EVERYTHING YOU NEED TO KNOW
FOR INSTRUMENT ORAL

1. **AGL** - Above Ground Level. This is the altitude of an object or aircraft with relation to the surface elevation. The figures are provided in ( ) when found on charts near towers. The only 2 AGL altitudes found on approach plates are HAT and HAA. Both tell the pilot how high they actually are above the landing area.

ALS - Airport Lighting System.

ASR - Airport Surveillance Radar. Allows ATC to guide an airplane that has lost vacuum instruments and is coming in with no gyros. The controllers will advise the craft when to start and stop turns. All turns are to be made at standard rate until the controller advises the craft it is inside the outer marker, at which time the turns will become half-standard rate. No altitude information is provided by ATC.

ATC - Air Traffic Control. The FAA devised branch that controls the flow of air traffic and assists pilots. They have the power to provide clearance to, from, and through airspace BUT may be overruled by the pilot if the pilot feels the operation is not safe, if he is unable to perform the clearance, or if he feels the clearance is prohibited by the FAR's.

CAS - Calibrated Airspeed. The airspeed that is determined after considering the errors caused by and/or during installation.

DH- Decision Height. Found on ILS approach plates. It is the altitude at which the pilot makes a go/no-go decision regarding landing after the approach. The decision height is the missed approach point on an ILS approach. The pilot will reach this altitude at only one point and time. The glide slope is designed to guide the pilot to the decision height. If, upon reaching decision height, the pilot does not have the airport environment in sight, he must execute the missed approach procedure.

DME - Distance Measuring Equipment. It is collocated with VORTACs and sends radio waves to determine how far away the aircraft is from the station. DME is most accurate a mile or more from the station and least accurate directly overhead the station.

FAA - Federal Aviation Administration. The governing body of aviation in the U.S. Determines regulations, investigates incidents/accidents, levies fines, hears cases, issues licenses and ratings.

GS - Groundspeed. Refers to the actual speed of any aircraft with relation to the surface.

HIRL - High Intensity Runway Lights. A type of runway lighting.

IAS- Indicated Airspeed. This is the speed read directly off the Airspeed indicator with no adjustments made.

ICAO - International Civil Aeronautics Organization. Works in conjunction with the FAA and its international counterparts to unify aviation regarding airspace, usage, and regulations.

IFR - Instrument Flight Rules. Those regulations which pertain to flights when the pilot is referencing only instruments. IMC, Instrument Meteorological Conditions are those which are below the minimums for VFR flight.

ILS - Instrument Landing System. A precision approach which provides assistance along the horizontal and vertical paths by means of the localizer and the glide slope.

IM - Inner Marker. The marker closest to the runway on an ILS approach. This marker is normally crossed at or near decision height.

INT- Intersection. An intersection is the point at which two navigational aids are used to determine a specific point. The majority of intersections are identified by crossing VOR radials.

LDA - Localizer Type Directional Aid. This is a non-precision approach similar to the localizer. The LDA transmitter is off center of the runway making the approach and approach to landing less accurate than a localizer approach.

LIFR - Low Instrument Flight Rules. A misleading abbreviation. LIMC would be more accurate. LIFR refers to minimal flight conditions. Weather that is classified as IFR but which is not recommended flying in under any circumstances. LIFR pertains to ceilings and visibilities lower than approach minimums.

LMM - Locator Middle Marker. A locator compass (NDB type facility) collocated with the middle marker.

MAA - Maximum Authorized Altitude. Found on the low enroute chart. Signifies the highest altitude allowable for IFR flight. Generally used to keep aircraft from receiving more than one VOR on a frequency.

MCA- Minimum Crossing Altitude. This is found on the enroute charts and is denoted by a flag with an X in the middle. It is used to tell the pilot that a new altitude will be used on the other side of the fix and that it is necessary to be at least as high as the MCA before reaching the fix. The purpose may be for obstacles, obstructions, or navigational coverage.

MDA - Minimum Descent Altitude. The lowest altitude an aircraft may descend on a non-precision approach without having the airport environment in sight.

MEA - Minimum Enroute Altitude. The lowest altitude an IFR flight may be assigned or may request and be assured radio/navigation reception and terrain clearance.

MM - Middle Marker. The midpoint between the outer marker and the inner marker on an ILS approach.

MOCA - Minimum Obstacle Clearance Altitude. An emergency altitude found on low enroute charts. Signifies that obstacle clearance is provided in cases of emergency. No reception is guaranteed.

MRA- Minimum Reception Altitude. Also found on the enroute charts and denoted by a flag with an R in the middle. Used to inform the pilot that an altitude below the MRA will be insufficient to receive navigational and/or communications radio signals.

MSL - Mean Sea Level. An altitude or elevation given relative to mean sea level. This is the altitude the pilot reads from the altimeter and the altitude/elevation that is used for most items on charts and plates.

MSA - Minimum Safe Altitude. The lowest altitude that an aircraft may fly and be clear of obstacles/obstructions. This term is used in reference to regulated clearances

and found on approach plates specifying the MSA within 25 miles of the center of the approach.

NDB - Non-directional Beacon. The ground facility which transmits signals to the ADF (automatic direction finder) in the airplane.

ADF - Automatic Direction Finder. The navigational equipment in the airplane that receives radio signals from the NDB.

NOPT- No Procedure Turn. Found on approach plates. Informs the pilot that a procedure turn is either unnecessary or unauthorized. Other times when a procedure turn is not required include: **S**traight in approaches, **H**old in lieu of, **A**rc to the approach, **R**adar Vectors to the approach, and **p**ublished notice that a procedure turn is not necessary/authorized (SHARP).

OM - Outer Marker. The beginning point of the final approach segment on an approach. Denoted by a Maltese cross. Also the point at which the descent begins. May be collocated with an NDB or Compass Locator and called an LOM.

PAR - Precision Approach Radar. Similar to an ILS, but is verbally provided by an air traffic control facility.

RBN - Radio Beacon. An abbreviation used on navigational charts.

REIL - Runway End Identifier Lights.

RVR- Runway Visual Range. Determined by using instruments on the runway to gauge the amount of visibility. It is reported in feet and the minimum RVR necessary for an approach is found on the approach plate.

RVV- Runway Visual Value. Similar to RVR but is determined by human eyes rather than electronic ones.

TAS - True Airspeed. The airspeed of an aircraft relative to undisturbed air.

TDZE - Touchdown Zone Elevation. The highest elevation in the touchdown zone - first 3,000' of the landing runway.

TDZL - Touchdown Zone Lights. Colored lighting to signify to the pilot how much of the touchdown zone remains.

TVOR - Terminal Very High Omnirange. A type of VOR with limited capacity. Is not capable of providing enroute navigation. Has a range of 25 miles. Most often used near another VOR facility or for approach purposes only.

VFR - Visual Flight Rules. Those regulations that pertain to pilots and aircraft that are flying in VMC (Visual Meteorological Conditions).

