be considered airworthy?**
 - A. You may not operate a transponder unless it has been inspected and tested within the preceding 24 calendar months.
15. **What is an STC? When is an STC required?**
 - A. An STC is a Supplemental Type Certificate. An STC is required whenever there is a major change or modification made to the airplane that doesn't warrant a new type certificate.
16. **Who is responsible for keeping the airplane in an airworthy condition?**
 - A. The owner or operator is responsible for making sure the airplane is kept in an airworthy condition.

17. **What is an Airworthiness Directive (AD)? Why are they issued?**
- A. An AD is issued by the FAA when there is a safety issue with a particular type of aircraft. ADs are mandatory and must be complied with within a certain time frame, unless the AD specifically indicates otherwise.
18. **What type of maintenance records is the owner required to keep for an aircraft?**
- A. Maintenance records must be kept for the current status of life-limited parts (propeller, engine, etc.), the current status of all ADs, and any preventive maintenance done by the pilot.
19. **What are the minimum fuel requirements for flight in VFR conditions?**
- A. During the day, the FARs require that the aircraft possess sufficient fuel to fly to the first point of intended landing and then for an additional 30 min., assuming normal cruise. At night, the aircraft must possess fuel sufficient to fly for an additional 45 min.
20. **What instruments and equipment are required for day VFR flights?**
- A. Tachometer, MAP gauge (if equipped), oil pressure gauge, oil temp, fuel gauge, altimeter, airspeed indicator, magnetic direction indicator, anticollision light, ELT, seatbelts, flotation gear (if over water) and landing gear indicator lights (if equipped).
21. **What instruments and equipment are required for night VFR flights?**
- A. All day VFR equipment plus fuses (one spare set, or three of each kind), landing light (if operating for hire), anticollision light system, position lights (navigational lights), and source of electrical energy (battery).
22. **Must you notify the FAA of a change of address?**
- A. Yes. If your address changes, you must notify the FAA in writing within 30 days, or you may not exercise the privileges of your pilot certificate.
23. **Define the responsibility and authority of the pilot in command.**
- A. The pilot in command is the final authority as to the operation of the aircraft. (S)he is responsible for the safety of the crew and all passengers on board the aircraft.
24. **How long must one wait after consuming alcohol before acting as a required crewmember on a civil airplane?**
- A. You must wait eight hours after consuming alcohol before acting as a required crewmember on a civil airplane.
25. **What is the maximum allowable blood alcohol content while acting as a required crewmember on a civil airplane?**
- A. You may not act as a required crewmember on a civil aircraft while having .04% by weight or more blood alcohol content.
26. **Above what altitude must all passengers be provided with supplemental oxygen?**
- A. All passengers must be provided with supplemental oxygen when the cabin altitude is above 15,000 ft. MSL. The required flight crew must be provided with and use supplemental oxygen for all time in excess of 30 minutes spent above 12,500 ft. MSL, and for the entire time spent above 14,000 ft. MSL.
27. **Within what time frame must an accident report be filed with the National Transportation Safety Board (NTSB)?**
- A. You are required to notify the NTSB immediately when an aircraft accident (an occurrence that results in death or serious injury to any person, or substantial damage to the aircraft) occurs. A report must be filed within 10 days after an accident.

28. Is damage to the landing gear or tire considered substantial damage by the NTSB?

- A. Damage to a tire or landing gear is not considered substantial damage, and a report to the NTSB is not required. A definition of exactly what is and is not considered substantial damage is found in NTSB Part 830.

29. Which occurrences require immediate notification to the NTSB?

- A. You must immediately notify the NTSB when an aircraft accident or any of the following incidents occur: the inability of a required crewmember to perform his/her duties, an in-flight fire, a flight control system malfunction, a mid-air collision, failure of the structural components of a turbine engine (excluding compressor and turbine blades/vanes), damage to property (other than the aircraft) in excess of \$25,000, or when an aircraft is overdue and is believed to have been involved in an accident.

30. How is a “serious injury” defined by the NTSB?

- A. A serious injury is defined by NTSB Part 830 as an injury requiring hospitalization for more than 48 hours, most bone fractures, muscle or nerve damage, internal organ damage, second or third degree burns, or any burns, affecting over 5% of the body.

31. When are safety belts required to be worn by all occupants?

- A. Safety belts and shoulder harnesses, if installed, are required to be worn by all occupants during taxi, takeoff, and landing.

32. As PIC, what is your responsibility to your passengers with regard to safety belts?

- A. As PIC, you must brief your passengers on the operation of the safety belts, and notify your passengers when belts must be worn.

33. What is a NASA Aviation Safety Reporting Program (ASRP) report? When should one be filed?

- A. The NASA ASRP is a voluntary program designed to gather information about deficiencies in the aviation system. When an FAR is violated inadvertently without involving a criminal offense, filing a NASA ASRP report within 10 days may prevent an enforcement action.

34. What is a weather-based scenario?

- A. The FAA is changing its focus on weather theory and weather services to a more scenario-based system. This means that questions on the oral portion of the practical test will be related to a hypothetical weather situation. For example, your examiner may ask you about the expected weather along your flight route for the pre-planned cross-country.

35. What is standard sea level temperature and pressure?

- A. Standard sea level temperature is 15°C. Standard sea level pressure is 29.92" Hg. These numbers are important for completing important calculations, such as true airspeed, current lapse rate, and density altitude.

36. What is the standard lapse rate?

- A. The standard lapse rate is 2°C per 1,000 ft. of altitude gained.

37. What is the Coriolis force?

- A. The Coriolis force is a theory that explains how things deflect to the right in the Northern Hemisphere. It applies to wind, pressure, and general weather patterns. The Coriolis force is the reason wind and weather patterns generally move from west to east (left to right) in the United States.

38. Why is wind shear dangerous?

- A. Wind shear is dangerous because it is unpredictable, and it can cause significant changes in heading, airspeed, and altitude, especially close to the ground.