MVFR - Marginal Visual Flight Rules. Misused term referring to MVMC. When conditions meet but do not exceed the minimums for VFR flight.

VHF - Very High Frequency. The frequency over which most communication and navigation equipment and transmissions occur on.

VOR - Very High Omni Range. A navigational facility that transmits on VHF and uses radials which tell where the pilot is "from" the facility.

2. The pitot-static system and altimeter are required to be checked every 24 calendar months.

3. The minimum equipment requirements for IFR flight are:
airspeed indicator altimeter
magnetic direction indicator engine tachometer
engine oil pressure gauge fuel gauge (quantity)
safety belt emergency locator transmitter (ELT)
position lights (night) anti-collision lights (night) landing light (night/hire) spare fuses (night)
gyroscopic rate of turn slip/skid indicator
2-way communications/navigation equipment for ground facility to be used
altimeter adjustable to barometric pressure
clock w/ hours, minutes, seconds (sweep hand or digital)
generator/alternator of adequate capacity
gyroscopic pitch and bank indicator (artificial horizon)
gyroscopic direction indicator (directional gyro or equivalent)

4. Class A airspace begins at 18,000 (FL 180). A mode C transponder and two-way radio communication capabilities are required. The plane must be IFR certified and current as must the pilot. The aircraft must be listed on an IFR flight plan.

5. The MSA for IFR flights in mountainous regions and in non-mountainous regions are the same as any other MSA. The aircraft must remain at or above MEA/MOCA and is responsible for any non-airway terrain clearance. It is, however, generally accepted that 2,000' is the MSA in mountainous terrain and 1,000' is the MSA in non-mountainous terrain.

6. The two AGL altitudes listed on the instrument approach plates (IAP) are HAA and HAT. HAA refers to the height of the aircraft above the airport upon reaching MDA on a circling approach. HAT is the height above touchdown and is denoted on approaches that are straight in. The HAT is determined by subtracting the TDZE (touchdown zone elevation) from the DH or MDA of a straight-in approach. The TDZE is found by determining the highest point in the "touchdown zone" which is the first 3,000' of the landing runway.

7. The value of each dot on the VOR face, when referring to ILS approaches, is negligible, with full scale deflection being only 2.5* off course.

8. A missed approach must be executed if the glideslope (or localizer) has full scale deflection or two dots at the middle marker.

9. A bearing is the opposite of a radial and goes to the station. Your bearing is determined by where you are on the azimuth. A course is what you are actually tracking. Most times, if you are attempting to hold on a particular bearing to the station, your course should be the same.

10. You may proceed to your alternate regardless of the weather. However, the recommended course of action is to find another alternate that has acceptable weather conditions.

11. If you lose communications radios, squawk 7600.

12. TAS is the airspeed of the aircraft relative to undisturbed air and is equivalent airspeed (CAS corrected for adiabatic compressible flow for a particular altitude) corrected for air-density variation from the standard value at sea level. TAS increases with altitude when IAS remains the same. TAS may be calculated on the E6B.

13. An alternate is needed if: from an hour before your estimated arrival to an hour after your estimated arrival the weather at the destination airport is forecast to be below 2,000 foot ceilings and/or 3 miles visibility.

14. If your intended alternate has a precision approach then minimums are 600 foot ceilings and 2 miles visibility. If the intended alternate has only non-precision approaches then the alternate minimums are 800 foot ceilings and 2 mile visibility. Remember to check the intended alternate for non-standard and/or not authorized alternate minimums.

15. An **FA** is an *Area Forecast*. It contains information regarding several states (region) including information about icing, turbulence, sigmets, airmets, convective weather, flight precautions and a general forecast for each segment of the state in the region. They are good for a 24 hour period and are issued 3 times a day (8 hour intervals).

An **FT** is a *Terminal Forecast*. It is issued by the tower at large airports and contains the forecast cloud conditions including any possibility of rain or other flight hazards. Visibility is forecast if it is expected to be below 6 miles. Wind is forecast if it is expected to be in excess of 6 knots. It is issued every 8 hours and is valid for 24 hours. The last 6 hours of the forecast is called an outlook and will describe the type of weather anticipated, i.e. VFR, MVFR, IFR. If the outlook is less than VFR a reason will be given.

An **SA** is a *Surface Aviation* report. It includes the location, time, cloud cover, visibility, any cause for the restriction, i.e. rain, snow, haze, fog, millibars, temperature, dewpoint, wind, mercury, and remarks. It is issued every hour just prior to the hour. It is valid for one hour.

An **SP** is a *Special* report. It is the same as an SA but is issued only when there has been significant change in the previous hours reported weather conditions. SPs are issued at times other than normal and are valid until the next surface observation.

An **RS** is a *Record Special*. It is the combination of an SA and an SP. An RS signifies change in the weather but is reported when a surface observation would normally be recorded and is valid until the next surface observation.

A **PIREP** is a *Pilot Report*. It includes information pertaining to in-flight weather conditions and includes the location, type aircraft, time, and weather conditions usually including, but not limited to, visibility, turbulence, icing, and cloud layers. PIREPs are valid for one hour.

16. AIRMETs are published as advisories to light aircraft, they are generally considered the least threatening of the three advisories listed here, and include hazard warnings regarding the following types of weather phenomena:

moderate icing, moderate turbulence, sustained winds of 30 knots or more on the surface, widespread areas below 1,000' and 3 miles visibility, and extensive mountain obscurement.

SIGMETS are published as advisories to all aircraft, and though they include weather of a greater magnitude than AIRMETs are not considered as dangerous as Convective Sigmets, they include hazard warnings regarding the following types of weather phenomena:

severe icing, severe and extreme turbulence, duststorms and/or sandstorms and/or volcanic ash lowering visibilities below 3 miles.

CONVECTIVE SIGMETS are published as advisories to all aircraft, are considered the most threatening, dangerous, and deadly weather advisories published, they include hazard warnings regarding the following types of weather phenomena:

include all hazards included in a SIGMET and tornadoes, lines of thunderstorms, thunderstorms over a wide area, and hail greater than or equal to 3/4" in diameter.
Issued for (E)astern, (C)entral, and (W)estern U.S. Individual convective SIGMETS are numbered sequentially for each area (01-99) daily.
FSS broadcasts AIRMETs, and SIGMETs upon receipt and at 30 minute intervals (at H+15 and H+45) for the first hour after issuance. And broadcasts Convective SIGMETs upon receipt and at 15 minute intervals for the first hour after issuance.