39. **What is the significance of a close temperature-dew point spread?**
- A. A close temperature-dew point spread indicates the probable formation of visible moisture in the form of dew, mist, fog, or clouds. The decrease in temperature (most frequently at night) can result in a close temperature-dew point spread and fast forming fog.
40. **What are the characteristics of stable air? What are the characteristics of unstable air?**
- A. Stable air is characterized by continuous precipitation, smooth air, and poor visibility. Unstable air is characterized by showery precipitation, rough air, and good visibility.
41. **What are the three types of fronts and what significance is this to aviation?**
- A. The three types of fronts are cold front, warm front, and stationary front. Each front indicates a different type of weather.
42. **What type of weather is associated with a cold front?**
- A. Cold fronts usually contain the most volatile weather. Because cold air replaces warm air quickly, the difference in pressure is the greatest with the potential for violent weather.
43. **What type of weather is associated with a warm front?**
- A. The weather associated with a warm front is usually relatively mild. Warm front weather is usually much more widespread and longer lasting than that of cold front weather.
44. **What type of weather is associated with a stationary front?**
- A. A stationary front is when warm and cold air masses meet, but do not mix. Wind always blows along the frontal boundary of a stationary front, and in some cases embedded storms occur.
45. **What is an occluded front?**
- A. An occluded front is a combination of cold, warm, and cool air. Thus, weather in occluded fronts are a combination of cold and warm front weather.
46. **What is clear air turbulence? Why is it dangerous?**
- A. Clear air turbulence is turbulence not associated with thunderstorms. It usually occurs along an upper level temperature inversion. It is dangerous because it is often unexpected, and it can be severe.
47. **What are three types of structural icing?**
- A. The three types of structural icing are clear, rime, and mixed ice. Clear ice forms when drops are large as in rain or in cumuliform clouds. It is hard, heavy, and unyielding. Rime ice forms as a result of small drops found in stratified clouds and drizzle. Air becomes trapped in between the drops and makes the ice appear white. Mixed ice is a combination of clear and rime ice.
48. **How much can ice or frost degrade performance?**
- A. It is important not to operate with frost on the wings because it can degrade performance by up to 40%.
49. **What are the types of fog and how are they formed?**
- A. The fog types include radiation, advection, precipitation-induced, upslope, and ice. Radiation fog forms when the air close to the ground is cooled faster than the air above it. It usually forms at night or near daybreak. Advection fog forms along coastal areas when the water is warmer than the air around it. Precipitation-induced fog forms when relatively warm rain or drizzle falls through cool air and evaporation from the precipitation saturates the cool air. Upslope fog forms as a result of moist, stable air being cooled adiabatically as it moves up sloping terrain. Ice fog occurs in cold weather when the temperature is well below freezing and water vapor sublimates directly as ice crystals.

50. What conditions must be present for a thunderstorm to form?

- A. Formation of a thunderstorm requires a lifting action, an unstable lapse rate, and sufficient water vapor.

51. What is a microburst? Why is it hazardous to aircraft? How long does a microburst typically last?

- A. A microburst is a heavy downdraft occurring within a thunderstorm. It is hazardous to aircraft because of the extreme down force. The downdrafts become stronger outflowing horizontal surface winds flowing outward from the base of the thunderstorm. A microburst usually lasts for a total of 10 minutes with the maximum intensity winds lasting for 2 to 4 minutes.

52. What type of flying weather do low-pressure systems present?

- A. Low-pressure systems are quite often regions of poor flying weather, and high-pressure systems are predominantly regions of favorable flying weather.

53. Where is weather information available on the ground?

- A. Weather information is available on the ground from a Flight Service Station (FSS), Direct User Access Terminal System (DUATS), and Telephone Information Briefing Service (TIBS). You can speak to a pre-flight briefer at FSS and/or receive TIBS by calling 1-800-WX-BRIEF anywhere in the country. DUATS is a free service available to pilots on the Internet. Here you can receive weather information, and file a flight plan. TIBS is recorded weather information that can be obtained by calling 1-800-WX-BRIEF.

54. Where is weather information available in-flight?

- A. Weather information is available in-flight with

HIWAS	Hazardous In-Flight Weather Advisory Service
FSS	Flight Service Stations
TWEB	Transcribed Weather Broadcast
ATIS	Automatic Terminal Information Service
ASOS	Automated Surface Observation Service
AWOS	Automatic Weather Observation Service

You can file a PIREP and obtain numerous types of weather information with FSSs. HIWAS is a recorded briefing of hazardous weather over select VOR frequencies. FSS may be contacted at 122.2 MHz. Additional frequencies are shown on navigational charts and are usually available for ATC. TWEB is a recorded broadcast of current and adverse weather conditions over select VOR frequencies. ATIS is recorded weather information for a terminal area. AWOS and ASOS are automated weather reporting stations found at many airports.

55. What is a METAR?

- A. A METAR is a current weather observation that is updated at a regular interval, and applies to a 5-mile radius around the observation point (usually at any airport), reporting wind, visibility, storm activity, ceilings, temperature, altimeter setting, and remarks.

56. What is a TAF? How often are TAFs updated?

- A. A TAF is a forecast of conditions for the next 24 hours (30 hours at the largest U.S. airports) that applies to a 5-mile radius around an airport. TAFs are updated four times a day and report wind, visibility, significant weather, sky condition, and possible wind shear.

57. How do TAFs indicate wind shear?

- A. TAFs indicate forecasted wind shear with the code WS after the sky conditions segment.