17. For each of the following types of charts....describe what they are, how they are used by pilots, how often they are issued, observed, or forecast, and what their period of forecast/validity is:

Surface Analysis	***Weather Depiction***
Radar Summary	***Significant Weather Prognostic***
Composite Moisture Stability	***Sever Weather Outlook***
Constant Pressure	

18. Thunderstorms proceed through several stages: cumulus, mature, dissipating. The cumulus stage of the thunderstorm is the beginning stage and is characterized by updrafts, heightening clouds, and thermal-type turbulence. The mature stage is the actual "active" stage of the thunderstorm and is

characterized by updrafts, downdrafts, turbulence, precipitation, and lightning. This is the most dangerous stage of the thunderstorm and should be avoided. The final stage, dissipating, is obvious from downdrafts and continuous rainfall as the storm clouds rain themselves out.
Thunderstorms have the following hazards associated with them: lightning, heavy rainfall, hail, wind, windshear, and turbulence.

19. Stratus are associated with stable air masses and are evident by continuous precipitation, broken to overcast skies, little to no turbulence, poor visibility, and low ceilings. Cumulus are just the opposite, associated with unstable air, showery precipitation, scattered to broken skies, moderate to severe turbulence, good visibility, and moderate to high ceilings.

20. ISA at sea level was developed as a measuring point or a norm by which to measure the changes/differences anywhere at anytime. ISA is measured at sea level and is denoted by 29.92"Hg, 1013.2mb, 15*C, and 59*F with a standard lapse rate per thousand feet of 1" Hg, 2*C, and 3.2*F.

21. Low Enroute Charts are published every 56 days.
Approach plates are published every 56 days.
Sectionals are published every 6 months.
Airport/Facilities Directories are published every 56 days.

22. Charts can never be completely current (unless you have an in with the DOT and the planning/zoning commission for every state). In order to have an acceptably current chart you should 1) purchase the newest available, 2) purchase the newest available A/F D, 3) update the new sectional with the data available in the back of the A/F D, and 4) call FSS to get the most recent changes (or use DUAT which is recommended because of the number of changes to be made).

23. See #162.

24. Low enroute charts use a color coding system for the airports. A blue airport has a civil approach and an approved DOD approach. A green airport has an approach. And a brown airport has no IFR approach at all.

25. The triangles on a low enroute chart denote intersections. Hollow or non-filled triangles are not only intersections but are also non-compulsory reporting points. Pure or filled triangles are intersections and compulsory reporting points.

26. Low enroute charts provide a number of signs and symbols informing the pilot whether or not DME may be used in identifying an intersection. Two of those symbols are: a capital D with the number inside it and an arrow on top of it or an arrow

with an open arrowhead and a number below it.

27. Terrain and obstacle clearance for off-airway flights should be determined by using a sectional and planning the off-airway portion of the flight just as you would for a VFR flight using the quadrant numbers as a guideline for clearance.

28. FAF represents the Final Approach Fix and FAP denotes the Final Approach Point. A fix is an identifiable place in the time/space continuum it exists at only one point and is identifiable by various means. A point, on the other hand, may occur at a number of places and is dependent solely on conditions being met. The FAF is generally where the Maltese cross is found and is identifiable by various methods. The FAF is used with any and all non-precision approaches. The FAP is the point at which the aircraft transcends the final approach glide path designated by the glideslope and it may occur at any time those conditions are met.

29. The FAF on both the precision and the non-precision approach is found at the outer marker (OM) and is designated by the Maltese cross.

30. HAA is the height above airport and is found on the approach plate with the listing for circling approach minimums. It is found by measuring the highest possible landing point on the airport premises. HAT is the height above touchdown and is found alongside straight-in approach minimums. It is found by measuring the highest point in the landing zone (first 3,000' of runway).

31. The approach categories are endless (as technology allows for faster aircraft the categories will continue to grow) but are generally thought to run from A to E. They are based on approach speed of the aircraft.

32. Circling approaches guarantee the pilot @ 1.3 miles of clearance if Category A and @ 1.5 miles of clearance if Category B.

33. Descent below MDA and/or DH is allowed *only* when the plane is in an emergency situation or when the airport environment has been detected and maintained by the pilot.

34. A precision approach consists of the following ground components:
    localizer radio course
    glide slope radio course
    two VHF marker beacons (outer and middle)
    approach lights

    May also include:

compass locators
distance measuring equipment
supplementary lighting systems

Airborne equipment will usually include the following components:
localizer receiver
glide slope receiver
marker beacon receiver
ADF receiver
DME receiver

35. The runway environment is characterized by:
1- Approach Lighting System
2- Threshold Threshold markings Threshold lights
3- Runway end identifier lights
4- Visual Approach Slope Indicator
5- Touchdown Zone TDZ markings Touchdown Zone Lights
6- Runway Runway markings Runway Lights

If the pilot has only the approach lights in sight, descent to 100 feet above the TDZE is permitted until and unless he has more of the runway environment in sight.

36. An approach with a number, such as VOR 13, designates an approach to a specific runway and implies that the approach is within 30* of the runway centerline. An approach with a letter, such as VOR-A, designates an approach to the airport but not a specific runway. These approaches are circling approaches and are not within 30* of any one runway.

37. A straight-in approach must be within 30* of the runway centerline.

38. An LDA approach is comparable in utility and accuracy to an ILS but is not aligned with the runway.
An SDF approach may or may not be aligned with the runway and is less precise than an ILS.

39. Timing non-precision approaches is essential. It is important to realize that the timing will be effected by wind. A tailwind will "push" the plane along and will cause you to reach your missed approach point (MAP) prior to the expiration of the time. This will cause the plane to be past the runway when the time expires and a landing will not be feasible. Likewise, a headwind will act to "slow" the plane down and the plane will not yet have reached the MAP when the time expires. Again, the plane will not be in a position to land and a missed approach will be executed.

40. A contact approach must be requested by the pilot and cannot be issued by a

controller without pilot's request. Airport must have an instrument approach, visibility on the ground must be at least one mile, you must be able to remain clear of the clouds with at least one mile flight visibility.

A visual approach may be issued or requested. Controller must verify that you have the field in sight or a preceding aircraft which you are to follow. If you do not have the aircraft to follow in sight the controller may still issue a visual approach and continue to provide traffic separation and advisories.

41. A shuttle is a type of holding pattern used for heavier aircraft and generally at higher altitudes. A shuttle is executed in the same manner as a normal hold but the legs are two minutes rather than the traditional one minute.

42. required instruments and equipment.....see question 3

43. Mode C is required above 18,000' when in Class A airspace. It is also required in Class B and within 30 miles of Class B and in Class C airspace and beneath Class C.

44. When an aircraft experiences communications failure the pilot should squawk 7600 (unless the pilot believes the situation to constitute an emergency, in which case he should squawk 7700 for 1 minute then 7600 for 15 minutes and repeat).