58. **What is a PIREP? How is one submitted? How can a pilot receive one?**
- A. A PIREP is a Pilot Weather Report. PIREPs are important sources of observed weather aloft. PIREPs are submitted by pilots to an FSS.
59. **What type of information can be found in an area forecast (FA)? How often is an area forecast updated? What are the four sections of an area forecast?**
- A. An area forecast (FA) is a forecast of clouds and general weather conditions over an area of several states, and is updated three times a day. An FA contains four sections, the communication and product header, precautionary statement, synopsis, and VFR clouds/weather section. The communication and product header indicates the date and time of issuance, valid times, and area of coverage. The precautionary statement icing, low-level wind shear, and IFR conditions, and non-MSL heights are denoted by AGL or CIG. The synopsis is a brief summary of the location and movement of fronts, pressure systems, and circulation patterns. The VFR clouds/weather section contains a 12-hr. specific forecast and a 6-hr. outlook and covers possible weather hazards such as IFR conditions, icing, thunderstorms, and wind shear.
60. **What is the difference between a Radar summary chart and a visible satellite report?**
- A. A Radar summary chart displays areas of precipitation, as well as information about the type, intensity, configuration, coverage, echo top, and cell movement of that precipitation. A visible satellite report is a type of imagery of clouds and their thickness.
61. **What is a SIGMET? What is a convective SIGMET? What is an AIRMET?**
- A. SIGMETs are issued for all aircraft and may include severe icing not associated with thunderstorms, clear air turbulence, dust storms, and volcanic eruptions. Convective SIGMETs are issued for severe thunderstorms, embedded thunderstorms, lines of thunderstorms, and tornadoes, all of which imply severe or greater turbulence, severe icing, and low-level wind shear. AIRMETs are issued for moderate icing, moderate turbulence, IFR conditions over 50% of an area, sustained surface winds of 30 kt. or greater, nonconvective low-level windshear, and mountain obscuration.
62. **What do winds and temperatures aloft forecasts indicate? What can a pilot determine from these forecasts?**
- A. Winds and temperatures aloft forecasts indicate the wind speed and direction, as well as temperature, at various altitudes. Pilots are interested in most favorable winds and temperature inversions.
63. **What is a Center Weather Advisory?**
- A. A Center Weather Advisory is an advisory provided by ATC for potentially hazardous weather expected to happen within the next 2 hours.
64. **What are the minimum VFR cloud clearance and visibility requirements for Class E airspace below 10,000 ft. MSL? What are they above 10,000 ft. MSL?**
- A. The minimum VFR cloud clearance and visibility requirements in Class E airspace below 10,000 ft. MSL are 500 ft. below clouds, 1,000 ft. above clouds, 2,000 ft. horizontally from clouds, and 3 miles visibility. The minimum VFR cloud clearance and visibility requirements in Class E airspace above 10,000 ft. MSL are 1,000 ft. below clouds, 1,000 ft. above clouds, 1 SM horizontally from clouds, and 5 miles visibility.
65. **How is Class E airspace that extends to the surface depicted on sectional charts? How is Class E to 700 ft. AGL depicted?**
- A. Class E airspace that extends to the surface is indicated on a sectional chart by the dashed magenta line surrounding the airport. Class E airspace that extends to the surface of an airport signifies that the airport has instrument approach procedures. Class E to 700 ft. AGL is indicated by a shaded magenta ring. Class E airspace that begins at 700 ft. AGL is used for transitioning aircraft operating under IFR to/from the terminal or en route environment.

66. **What airspace designation do Federal Airways have? What are the dimensions of a Federal Airway?**
- A. Federal Airways are an example of Class E airspace. A Federal Airway extends upward from 1,200 ft. up to, but not including, 18,000 ft. MSL.
67. **What are the minimum VFR cloud clearance and visibility requirements for Class G airspace below 1,200 ft. AGL during the day? What are they at night?**
- A. The minimum VFR cloud clearance and visibility requirements in Class G airspace below 1,200 ft. AGL during the day are clear of clouds and 1 mile visibility. The minimum VFR cloud clearance and visibility requirements in Class G airspace below 1,200 ft. AGL at night are 500 ft. below clouds, 1,000 ft. above clouds, 2,000 ft. horizontally from clouds, and 3 miles visibility.
68. **What are the minimum VFR cloud clearance and visibility requirements for Class G airspace above 1,200 ft. AGL but below 10,000 ft. MSL during the day? What are they at night?**
- A. The minimum VFR cloud clearance and visibility requirements in Class G airspace above 1,200 ft. AGL but below 10,000 ft. MSL during the day are 500 ft. below clouds, 1,000 ft. above clouds, 2,000 ft. horizontally from clouds, and 1 mile visibility. The minimum VFR cloud clearance and visibility requirements in Class G airspace above 1,200 ft. AGL but below 10,000 ft. MSL at night are 500 ft. below clouds, 1,000 ft. above clouds, 2,000 ft. horizontally from clouds, and 3 miles visibility.
69. **What are the minimum VFR cloud clearance and visibility requirements for Class B airspace? What are they for Class C airspace? What are they for Class D airspace?**
- A. The minimum VFR cloud clearance and visibility requirements in Class B airspace are clear of clouds and 3 miles visibility. The minimum VFR cloud clearance and visibility requirements in Class C and Class D airspace are 500 ft. below clouds, 1,000 ft. above clouds, 2,000 ft. horizontally from clouds, and 3 miles visibility.
70. **What class of airspace requires a clearance prior to entry? What classes of airspace require that 2-way radio communication be established prior to entry?**
- A. Class B airspace requires a clearance prior to entry, and Class C and Class D airspace require that 2-way radio communication be established prior to entry.
71. **How do you determine when 2-way radio communication has been established?**
- A. Two-way radio communication has been established when ATC responds with your correct call sign.
72. **When is a transponder with Mode C required for VFR flight?**
- A. A working transponder with Mode C is required any time you are above 10,000 ft. MSL, inside Class B or Class C airspace, and above Class B or Class C airspace up to 10,000 ft. MSL, or within 30 NM of a Class B primary airport.
73. **What are the typical dimensions of Class D airspace?**
- A. Class D airspace typically extends upward from the surface to 2,500 ft. AGL and outward to a 5 SM radius from the primary airport. Airspace dimensions may vary according to local requirements, however.
74. **What are the typical dimensions of Class C airspace?**
- A. Class C airspace is typically composed of two sections that are referred to as the surface area and the shelf area. The surface area typically extends upward from the surface to 4,000 ft. MSL and outward to a 5 NM radius upward from the primary airport. The shelf area typically extends upward from 1,200 ft. MSL to 4,000 ft. MSL and outward to a 10 NM radius from the primary airport. Airspace dimensions may vary according to local requirements, however.

75. **What is a TRSA?**
- A. TRSA stands for Terminal Radar Service Area. TRSAs are established around Class D airports that have radar service capability, but do not meet all of the criteria to be designated as Class C airspace. Participation in TRSA service is voluntary (though it is recommended), but 2-way radio communication must still be established prior to entering Class D airspace.
76. **What are the minimum cloud clearance and visibility requirements to obtain a special VFR clearance?**
- A. To obtain a special VFR clearance, you must be able to remain clear of clouds and have at least 1 mile visibility. Flight under special VFR at night is only permitted if the pilot has an instrument rating and the aircraft is IFR equipped.
77. **What is a Prohibited Area? What is a Restricted Area? What is a Military Operations Area? What is an Alert Area? What is a Warning Area?**
- A. Prohibited Areas are established for reasons of national security; flight is prohibited at all times within them. Restricted Areas are established to contain unusual, often invisible hazards to aircraft such as aerial gunnery or missile tests. Flight is restricted within a Restricted Area when that area is active. Military Operations Areas (MOAs) are established to separate IFR and military traffic. VFR flight is always permitted within MOAs. Alert Areas are established to notify pilots of unusual aerial activity such as a high volume of flight training but flight is always permitted within them. Warning areas are located offshore and are established to alert pilots.
78. **When should you contact ATC after leaving from an uncontrolled satellite airport located in Class C or Class D airspace?**
- A. After departing an uncontrolled satellite airport in Class C or Class D airspace, contact ATC as soon as practicable.
79. **What is a Military Training Route (MTR)?**
- A. Military Training Routes are depicted on sectional charts to alert pilots to establish flight paths used for military training, usually occurring at high speeds and low altitudes.
80. **What procedure should a pilot use to depart the traffic pattern of a nontower airport?**
- A. At an airport without an operating control tower, you should depart the pattern straight out or with a 45 degree turn in the direction of traffic after reaching pattern altitude. You should state which departing procedure you intend to use when you make your takeoff call on the CTAF frequency.
81. **What procedure should a pilot use to enter the traffic pattern of a nontower airport?**
- A. Inbound pilots are expected to observe other aircraft in the pattern to conform to the traffic pattern in use. If there is not any traffic in the pattern, the pilot should overfly the airport at least 500 ft. above pattern altitude to observe traffic and wind indicators on the ground. All entries to a nontower airport's traffic pattern should be a 45 degree turn to the downwind entry.
82. **What information do Airport/Facilities Directories provide?**
- A. Airport/Facilities Directories (A/FD) provide all the information needed for an airport or radio navigation aid (NAVAID). A/FDs also provide published NOTAMs and areas of parachute and aerobatic activity.
83. **What type of information do sectional charts provide?**
- A. Sectional charts provide topographical, physical (roads, railroad tracks, etc.), airport, NAVAID, and airspace information for a specific geographic location.

84. **What information does the *Aeronautical Information Manual (AIM)* provide?**
- A. The *AIM* provides information regarding airport operations, navigation aids, airspace, flight operations, and ATC procedures.
85. **Where can pilot certification information be found?**
- A. Pilot certification information can be found in FAR part 61.
86. **Where can information on oxygen requirements, fuel requirements, airspace, and all other regulatory flight rules be found?**
- A. All flight rules that apply to general aviation are in FAR part 91.
87. **What is an Advisory Circular (AC)?**
- A. ACs are used by the FAA as a means of issuing nonregulatory information to pilots, mechanics, and manufacturers.
88. **How is density altitude calculated?**
- A. To calculate density altitude
1. Obtain the field elevation
 2. Barometric pressure: Add (if below standard) or subtract (if above standard) to obtain pressure altitude. For example, if the field elevation is 2,000 ft. and the barometric pressure is 30.00, you will subtract 80 ft. $(30.00 - 29.92 \times 100)$ from 2,000.
 3. Line up the pressure altitude and temperature on your flight computer to find density altitude. If temperature is above standard, density altitude will be greater than pressure altitude; the opposite will occur if temperature is below standard.
89. **What are the typical performance charts found in a POH?**
- A. Performance charts common to all POHs include takeoff, climb, cruise, landing, maximum glide chart, and the density altitude chart. You should be proficient with each of the performance charts in your POH. Be able to use each chart and explain it to your examiner.
90. **How does density altitude affect airplane performance?**
- A. High density altitude has a noticeably negative effect on aircraft performance. First, because the air going into the engine is not as dense with high density altitude, the engine does not develop as much power. Second, the propeller is an airfoil and does not develop as much thrust in the thinner air at high density altitude. Third, at high density altitude, the wing is not as efficient, and therefore requires more airflow to produce the same amount of lift as would be produced at lower density altitudes. Thus, high density altitude has a negative effect on your takeoff roll, climb rate, and cruise performance.
91. **What are some factors that affect takeoff performance?**
- A. The common factors that affect takeoff performance are density altitude, the weight of the aircraft, wind speed and direction, and the surface of the runway. With a higher density altitude, the aircraft will have a longer takeoff roll. Increased weight also increases the takeoff roll. If the wind speed is high and it is close to a headwind, the ground roll will be reduced because of the increased relative wind. Finally, a soft runway surface will make the takeoff roll longer.
92. **What is maximum range? What is maximum endurance?**
- A. Maximum range is the maximum distance an aircraft can fly on full fuel. Maximum endurance is the maximum time an aircraft can fly on full fuel.
93. **What is the definition of best glide speed?**
- A. Best glide speed is the point in the drag curve in which total drag is the lowest, or L/DMAX.

94. What are some factors that affect landing distance?

- A. The most common factors that affect landing distance are wind speed and direction, the runway surface, and the weight of the airplane. The stronger the headwind, the slower the airplane's normal speed at landing and the shorter the landing distance. A poor runway surface decreases braking efficiency. A heavier airplane has more inertia and requires more landing distance.

95. Define center of gravity (CG).

- A. The center of gravity is the point at which the airplane would be balanced if it were possible to suspend it from that point. It is calculated by dividing the sum of the moments by the sum of the weights.

96. How is the center of gravity (CG) for an airplane calculated?

- A. The center of gravity is calculated by dividing the airplane's total moment by the total weight. Total moment is the sum of the products of the weight of each item in the airplane, e.g., occupant, baggage, fuel, etc., times the arm. Arm is the distance of the item from the datum.

97. What are some of the effects that being over gross weight can have on an airplane?

- A. Being over gross weight is illegal and very dangerous. It can increase the takeoff and landing distance, decrease climb performance, cause possible structural damage, and accelerate metal fatigue.

98. Where are the measurements taken for the computation of the CG?

- A. The CG is computed from the reference datum, which is defined by the airplane manufacturer. It is frequently the firewall or the leading edge of the wing.

99. What are the handling characteristics of an airplane with an aft CG?

- A. An airplane with an aft CG is generally unstable. It will fly at a higher airspeed, but it may be impossible to recover from a stall or spin.

100. What are the handling characteristics of an airplane with a forward CG?

- A. An airplane with a forward CG is generally more stable than one with an aft CG. It will fly at a slower airspeed (more drag), and it will stall at a higher indicated stall speed.

101. Why should a weight and balance be calculated with both current conditions and with zero or low fuel under the given conditions before departing?