The appropriate route should be whichever of the following the pilot is capable of flying....the order given is the order in which ATC wishes the pilot to attempt to execute:

1- Route assigned by ATC in last clearance

2- If being radar vectored, the direct route from the point of failure to the fix, route or airway specified in the vectoring clearance

3- In absence of an assigned route, the route ATC advised you to expect in a future clearance

4- In the absence of an assigned or expected route, the route filed in your flight plan

The appropriate altitude should be whichever of the following is highest:

1- last assigned altitude

2- minimum altitude for IFR flight operations (MEA)

3- altitude advised to expect

Leave Clearance Limit refers to when and where you will descend for landing after having lost communications. Follow these guidelines:

1- ATC gave you a fix in your clearance....Continue to that fix and hold until your EFC has expired then continue as follows

2- ATC gave no EFC in your clearance....Hold until your ETA expires, then continue to the airport as follows

3- If no approach was included in your clearance or in an expected clearance, pilot's choice dictates the approach to use (obviously an ILS is the preferred approach in this situation). Proceed to the IAF and hold until your ETA has expired then

begin your approach descending only once established on the approach.

45. The FARs prescribe reports under the following circumstances when on an IFR flight:

Change of altitude
Unable to climb/descend at 500 fpm
Missed Approach
Change in TAS of 5% or 10 knots
Altitude and time entering a hold (crossing the holding fix)
Leaving a fix or hold
Communications/Navigation loss
FAF inbound
Change of ETA if more than 3 minutes
Weather

46. VORs fall under the following categories with the limitations listed:

Standard <u>High</u> Altitude Service Volume -

In a **40** nm radius from **1,000'** to **14,500'**

100 nm	14,500' to 18,000'
130 nm	18,000' to 45,000'
100 nm	45,000' to 60,000'

Standard <u>Low</u> Altitude Service Volume -

In a **40** nm radius from **1,000'** to **18,000'**

Standard <u>Terminal</u> Service Volume -

In a **25** nm radius from **1,000'** to **12,000'**

47. The NDB has the following errors associated with it:

twilight - caused by refraction off the ionosphere at sunset and sunrise and result in needle fluctuations
terrain - mountains and other large obscurements may reflect the L/MF waves and result in false courses or indefinite indications
shoreline - like terrain effect, may reflect waves
precipitation/thunderstorms - cause the ADF needle to "point" to the storm because of the severe magnetism created in the air

48. VORs may be tested in a variety of ways with varying tolerances for each possible test:

1- VOT or Approved Radio Repair Station Test Signal
+/- 4*
2- Designated VOR System Checkpoint on Airport Surface
+/- 4*
3- Designated Airborne VOR Checkpoint
+/- 6*
4- Pilot created airborne checkpoint

+/- 6*

5- Dual VORs, Both Tuned to the Same VOR
4* Differential (not more than 4* difference between the two)

49. The radios are all VHF with the exception of the transponder transmitter and the glideslope antenna which are UHF.

50. The magnetic compass, though a strong basic instrument, has various problems and errors such as:

1- Variation - the angular distance between true and magnetic north displayed on navigation charts

2- Deviation - result of magnetic and electronic interference from other aircraft equipment
corrected by using the compass card

3- Magnetic Dip -
ANDS (Accelerate North, Decelerate South) - when the plane accelerates the magnetic compass will show a turn to the North, to the South when decelerating
Turning Errors are most apparent the further away from the equator and closer to the poles. Turn from a northerly heading will result in the magnetic compass initially turning in the opposite direction and lagging behind the turn. The opposite is true when turning from a southerly heading. Therefore, lead the roll-out for turns to the north and lag it for turns to the south. UNOS (Undershoot North, Overshoot South). The amount by which to lead/lag the roll-out can be determined by adding 1/2 the bank angle to the latitude at which you are flying and subtracting the sum from the heading on which you wish to roll-out (if flying to a northerly heading and adding the sum for southerly headings). Remembering that there is no turning error on easterly and westerly headings and that the amount by which to roll-out on headings between east and south or east and north or west and south or west and north will be some percentage of the figures derived for rolling out on N or S.

51. If flying over Middle Georgia, you should begin your roll out prior to North by approximately 40* derived by adding 1/2 the bank angle (15*/2 = @7) to the latitude (@ 33*) .

52. De-icing equipment is used to remove ice that has already formed on the aircraft surfaces. Anti-icing equipment is used to prevent the onset of structural icing. Most general aviation planes are equipped with anti-icing on the pitot tube through the use of pitot heat and de-icing in the carburetor with carburetor heat. De-icing is used by

heating an otherwise cold area to the point that the ice melts or is expanded till it breaks apart. Anti-icing heats a surface above freezing so that ice will be unable to form.

53. The altimeter must be within 75' of field elevation when set to the correct barometric pressure. Any more than that would ground the flight as having an inoperative altimeter.

54. After vacuum instruments are lost, the pilot must report failure to ATC.

55. The following documents must be on board the aircraft for IFR flights:
Airworthiness Certificate Registration Radio Station License
Operating Limitations (POH) Weight and Balance Documents

56. d. - actual IMC, simulated IMC, IFR flight plan (assuming that the flight is also under IMC).

57. 6, 6, 6 - SIX hours of instrument flight/training, SIX approaches, in the last SIX months - no more than 3 hours can be in a ground trainer
3 takeoffs and landings in the last 90 days if carrying passengers
(full stop if at night or in a tailwheel airplane)

58. RVR is runway visual range and is determined with electronic equipment.
RVV is runway visual(visibility) value and is determined with the human eye.

59. Cruise 6,000 means that the pilot may fly at any altitude at or below 6,000 without the permission of ATC, the pilot may leave any altitude at any time without notifying ATC, if the pilot notifies ATC that they are level at an altitude the cruise clearance becomes null and void and permission must be obtained before leaving that altitude, a cruise clearance also clears the pilot for the instrument approach at the destination airport.

60. An approach is comprised of the four/five following segments:
Initial Segment, Intermediate Segment, Final Approach,
(Short Final in preparation for landing), and Missed Approach

61. Procedure Turns are not used when:
Straight In approaches are being used
Holds are used in lieu of a procedure turn
Arcs are used to reach the final approach segment
Radar vectors are given to the pilot
Published instructions state "NOPT" or "No Procedure Turn"

62. When flying IFR from an uncontrolled airport it is necessary to "pick up" your clearance before take-off. This clearance is called a void time clearance and is

issued to pilots through FSS rather than ATC. It may be issued on the telephone or on the radio. Essentially, a void time clearance opens a window for the craft to enter the ATC environment. Generally, a ten minute window is available for the pilot and if unable to make that window ATC and/or FSS must be notified (or Search and Rescue will be notified). It is not necessary to maintain VFR until radar contact is established. The purpose of a void time clearance is to allow a plane the safety of being in an IFR environment from the ground up.

63. 3 miles

64. ATIS reporting no clouds or visibility means either the weather observer is not attending the field or that the sky is clear and visibility is unrestricted. SA and FT not reporting wind or visibility means that the wind is less than 6 knots and the visibility is greater than 7.

65. The VOR COP is at the halfway point on most airways and is not labeled. If, however, the COP is in an unusual place it is labeled with a "stretch Z" across the airway noting the mileage from each of the VORs.

66. ATC can clear you below the MEA enroute. The pilot, however, reserves the right to deny that clearance. The MEA insures obstacle clearance and radio reception. If ATC believes that reception will be maintained below the MEA, for example the plane is being vectored and does not need to receive a distant VOR, then ATC may clear that plane below the MEA. Clearance below MOCA, however, is prohibited unless the craft is landing.

67. IFR currency is dependent on a six month basis. If six months elapse and currency is not maintained the pilot may not act as PIC of a craft in IMC. Currency may be attained through the same six hours and six approaches if they are done with an instructor and are performed within six months of the currency period ending date. After that time elapses the pilot will be required to fly with the FAA or a designee in order to reinstate currency. FIRST 6 months, do it on your own and retain PIC privileges. SECOND 6 months, do it with an instructor, temporarily lose PIC privileges in IMC. AFTER that full year has lapsed the pilot must fly with the FAA or a designee.

68. An appropriate safety pilot is one that has at least a private pilot's license for the aircraft being used.

69. Regulations pertaining to instrument flight time are found in FAR 61 and include that time when the pilot is operating solely by reference to instruments and has no visual by which to fly the aircraft.

70. Pilots must carry their license and medical certificate on all flights.

71. IFR flights require a fuel reserve sufficient to reach the destination, execute an

approach and missed approach, continue to the alternate, execute an approach and missed approach, and continue to hold for 45 minutes at cruise altitude and airspeed.

72. No, alternates are not required unless, from an hour before to an hour after your estimated time of arrival, the weather is forecast to be below a 2,000 foot ceiling and 3 miles visibility. In the case that an alternate is required, alternate minimums for precision approaches are 600 foot ceilings and 2 miles visibility and for non-precision approaches the minimums are 800 foot ceilings and 2 miles visibility.

73. Yes, portable electronic devices may be operated on VFR flights and may be permitted aboard IFR flights if the pilot has determined that they will not interfere with the communications and/or navigation signals. A cellular phone is considered a portable electronic device and follows the same guidelines.

74. VORs must be checked every 30 days for IFR flight, but are not required to be checked for VFR flights.

75. An IFR flight plan may be canceled anytime VFR can be maintained.

76. An IFR flight plan may be closed for you by ATC upon arrival or may be closed/canceled by the pilot with ATC or may be closed through FSS. A VFR flight plan must be closed by the pilot through FSS, though, on occasion, ATC may offer the service of closing a VFR flight plan. It is, however, **always** the pilot's responsibility to insure that the flight plan has been closed.

77. Part 91 requires that aircraft with 2 or less engines have at least one mile visibility. Individual airports may have different requirements and will be noted on the approach plate for that airport.

78. MDA is Minimum Descent Altitude, is associated ONLY with non-precision approaches, and is defined as the lowest altitude to which an aircraft may descend while executing an approach without the airport environment in sight. DH is Decision Height, is associated ONLY with precision approaches, and is defined as the lowest altitude to which an aircraft may descend while executing an approach without the airport environment in sight; if the airport environment is not in sight upon reaching DH a missed approach must be immediately executed. DH is synonymous with MAP (missed approach point) on precision approaches.

79. Airways are @ 8 miles wide, pilots fly in the middle with @ 4 miles of 'safety' on either side of them. When flying VFR changes in altitude should be executed by side-stepping the airway, then climbing/descending, and finally resuming centerline position.

80. IFR cruising altitudes are chosen considering the following elements: MOCA, MEA, MSA, and cruising altitude regulations, weather conditions,

wind/turbulence, fuel efficiency, time/speed/distance to climb relative to length of flight, etc.

VFR cruising altitudes are chosen considering the following elements:

MSA, cruising altitude regulations, weather conditions, wind/turbulence, fuel efficiency, time/speed/distance to climb relative to length of flight, etc.

Cruising altitude regulations become effective at 3,000 feet AGL. This allows 500' of separation between traffic in the same direction and 1,000' of separation from traffic in the opposite direction.

5,500'----------VFR----------EASTBOUND----------
5,000'----------IFR----------EASTBOUND----------
4,500'----------VFR----------WESTBOUND----------
4,000'----------IFR----------WESTBOUND----------

81. The outermarker can be identified by MANY means, the following are a few:
NDB collocated will show passage on the ADF
cross radials, use DME, define an intersection at that point
use RNAV, LORAN, and/or GPS
have ATC inform you of passage

82. The transponder/Mode C must be checked every 24 calendar months.

83. VFR ON TOP in cruise flight means that you are flying in VMC on an IFR flight plan and are above a layer or level of IMC. You must comply with both IFR and VFR flight rules.

84. An alternate static source is not required by the FARs. The VSI, however, may be used as an alternate static source. Selecting an alternate static source forces the instruments to use air from within the cabin and will therefore effect the airspeed by showing a slightly higher airspeed, the altimeter by showing a slightly higher altitude, and the vertical speed, if not broken to provide alternate static source, by showing a momentary climb.

85. A pitot heater is not required by the FARs. If, however, it is used it will only effect the airspeed indicator and only very slightly. Using pitot heat will cause the instrument to misjudge the difference between the pressure (since heated air has less pressure than cooled air) and therefore read erroneously on the indicator.

86. Maintain means no climbs or descents are allowed from the assigned altitude unless clearance is obtained from ATC. Cruise means the pilot may fly at any altitude at or below the cruise altitude, flight at any other altitude does not require a clearance from ATC.

87. Pitot-static system and transponder every 24 calendar months. VOR every 30 days. 100 hour inspection if the plane is for hire. Annual inspection.

88. A SID is a Standard Instrument Departure and is used to separate traffic departing from busy airports. SIDS are published alongside approach plates and provide textual and graphic accounts of the procedure. A STAR is a Standard Terminal ARrival and is also used for traffic separation.

89. Mandatory radio reports from aircraft outside of a radar environment are:
1- designated by solid triangles on low altitude enroute charts
2- same as in question 45.

90. Procedures for total electrical failure are not prescribed by the FARs. The procedure for lost communications is listed, but no guidelines are given to assist a pilot that experiences total electrical failure. This question is left open for the pilot to assess the potential threat of such a situation and determine the best action.

91. a. MRA - Minimum Reception Altitude. Denotes a point at which the MEA will not provide coverage for receiving a distant or obscured transmitter.
b. Intersection - not mandatory reporting point
c. Intersection - mandatory reporting point
d. Change in MEA or MOCA in next section of airway
e. Total mileage from one fix to another
f. MEA is the top number and MOCA is the bottom number. If only one number is published, then it is the MEA and the MOCA is the same figure.
g. Enroute Hold
h. MOCA

92. DME, cross radials, cross radial and bearing, RNAV, LORAN, GPS, station passage if intersection is collocated with a station, ATC announcement of intersection, etc.