- A. Before beginning any flight, you must compute a weight and balance with the current conditions. However, as fuel burns during a flight, the CG moves. To make sure the CG will stay within limits the entire flight, you should calculate a theoretical weight and balance with no or low fuel as well.

102. Define moment.

- A. A moment is a tendency that causes an object to rotate about some axis. Moment is the result of the weight of an object multiplied by its arm.

103. Define arm.

- A. Arm is the distance (usually in inches) from a reference datum to the center of gravity.

104. What is the difference between the moment and the arm?

- A. The arm is the distance from the datum to the center of the item for which the moment is being calculated. The moment is the product of the weight of the object being measured and its distance from the datum (arm).

105. Which flight instruments are part of the pitot-static system?

- A. Typically, the airspeed indicator, vertical speed indicator, and altimeter are the flight instruments in the pitot-static system.

106. Which instruments are driven by a vacuum pump?

- A. Typically, the gyros in the attitude indicator and heading indicator are driven by the vacuum system.

107. What are the definitions of four types of airspeeds?

- A. Indicated airspeed is what is read on the airspeed indicator. Calibrated airspeed is determined by engineers and has no practical use for pilots. However, many performance charts are listed in calibrated airspeed and a chart that gives indicated versus calibrated must be used to determine the indicated airspeed. True airspeed is calibrated airspeed or indicated airspeed corrected for non-standard temperature and pressure. True airspeed at higher altitudes are higher than shown on the airspeed indicator due to the higher density altitude, which means less dense air. Ground speed is the actual speed in which you are moving over the ground.

108. Define the different types of altitude.

- A. Altitude types include indicated, true, pressure, absolute, and density. Indicated altitude is read directly from the altimeter after it is set to the local altimeter setting. True altitude is the vertical distance of the aircraft above sea level. Pressure altitude is the altitude indicated on the altimeter when the altimeter setting is adjusted to standard pressure. It is also indicated altitude or actual altitude adjusted for nonstandard pressure. Absolute altitude is the height of the aircraft above the surrounding terrain (i.e., the height above ground level, or AGL). Density altitude is pressure altitude corrected for nonstandard temperature.

109. How does the vertical speed indicator (VSI) work?

- A. The VSI is a sealed case with a calibrated leak and a diaphragm inside it. Slight difference in air pressure expands or contracts the diaphragm that is linked to the needles on the face of the instrument.

110. How does the altimeter work?

- A. As the plane ascends or descends, the changing atmospheric pressure allows the aneroid wafers inside the altimeter to expand or contract. This expansion/contraction is mechanically geared to rotate the needles on the face of the instrument.

111. How does the airspeed indicator work?

- A. The airspeed indicator takes the difference between the ram air pressure from pitot tube, and the static pressure from the static vents, and converts this pressure difference into indicated airspeed.

112. How do the gyroscopic instruments work?

- A. Gyroscopic instruments work on the principle of rigidity in space. A vacuum pump or electrical power source spins a gyro in the instrument at a high rate of speed, thus keeping it rigid in space. If a force is applied, then precession happens 90° ahead of the force.

113. What errors are magnetic compasses subject to?

- A. Magnetic compasses are subject to magnetic variation, northerly and southerly turning, acceleration, and compass card oscillation errors.

114. What is magnetic variation?

- A. Magnetic variation is the difference in degrees between true and magnetic north. Although the magnetic field of the Earth lies roughly north and south, the Earth's magnetic poles do not coincide with its geographic poles, which are used in construction of aeronautical charts.

115. What is magnetic dip?

- A. Magnetic dip is the tendency of the compass needles to point down as well as point to the magnetic pole. The resultant error is known as dip error, greatest at the poles and zero at the magnetic equator. It causes northerly and southerly turning errors and acceleration errors.

116. What is northerly and southerly turning error?

- A. Northerly and southerly turning error is the most pronounced of the dip errors. If the airplane is on a northerly heading and turns east or west, the compass will lag. If the airplane is on a southerly heading and turns east or west, the compass will lead the actual airplane heading. REMEMBER, North Lags, South Leads.

117. What is acceleration error?

- A. Acceleration error is also due to the dip of the Earth's magnetic field. Because the compass is mounted like a pendulum, the aft end of the compass card is tilted upward when accelerating and downward when decelerating during changes of airspeed. When on east or west headings, acceleration causes compasses to indicate a turn to the north. Deceleration causes compasses to indicate a turn to the south. ANDS (Accelerate North, Decelerate South).

118. What is compass card oscillation?

- A. Compass card oscillation error results from erratic movement of the compass card, which may be caused by turbulence or abrupt flight control movement.

119. What is the purpose of a magneto? Why are there usually two magnetos in airplane engines?

- A. A magneto provides electrical current to the spark plugs. Most general aviation engines have two magnetos because there are two spark plugs per cylinder. Each magneto provides current to one set of spark plugs. The result is a redundant system and also better performance.

120. What is the function of the mixture control?

- A. The mixture controls the amount of fuel going to the carburetor or cylinders. It makes for better fuel efficiency, less wear on the spark plugs, and a more efficient engine.

121. What is the purpose of a carburetor? What is one of its limitations?

- A. The carburetor is where the fuel mixes with the air before it is sent to the cylinders. It is subject to induction icing.

122. How does the fuel system work on this airplane? How does the electrical system work? How do the brakes work?

- A. Learn how all the systems work on your airplane. Consult your POH and complete the worksheets on page 15 and 16.

123. When making power adjustments with a constant-speed propeller, what should be changed first?

- A. When making a power adjustment with a constant-speed propeller, it is important to keep the manifold pressure setting below the RPM setting. When decreasing power, always reduce manifold pressure before reducing RPM. When increasing power, always increase RPM before increasing manifold pressure.

124. What does the throttle control on an engine with a constant-speed prop? What does the propeller control operate?

- A. The throttle controls manifold pressure, and the propeller control operates RPM with a constant-speed propeller.

125. What are the steps to hand propping an airplane?

- A. Hand propping requires two people: one at the controls, and the other at the propeller. It is vital that both people be trained and experienced in hand propping technique. The person sitting behind the controls should have the brakes firmly held, the throttle positioned for start, and both mags switched to 'ON'. The person propping the airplane should yell, "Brakes on, throttle cracked, switched to 'ON'." The person behind the controls should reply in kind. Then the person propping the plane should verify that the brakes are set by pushing firmly on the propeller close to the spinner. With his/her fingers positioned just on the trailing edge of the propeller, the person propping should pull forcefully down and away from the propeller arc.