93. A VSI (vertical speed indicator) is not required for IFR flight.

94. Rigidity-in-Space is the phenomena that keeps gyros moving. They act on the principle of Newton's Law which states that an object in motion tends to stay in motion, just as an object at rest tends to stay at rest.

95. Gyroscopic Precession. Forces the instrument to provide inaccurate readings and display erroneous information. Most likely to occur at high pitch angles, slow airspeeds, and high power settings, also likely to occur in any situation that demands sudden and abrupt power changes, i.e. takeoff, stall and stall recovery.

96. The attitude indicator is the only instrument that provides both pitch and bank information.

97. The heading indicator responds to changes along the lateral axis.

98. Standard-rate turns are 3* and take 2 minutes to complete a 360* turn. If the turn coordinator was inoperative, a standard-rate turn could be accomplished either by timing the turn and/or matching the bank angle on the attitude indicator to that angle which would normally produce a standard rate turn on the turn coordinator.

99. To maintain a standard rate turn while decreasing airspeed the pilot should decrease the bank angle.

100. The direction seeking instruments in the airplane are the magnetic compass and the automatic direction finder (ADF), if installed, all other instruments rely on the abilities of the pilot to find the direction and 'point' the plane in the right way.

101. Variation and the lines are known as isogonic and agonic.

102. Either turn off/remove the causes of the deviation (which is unrealistic) or follow the corrections deemed necessary and listed on the compass card.

103. Increases.

104. On headings of East and West.

105. North and South

106. Pitot Tube = Airspeed Indicator
Static Port = Airspeed Indicator, Altimeter, Vertical Speed Indicator

107. Yes.

108. TAS, True Airspeed, is the actual speed at which the aircraft is moving through the air.
IAS, Indicated Airspeed, is the speed indicated on the airspeed indicator.
CAS, Calibrated Airspeed, is IAS corrected for installation and instrument errors.
GS, Groundspeed, is the actual speed of the craft over the ground.

109. Absolute Altitude is the height of the aircraft above land.
Density Altitude is Pressure Altitude corrected for non-standard temperature and is found by determining Pressure Altitude then finding the temperature correction on a chart or with the E-6B or with a computer program.
Indicated Altitude is the altitude of the aircraft as per the altimeter.
Pressure Altitude is altitude corrected for non-standard pressure and is

found by setting the altimeter to 29.92 and reading the new altitude/elevation.

True Altitude is the actual altitude of the airplane in relation to sea level. And is equal to pressure altitude when standard atmospheric conditions exist.

110. Actual altitude will be higher than indicated altitude. The altimeter reads changes in pressure and measures them against the 'altimeter setting' or mercury pressure already set into the instrument. This measurement is used to indicate the altitude of the aircraft. If the mercury pressure set into the instrument changes and the pilot does not reset the instrument, then the altimeter reading will be inaccurate.

111. Pitch attitude is based on weight, speed, and center of gravity placement.

112. The pitch instruments are the airspeed indicator, attitude indicator, altimeter, vertical speed indicator, and to a small extent the tachometer.

113. In straight-and-level flight, the primary instrument for pitch is the altimeter, bank is the heading indicator, and power is the airspeed indicator.

114. The VSI, vertical speed indicator, provides both rate and trend information regarding pitch. It is not an accurate instrument because it will show the slightest change in pitch and misrepresent the rate at which that change is affecting the aircraft. In addition, the rate is not considered reliable until six to nine seconds have passed and the instrument in stabilized.

115. When changing airspeed in straight-and-level flight, airspeed is primary for pitch, heading indicator for bank, and tachometer for power.

116. Initially the primary bank instrument is attitude indicator.

117. In a standard-rate turn, the turn coordinator is primary for bank and the altimeter is primary for pitch.

118. Rate of turn varies with TAS and bank angle.

119. In the Airport/Facilities Directory

120. The nav or off flag will remain in the window of the VOR instrument and no Morse code identification will be heard over the navigation radio.

121. A minimum of 10* off course....since full-scale deflection could represent an endless distance off course, it can only be told that you are at least 10* off.

122. Approximately 4* off course.

123. Approximately 24 nm from the station. Derived by dividing the time in seconds (120) by the number of degree change (10) and getting 12 minutes to the station, then multiplying 12 by 2 (because if you can go 120 knots in 60 minutes, you are going 2 nm per minute).

124. 3 gallons

125. The flag on the instrument will "flip" or go to nav when crossing over the station. The CDI needle will also swing through from one side to the other.

126. Bearing = 300 ADF Indicator = 255
ADF Indicator = 135 Magnetic Heading = 320

127. The least error is detected the further from the station the aircraft is.

128. every 30 seconds

129. half mile from the radial

130. 10

131. separation of known IFR traffic and the issuance of safety alerts

132. at least half an hour, preferably an hour or more

133. yes

134. half an hour to an hour after estimated departure time

135. TAS

136. False. ATC will only advise you of traffic that may be a factor to your craft.

137. FSS
138. Another aircraft or an obstacle

139. uncontrolled = FSS and/or ATC controlled = ATC

140. The operating control tower controls that airspace. That airspace is classified as Class D airspace. The upper limit may vary but is generally 3,000' AGL. Radio contact is required prior to entering that airspace.

141. ARTCC informs tower when the system is capable of handling the craft and tower

advises the pilot to contact ARTCC.

142. ARTCC

143. Traffic separation, in TRSAs, no

144. weather information and airport advisories, FSS does NOT act like a tower.

145. You must submit a detailed report to the chief of the ATC facility involved if you are requested to do so. This information is found in the regulations and in NTSB 830.

146. same as #145

147. prior to entering controlled airspace and IMC

148. false, however, you may not accept it unless you have at least a textual description of the procedure

149. cruise

150. A composite flight plan combines an IFR flight plan with a VFR flight plan. Your IFR clearance will not be issued until such time as you activate the IFR portion of your flight plan and your VFR flight plan MUST be closed just as any normal VFR flight plan would be.

151. arrows = taxi and takeoff, but no landing chevrons = no operations

152. 2,400'

153. c

154. the pilot sets the intensity by clicking the microphone
3 = low 5 = medium (and turns PCL on) 7 = high

155. obstacle clearance, no they are set according to the airport and obstacle clearance requirements

156. IFR

157. delete this question

158. Warning Areas are in international airspace and may contain hazards to non-participating aircraft.

159. everyone

160. FSS, no

161. The number listed on the MTR on sectionals indicate VFR or IFR.

162. None of the following airspace affect IFR flights directly, the definition of each follows:

Warning Area - is much like an MOA but involves international boundaries

Restricted Area - contain unusual and often invisible hazards to aircraft

Alert Area - generally include military training aircraft and all pilots are responsible for collision avoidance

Prohibited Area - prohibits flight of ANY kind, generally a matter of national security

ADIZ - Air Defense Identification Zone. The airspace surrounding the U.S. which requires identification of ALL aircraft prior to penetrating domestic borders.