126. What are the 4 cycles of a normally aspirated, reciprocating engine?

- A. Intake, compression, power, and exhaust.

127. How does lift develop?

- A. Lift develops as a result of differential pressure between the upper and lower surfaces of the wing. The air that travels over the top of the wing must go farther and faster, and thus has a lower pressure than the air that travels under the bottom side of the wing. The pressure difference pulls the wing upward.

128. What is "load factor"?

- A. Load factor is the amount of force that the aircraft structure has to support. It is measured in "Gs" or "G-force", as a multiple of the aircraft's weight to the force of gravity, e.g., a 60° bank results in a 2G force.

129. Why should a pilot be wary of load factor? What are some situations that may result in high load factors?

- A. Exceeding the maximum load factor limits for the aircraft can result in structural damage. Additionally, as the load factor increases, so does the speed at which the aircraft will stall. Some situations involving high load factors include: level steep turns, aggressive control inputs at excessive speeds, and turbulence.

130. What is maneuvering speed?

- A. Maneuvering speed is the maximum speed at which full and abrupt control inputs can be made without exceeding design load factor limits. Accordingly, it is also the speed at which the airplane should be flown in turbulence.

131. What is adverse yaw? How is it corrected?

- A. Adverse yaw occurs in turns. As the airplane turns, the high, outside wing moves faster through the air than the inside wing. Because of this, the high wing creates more drag and pulls the nose of the airplane toward it. Adverse yaw can be corrected by using proper rudder control.

132. What is the purpose of flaps?

- A. Wing flaps create both lift and drag. They can be used to shorten the takeoff roll and/or to increase the descent angle on approach without increasing airspeed.

133. Why is more back pressure required to maintain level flight while turning?

- A. When an airplane is banked to change direction, some of its vertical component of lift transfers to a horizontal component. As a result, more back elevator pressure is required to keep the airplane at a constant altitude.

134. What is hypoxia? How can it be prevented?

- A. Hypoxia is insufficient oxygen in the blood. It can be prevented by flying at a lower altitude or by using supplemental oxygen.

135. What is hyperventilation? How can it be treated?

- A. Hyperventilation is insufficient carbon dioxide in the blood. It can be treated by taking slow, deep breaths, or by breathing into a bag.

136. How can stress affect your flying?

- A. Stress degrades decision making ability and slows your reactions.

137. What is dehydration? How can it affect you as a pilot?

- A. Dehydration occurs when the body is deprived of fluids. Dehydration can occur on flights of long duration in which the pilot fails to drink adequate amounts of water, or can be a pre-existing condition prior to the flight. Dehydration acts as a stressor, and can degrade your decision-making ability.

138. What is a good rule for flying if taking medication?

- A. Do NOT fly if you are taking medication unless the medication is approved by the FAA or you are certain that the medicine will NOT impair your abilities.

139. What is carbon monoxide poisoning? What is the primary source of it in aircraft cockpits?

- A. Carbon monoxide poisoning occurs when carbon monoxide enters the blood, thereby causing hypoxia. The most common source of carbon monoxide in aircraft cockpits is exhaust fumes from a defective heater or other source.

140. How long should pilots and passengers wait to fly after SCUBA diving?

- A. If a controlled ascent was required during the dive, wait 24 hours before flying. If a controlled ascent was not required, wait 12 hours before flying up to 8,000 ft. and 24 hours for any altitude above 8,000 ft.

141. What is the graveyard spiral?

- A. If descending during a coordinated constant-rate turn that has ceased stimulating, the motion-sensing system can create the illusion of being in a descent with the wings level. A disoriented pilot will pull back on the controls, tightening the spiral and increasing the loss of altitude.

142. How can you recover from spatial disorientation?

- A. The best way to recover from spatial disorientation is to focus on the flight instruments and rely on their indications.

143. How long does it take your eyes to fully adapt to darkness?

- A. It takes your eyes 30 minutes to fully adapt to darkness. If you accidentally view a bright light, your night vision will be lost instantly.

144. What is the recommended altitude to begin using oxygen at night to reduce the risk of hypoxia and impaired vision?

- A. It is recommended that supplemental oxygen be used above 5,000 ft. at night to avoid the risk of hypoxia and impaired vision.

145. How should one scan for traffic at night?

- A. Scanning for traffic at night should be done with peripheral vision. This is because the rods are concentrated outside of the fovea.

146. What are some common illusions during night flight?

- A. A few common illusions encountered during night flight are: false horizon, an obscured horizon or a dark scene spread with ground lights and stars that can create illusions of not being aligned correctly with the actual horizon; autokinesis, where a static light will appear to move about when stared at for several seconds in the dark; and ground lighting illusion, where lights along a straight path, such as a road, can be mistaken for runway and approach lights.

147. What portion of the eye is used for night vision?

- A. Rods are used for night vision.

148. What color is a civilian land airport beacon?

- A. Civilian land airport beacons are alternating white and green flashes. A military airport beacon flashes two whites and a green.

149. What should you do if you experience vertigo at night?

- A. If you experience vertigo at night, you must trust your instruments and rely on their indications. To help prevent vertigo, turn off the strobe lights if you are in reduced visibility.

150. Which light gun signal indicates that you are cleared to land? Which light gun signal indicates that you are cleared for takeoff?

- A. The light gun signal indicating that you are cleared to land is steady green. The signal for cleared for takeoff is also steady green.

151. What does a steady red light gun signal indicate on the ground? In the air?

- A. A steady red light gun signal on the ground means to stop. In the air, steady red means to give way to other aircraft, and continue circling.

152. What is the procedure if you have lost communication with the tower at a tower controlled field?

- A. If you have lost your ability to communicate with the control tower, you should observe the flow of traffic, enter the pattern, and look for light gun signals. When you receive a signal, acknowledge it by rocking your wings. Additionally, your transponder should be set to 7600.

153. After landing without a radio at a controlled field, must you stop and wait after clearing the runway for another light gun signal?

- A. Yes. After landing without a radio at a towered controlled airport, you are required to stop after clearing the runway and wait for another light gun signal before you are allowed to taxi. The signal clearing you to taxi will be a flashing green light.

154. Why would an airport rotating beacon be operating during daylight hours?

- A. If an airport's rotating beacon is on during daylight hours, it usually indicates that the prevailing weather is below basic VFR minimums, i.e., visibility of less than 3 SM, and/or a ceiling of less than 1000 ft.

155. What is a displaced threshold? How is it indicated?

- A. A displaced threshold can only be used for taxi, takeoff, and the landing rollout. Displaced thresholds are indicated by white arrows that point to the runway threshold, which is a thick white line perpendicular across the runway.

156. What are hold short lines? How are they indicated?

- A. Hold short lines indicate the active runway environment. If you are at a tower controlled field, you cannot cross hold short lines until you are cleared to do so. At a nontowered field, you should visually scan the area for traffic, then announce your intentions before crossing hold short lines. Hold short lines are depicted by 4 yellow lines, 2 broken and 2 solid. The two solid lines are always on the side where the aircraft is to hold.

157. What color are mandatory instruction signs? What color are taxiway location signs? What color are direction signs?

- A. Mandatory instruction signs are white letters on a red background. Taxiway location signs are yellow letters on a black background. Direction signs are black letters on a yellow background.

158. What color are taxiway markings and lighting? What color are runway markings and lighting?

- A. Taxiway markings consist of a yellow centerline and yellow shoulder markings. If lights are installed on the taxiway centerline, they will be steady green. Taxiway edge lights are steady blue. Runway markings consist of a white centerline and white shoulder markings. Runway centerline lights are all white. The last 3000 ft. section of runway is identified by alternating red and white centerline lights. The final 1000 ft. section of runway has only red centerline lights. Runway edge lighting is white, except on instrument approach runways. Yellow edge lighting replaces white on the last 2000 ft. section of runway to form a caution zone for landing.

159. What is a non-movement area?

- A. A non-movement area is a designated area where aircraft can taxi without being in contact with the tower. For example, the ramp at an FBO is often a non-movement area.

160. What is the first step when diverting to a new destination?

- A. The first step to take when diverting to a new destination is to turn to the approximate heading of the new destination. This will allow you to be flying towards the destination while you are figuring out the exact heading and distance. Moreover, in the event that the diversion is due to an emergency, it is vital to divert to the new course as soon as possible.

161. What are the important calculations needed for a safe, successful diversion?

- A. After turning toward the new destination, calculate the exact heading and distance to the alternate airfield. Then calculate groundspeed, arrival time, and fuel needed to get there.

162. What steps should you take to determine your position if you suspect you are lost?

- A. First, if conditions permit, initiate a climb. Climbing will allow you to see farther so that you may identify a prominent landmark. If you cannot verify your position visually, you can triangulate using VORs, ask ATC for help, or utilize GPS if it is available.

163. How do you use VORs to triangulate your position?

- A. First, tune-in and identify a nearby VOR station (you may need to climb to pick-up the signal). Center the CDI with a from indication. Draw a line on the chart indicating the radial you are on. Repeat this process for another neighboring VOR. The point where the lines intersect is your position.

164. What makes the preflight at night different from the preflight during the day?

- A. The night preflight is difficult to perform because you cannot see as well at night. In addition to the normal checks and inspections, your night preflight should include a check of all lights and lighting systems.

165. What additional equipment should you bring with you on a night flight?

- A. It is a good idea to bring two flashlights and spare batteries with you on a night flight.

166. How much fuel reserve is required for VFR night flight?

- A. The FARs require a VFR fuel reserve of 45 minutes at night. More is better.

167. What color are runway lights?

- A. Runway lights are primarily white, though some turn red to indicate a lessening amount of runway remaining.

168. What is a spin?

- A. A spin is an aggravated stall that results in autorotation.

169. In which situations is a spin likely to occur?

- A. Spins can occur in almost any situation. However, the most common situations where spins happen are in the pattern on the turn from base to final and during a go-around.

170. What is the difference between a steep spiral and a spin?

- A. By definition, an airplane must be stalled to be in a spin but not so in a steep spiral.

171. What is the recommended spin recovery for your airplane?

- A. Though every airplane has a slightly different spin recovery procedure, it is usually throttle to idle, neutralize the ailerons, full rudder deflection in the opposite direction of the turn, break the stall with forward elevator pressure, level the wings if necessary, and recover from the descent.

172. What is the procedure if you have an engine failure in flight?

- A. As soon as you realize an engine failure has occurred, immediately establish the best glide speed for your airplane and trim to hold this speed. Select an emergency landing site. Then, time permitting, go through the appropriate forced landing checklist.

173. What would happen if the vacuum pump failed in your airplane? Is it considered an emergency situation in VFR conditions?

- A. A failed vacuum pump will result in the loss of the attitude indicator and the heading indicator. A vacuum pump failure often goes unnoticed by pilots because the gyros take a long time to wind down. This is not considered an emergency situation in VFR conditions because these instruments are not necessary for safe flight.

174. What would happen to the altimeter if the pitot-static system were obstructed? What would happen to the VSI? What would happen to the airspeed indicator?

- A. If the pitot-static system was blocked, the altimeter would indicate the altitude where the system became blocked. The VSI would give no indication in a climb or descent. The airspeed indicator would read zero.

175. What error does the altimeter indicate if you are using an alternate static source?

- A. Because alternate static sources are usually located inside the cockpit where the pressure is lower than it is outside the airplane, the altimeter indicates higher than normal.

176. What does a low voltage light indicate when it is illuminated? How would you address this situation?

- A. A low voltage light indicates that the alternator or generator is not working and the electrical equipment is running from the battery. To effectively deal with the situation, turn off all non-essential electrical equipment and land as soon as practical.

177. What is the procedure if a circuit breaker pops?

- A. If a circuit breaker pops and it is resettable, push it back in once. If it pops out again, leave it out and determine the next course of action. Pushing the breaker in more than once may lead to an electrical fire.

178. What are some common causes of a rough running engine in flight?

- A. Though there are numerous factors that can cause an engine to run rough, the most common causes are carburetor ice, a problematic magneto, or fouled spark plugs.

179. What is the necessary action if you lose a magneto in flight?

- A. If a magneto is lost in flight, determine the bad magneto by switching from both to either left or right. The bad magneto will be evident when the engine will not run on that particular magneto. After you identify the bad magneto, run on the good one and land as soon as practical.

180. Is using all the fuel from one tank before switching to another a good practice? Why?

- A. Using all the fuel from one tank is not a good practice because it may cause vapor lock in the fuel line. The result may be an engine failure without the ability to restart it in flight.