DEWIZ - Distant Early Warning Identification Zone. The same as the ADIZ except it lies only along the Alaskan borders.

Class A - formerly known as Positive Control Area. Includes that airspace above 18,000'

Class B - formerly known as Terminal Control Area. Located at the country's busiest airports.

Class C - formerly known as Airport Radar Service Areas. Located at airports smaller than Class B airports but contain high volumes of traffic.

Class D - formerly known as Control Zones and Transition Areas.

Class E - all controlled airspace not classified in one of the above categories.

Class G - all uncontrolled airspace.

TRSA - Terminal Radar Service Area. Located at airports similar in size to Class C airports, outdated, and being phased out.

163. Class A, B, and C airspace and within 30 miles of Class B and underneath Class C airspace.

164. FDC NOTAMS are listed in a separate publication. All others may be found in the Airport/Facilities Directory.

165. feeder route

166. precision = DH non-precision = at the station, a DME fix, or time

you may also execute a missed approach when you are off course and/or have full scale deflection on the localizer and/or glideslope

167. no, they act as NDBs but are monitored by FCC facilities and not FAA facilities.

168. within 50 miles if it is an enroute facility

169. MAA, Maximum Authorized Altitude, is used to insure that navigation signals being transmitted to the aircraft are from the intended facility and not from a distant facility utilizing the same frequency.

170. at the intersection/fix between the two differing MEAs

171. FSS can receive on that frequency but cannot transmit on it. Transmissions will be made over the VOR frequency.

172. 200 AGL

173. at the outer marker

174. yes, however the approach would be a localizer approach not an ILS.

175. reduce power and/or extend flaps/gear to slow the plane, if no corrective action were taken you may not be able to land the plane upon reaching DH

176. Precision = PAR (Precision Approach Radar) and ILS
Non-Precision = NDB, VOR, LOC, ASR

177. correct the outbound leg to force the inbound leg to one minute (:60), correction would be made by using an algebraic ratio such as
:80 X to work this problem, cross multiply and solve
---- = ---- 80 x 60 = 38X 4800 = 38X 126.32 = X
:38 :60 therefore, you should fly 127 seconds or 2 minutes and 7 seconds outbound to have an inbound leg of one minute.

178. A procedure turn should be completed within 10 miles of the center of the approach area (this may be the airport or the outer marker).

179. Descent from MDA can be initiated once the pilot is in a position to land.

180. Execute the missed approach, notify ATC of your intentions, and proceed to your alternate (unless weather is expected to clear and you would like to hold and try the approach again {not advised})

181. yes

182. A VDP is a Visual Descent Point found on an instrument approach plate and is used as a step-down fix. A VDP represents the point from which you can make a normal descent to a landing, assuming you have the runway in sight and you are starting from the minimum descent altitude. Descent below the MDA should not be executed prior to reaching the VDP even if the field is in sight. VDPs offer obstacle/terrain clearance.

183. Non-standard alternate minimums are noted on the approach plates for the airport. An "A" inside a triangle denotes non-standard minimums and the minimums are listed in the front of the approach plate book. An "A" inside a triangle with NA listed next to it means the airport is not authorized to be used as an alternate.

184. yes

185. one mile

186. 500 feet per minute

187. tell FSS when filing your flight plan (under remarks) no SIDS

188. at least a textual description

189. the MOCA

190. no, an IFR departure is usually given also but is not part of the clearance

191. controlled = when told to do so by the tower
uncontrolled = as soon as practicable

192. when told to do so by the tower

193. identification, type of flight plan, current position/altitude, destination

194. ATC has an identifiable radar marking for your aircraft

195. False, if the plane is VFR the controller may not provide following and no it does not generally include terrain and obstruction clearance.

196. ATC is no longer vectoring the aircraft and the pilot is responsible for the navigation of the plane along the cleared course.

197. When issuing a void time clearance FSS will also provide a time by which ATC

must be advised, generally within 5 minutes of the clearance time, or else a search and rescue may be initiated with ATC, FSS, and CAP which will be paid by the pilot (unless the pilot was injured or had an excusable reason).

198. FSS prior to departure

199. 500 feet per minute or notify ATC

200. if IFR just change altitude, if VFR sidestep the airway before climbing or descending.

201. Sidestep the Victor until reaching a level cruising altitude then realign with the centerline of the airway.

202. When in VMC, all pilots are responsible for collision avoidance. However, the IFR flight plan makes ATC responsible as well.

203. Return to the previous frequency and explain the problem to the controller.

204. Reports must be made at all mandatory reporting points when IFR. VFR flights do not have to report to ATC unless entering their airspace or requesting assistance.

205. The same reports you would be required to make if IFR and/or VFR in a non-radar environment. (see #89)

206. 10 knots or 5%

207. ATC may permit you to transition a Restricted Area, however, will generally vector you around the area.

208. right hand

209. left hand

210. Identify each of the following as either.....

A. Compulsory in a non-radar environment
B. Compulsory regardless of radar service
C. Non-compulsory

"ESTABLISHED IN THE HOLDING PATTERN AT 17.....11,000." B
"DEPARTING HOLDING PATTERN AT 47" C
"LEILA INTERSECTION AT 14, 11,000 HOLDING, REQUEST FURTHER CLEARANCE." A
"VFR ON TOP, CLIMBING TO 12,500" C

"BE ADVISED....TRUE AIRSPEED CHANGED FROM 130 TO 150 KNOTS"
"VOR INBOUND"
"LEAVING 7,000 FOR 12,000"
"LEVEL 10,000"
"MISSED APPROACH, REQUEST CLEARANCE TO WICHITA"
"LAKELAND AT 11, 7,000, IFR, ORLANDO 30, DAYTONA BEACH NEXT"
"EXPERIENCING MODERATE CLEAR ICING AT 10,000, REQUEST 7,000"
"REVISING ORLANDO ESTIMATE TO 26"
"BE ADVISED DME RECEIVER IS INOPERATIVE"
"BE ADVISED RATE OF CLIMB IN EXCESS OF 1,000 FPM"
"BE ADVISED RATE OF CLIMB IS 400 FPM"

211. No reports are required. However, it is advised that the pilot inform ATC of the time and altitude upon entering the hold.

212. delete this question

213. The pilot is required to enter a holding pattern in the most efficient manner possible and to remain within the 'protected' airspace surrounding the hold.

214. Direct, Teardrop, and Parallel. FARs do not require that one of these patterns be used. The only requirements placed on the pilot are that the hold entry be executed in the most efficient manner possible and within 'protected' airspace.

215. Hold clearances may be issued at any point. Generally speaking they are not issued closer than 5 miles. ATC, however, may issue a hold at any point that they deem necessary for the safe and efficient practices of the air traffic system.

216. Outbound times should not be started until the first full leg is being executed. At that time, the pilot should start the time when abeam the station, if already past the station, the pilot should start timing when wings are level.