181. What should you do if you notice that you are losing oil pressure?

- A. A loss of oil pressure should be viewed as an emergency situation. The engine will not continue to run with low oil pressure. Be prepared for a forced landing. Attempt to fly to the nearest airport.

182. What are the required inspections for an ELT?

- A. An ELT must have been inspected in the preceding 12 calendar months to be legal. Also, the ELT battery must be replaced after 1 hour of cumulative use or after 50% of its useful life.

183. Must your airplane be equipped with a working ELT before beginning a flight?

- A. Yes. ELTs are always required unless exempt under FAR Part 91.207. An example of where an aircraft is not required to have an ELT is if that aircraft is used for flight instruction within 50 NM of the home airport.

184. How is an ELT activated?

- A. An ELT can be activated either manually by flipping the switch on the physical unit, or automatically by an impact to the airplane.

185. What signal does an ELT emit?

- A. ELTs emit a distress signal on 121.5.

186. What other survival gear is your airplane equipped with?

- A. Some small airplanes are equipped with a fire extinguisher and/or life vests. Know what your airplane is equipped with and be able to describe its location and explain how to use it.

187. Are you required to have flotation devices for all occupants when flying over water?

- A. Only flights that are operated for hire beyond power-off gliding distance from shore are required to have flotation devices for all occupants when flying over open water.

9.2 SPORT PILOT**1. What medical requirements must a person meet to legally operate as a sport pilot?**

- A. A person must hold at least a third class medical certificate, or a current and valid U.S. driver's license. A person using a driver's license to meet the requirements must comply with any restriction or limitation imposed on the license, have been found eligible for at least a third class medical certificate at the time of their last application (or have never applied for a medical), not have had their most recent medical certificate suspended, revoked, or withdrawn (if they have held a medical), and not know of any medical condition that would make them unable to operate a light-sport aircraft in a safe manner.

2. Can a sport pilot carry passengers? If so, is there a limit?

- A. Yes, a sport pilot is allowed to carry only one passenger.

3. What is the maximum takeoff weight allowed for a light-sport aircraft not intended for water operations?

- A. A light-sport aircraft not intended for water operations may have a maximum takeoff weight of 1,320 lb., or 600 kilograms.

4. **What is the definition of a light-sport aircraft (airplane)?**
- A. Light-sport aircraft means an aircraft that, since its original certification, has continued to meet the following:
1. A maximum takeoff weight of not more than 1,320 lb. (600 kg) for aircraft not intended for operation on water.
 2. A maximum airspeed in level flight with maximum continuous power (VH) of not more than 120 kt. CAS under standard atmospheric conditions at sea level.
 3. A maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (VS1) of not more than 45 kt. CAS at the aircraft's maximum certificated takeoff weight and most critical center of gravity.
 4. A maximum seating capacity of no more than two persons, including the pilot.
 5. A single, reciprocating engine, if powered.
 6. A fixed or ground-adjustable propeller if a powered aircraft other than a powered glider.
 7. A nonpressurized cabin, if equipped with a cabin.
 8. Fixed landing gear, except for an aircraft intended for operation on water or a glider.
5. **Can a certificated sport pilot who holds no other valid pilot certificates operate an aircraft not intended for water operations and weighs more than 1,320 lb. (600 kg), e.g. a Cessna 150?**
- A. No. A sport pilot can only operate a light-sport aircraft. One of the requirements of a light-sport aircraft is that it has a maximum takeoff weight of not more than 1,320 lb. (600 kg) for aircraft not intended for operation on water.
6. **Can a sport pilot operate at night?**
- A. No. Sport pilots are prohibited from operating at night.
7. **What is the definition of night?**
- A. Night means the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.
8. **Can a sport pilot fly in VFR conditions over the top of a cloud ceiling?**
- A. No. A sport pilot cannot act as PIC of a light-sport aircraft without visual reference to the surface.
9. **What are the requirements for a sport pilot to operate in Class B, C, and D airspace?**
- A. A sport pilot must receive and log ground and flight training related to the operation of an aircraft in Class B, C, or D airspace from an authorized instructor who additionally provides a logbook endorsement that certifies that one is proficient in the aeronautical areas and areas of operation listed in 14 CFR 61.325.
10. **What are the requirements for a sport pilot to operate in a light-sport aircraft that has a VH of greater than 87 kt. CAS?**
- A. A sport pilot must receive and log ground and flight training from an authorized instructor in an aircraft that has a VH greater than 87 kt. CAS, and receive a logbook endorsement from the instructor providing the flight training certifying that you are proficient in an aircraft with a VH of greater than 87 kt.

9.3 COMMERCIAL PILOT

1. **What minimum class of medical certificate is required to act as PIC on a commercial flight conducted under Part 91 or Part 135? What about under Part 121?**
 - A. To act as PIC on a commercial flight conducted under Parts 91 and 135, you are required to have a second-class medical certificate. To act as PIC under Part 121, you are required to have a first-class medical certificate.
2. **Above what altitude must all passengers be provided with supplemental oxygen?**
 - A. All passengers must be provided with supplemental oxygen when the cabin altitude is above 15,000 ft. MSL. The required flight crew must be provided with and use supplemental oxygen for all time in excess of 30 minutes spent above 12,500 ft. MSL and for the entire time spent above 14,000 ft. MSL.
3. **What is common carriage?**
 - A. Common carriage is considered a willingness to fly anyone or anything for hire. With common carriage, customers usually come as a result of advertising or through an intermediary.
4. **What is holding out?**
 - A. Holding out is advertising or working with an intermediary to gain customers in order to fly for hire. A business that is holding out is usually practicing common carriage.
5. **Are you authorized to hold out as a Part 91 commercial operator?**
 - A. No. By definition, holding out requires an air carrier certificate. Part 119 regulates the certification of air carriers and commercial operators.
6. **When making power adjustments with a constant-speed propeller, what should be changed first?**
 - A. When making a power adjustment with a constant-speed propeller, it is important to keep the manifold pressure setting below the RPM setting. When decreasing power, always reduce manifold pressure before reducing RPM. When increasing power, always increase RPM before increasing manifold pressure.
7. **What does the throttle control on an engine with a constant-speed prop? What does the propeller control operate?**
 - A. The throttle controls manifold pressure, and the propeller control operates RPM with a constant-speed propeller.