217. every 100 miles or 15 minutes, whichever comes first

218. "Pilot's discretion" allows a pilot to descend at any point, rate, or speed the pilot deems necessary. ATC will generally request that the descent be made prior to a specific point.

219. STARs may begin at any distance from the destination airport. Some STARs will actually begin at the departure airport while others won't begin until crossing an enroute VOR or other navigation facility.

220. Traffic is usually the determining factor for issuance of STARs. The pilot must,

however, have at least a textual description of the STAR to accept it.

221. NO

222. Minimum Vectoring Altitude. Generally found in mountainous terrain. Does not provide specific clearance, but must be at or above MOCA.

223. Advise ATC of the situation and request an amended clearance/vector.

224. A non-precision approach may be timed from a holding fix. Holding fixes are often used at airports near terrain obstructions (i.e. mountains).

225. The hold must be executed where it is depicted and may not be executed any further from the airport. The same clearance area is available as would be available for any other hold in any other location.

226. Continue straight ahead until reaching the MAP, then execute the published procedure.

227. NO

228. False. A pilot must request a contact approach. A pilot and/or controller may initiate a visual approach.

229. Yes.

230. lower - usually the same as for a straight-in approach

231. ATC expects the sidestep to be executed when the pilot has sight of the airport and can accurately position himself onto final approach for the parallel runway. If ATC 'needs' an earlier sidestep, they will clear the pilot for it.

232. The pilot is *always* responsible for insuring that the flight plan is closed. However, general operating procedure dictates that ATC will close the flight plan once the aircraft is safely on the ground.

233. Appearing to be too high

234. execute a missed approach

235. The Troposphere. The Tropopause acts as a cap to "hold in" the weather.

236. Heat

237. The closer the isobars are, the stronger the gradient. A strong gradient results

in strong winds.

238. The deflection of the wind caused by the earth's rotation. Air is deflected to the right in the northern hemisphere. (An example would be trying to draw a straight line with a marker on a record while the phonograph is spinning).
239. True

240. Evaporation and sublimation

241. As the temperature of an airmass increases the amount of moisture it can hold increases. The air molecules "spread out" when they are heated leaving more room for water molecules to collect.
Remember: there's more humidity in the summer because of the heat.

242. Fog, low clouds, and/or rain. The dewpoint is the point at which air becomes saturated and can no longer "hold" the water molecules. As the temperature nears the dewpoint the air molecules are essentially moving closer together and "squeezing" out the water molecules.

243. supercooled, it is the result of higher temperatures above, it will turn to ice upon making contact with the plane's surface.

244. frost

245. Frost forms when a surface is at or below the dewpoint of the surrounding air and the dewpoint is below freezing.

246. A low ambient lapse rate is found in moist air that is relatively unstable. Ambient lapse rate is the rate at which temperature decreases with an increase in altitude.

247. 9,000'

248. a temperature inversion

249. See question relating to stratus vs. cumulus

250. Cumulonimbus

251. lessens the stability

252. narrow. Fast moving cold fronts force warm air to rise. If sufficient moisture is present, a narrow frontal zone will be created. If there is insufficient moisture, the frontal zone may linger.

253. change in wind direction and usually in wind speed also

254. warm air is displaced by cooler air

255. warm. Warm air is generally found from the surface and rising, so the natural order is for warm air to displace the cooler air, this makes the weather very stable and characteristics of stable air are mentioned in this question.

256. Moisture, heat, and lifting agent

257. Cumulus

258. Mature. During this stage the storm has up and downdrafts, a great deal of turbulence, heavy rain, and possible severe lightning.

259. Squall line

260. Lightning

261. True

262. Cumulonimbus (a.k.a. Towering Cumulus)

263. Try to maintain level flight regardless of speed or altitude. The key is to "keep the shiny side up."

264. A pitch down attitude is likely. Reduce power, level the nose, and establish a constant glide angle.

265. Near the ground, behind large, clean, heavy, fast airplanes. Wingtip vortices from other aircraft. Remain clear of the arrival/departure path of the other aircraft.

266. after theirs

267. Radiation Fog

268. High relative humidity (>70%), and temperatures from 27*F to 100*F.

269. Colder air above

270. False

271. 7,000'

272. Slow the plane and try not to apply brakes on rollout. Hydroplaning is most likely

when there is standing water on the runway and the plane's landing speed is at or above 9 times the square root of the tire pressure.

273. SA = Surface Aviation, Hourly Report, Record Report.
From FSS, the tower, DUAT
FAA Certified Weather Observer (usually the tower)

274.

275.

276.

277.

278.

279.

280.

281.

282. PIREP (Pilot Report). Translated as follows:
Routine Pilot Report....50 nm on the 270 radial from Denver VOR....at 2300 Zulu...flight altitude 20,000 ft....type of aircraft is a Cessna 210...base of broken layer at 8,000 ft tops at 12,000 ft, base of overcast layer at 15,000 ft tops at 17,000 ft....light turbulence....light rime icing from 8,000 ft to 13,000 ft....clear skies

283.

284..

285. FT = Terminal Forecast. Issued 3 times a day. Valid for 24 hours.

286.

287.

288. Both reporting points should be considered and weather maps/charts should be consulted to more accurately determine the weather conditions enroute.

289. FA = Area Forecast. FSS. Issued 3 times a day (every 8 hours). Valid for 24 hours.

290.

291.

292. 250* at 110 knots with a temperature of -15*C

293. 9900+01

294. Significant Weather Prognostic

295. 122.0 "So-and-So Flight Watch, your position, your identification"

296. EFAS = Enroute Flight Advisory Service. Available over navaids enroute.

297. AIRMET, SIGMET, and Convective SIGMET have already been defined and described the others are:

CWA - Center Weather Advisory - an unscheduled weather advisory issued by ARTCC to warn of current or impending weather hazards within the next two hours....often issued with SIGMETs.

WW - Severe Weather Watch Bulletin - weather report that identifies areas of possible severe thunderstorms or tornadoes.

AWW - Severe Weather Forecast Alert - warns forecasters that a WW is being prepared and will soon be issued.

298. False. Those facilities do not normally make "normal" broadcasts of weather so the usage of HIWAS is irrelevant.

299. The jet stream is stronger in the winter.

300. It increases.

301. Tropopause

302. Delete this question

303. Delete this question

304. Declare your emergency on the frequency on which you are already talking.

305. Mayday, Mayday

306. 7500 = Hijacking. 7600 = Radio Failure. 7700 = Emergency

307. Pan-Pan, Pan-Pan

308. An urgent situation may become an emergency situation if special handling is not provided.

309. Land as soon as practicable (regardless of type of flight plan....IF in VFR)

310. Any and all necessary navigation loss must be reported immediately. For example, the loss of a GPS or a LORAN would not require reporting, but the loss of VORs would.

311. Standard rate outside of the outer marker and half standard rate inside it.