

WEATHER THEORY

Temperature, Pressure And Moisture

Every physical process of weather is a result of a heat exchange.

The standard sea level temperature is 15 degrees C. It decreases an average of 2 degrees C per 1,000 feet. The standard temperature for any altitude can be determined by subtracting (from 15 degrees C) 2 degrees C for each 1,000 feet above sea level.

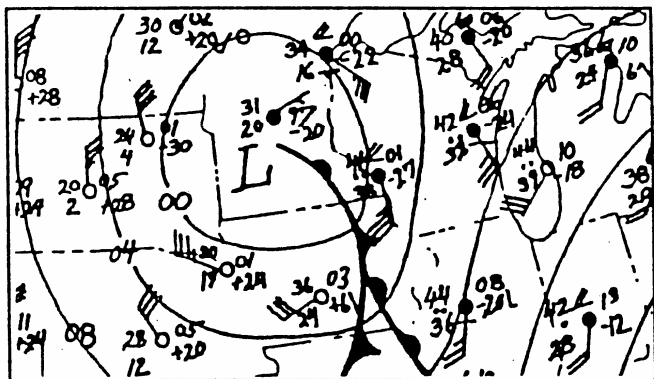
The standard sea level pressure is 29.92" Hg. Pressure decreases one inch per 1,000 feet.

Dewpoint is the temperature to which the air must be cooled to become saturated. Relative humidity (given in percent) is the amount of moisture in the air compared to the amount the air could hold at that temperature. The spread between temperature and dewpoint decreases as relative humidity increases.

Moisture is added to unsaturated air by the process of evaporation and sublimation.

To determine the AGL base of convective cumuliform clouds divide the temperature/dewpoint spread in C° by 25 and multiply your answer by 1000. Example- Temp = 26°C, Dewpoint = 04°C. Divide the difference of 22 by 2.5 to get 8.8 and add three zeros. The bases would be at 8,800 feet AGL.

Pressure Systems and Fronts



A high pressure area is an area of air that is descending, moving outward, and clockwise.

A low pressure area is an area of air that is ascending, moving inward, and counter-clockwise. Wind velocities near the low are greater than farther away.

Pressure Systems (Cont)

Pressure differences cause wind. Above 2000 feet AGL wind flow is parallel to isobars, because the coriolis force tends to counterbalance the horizontal pressure gradient. Isobars close together indicate a strong pressure gradient and stronger winds.

Pressure Systems (Cont)

The difference in surface wind and winds aloft is primarily due to friction between the wind and the surface.

A front is a boundary between two masses of air that differ in temperature, pressure and/or moisture content.

Stability

Stability of the atmosphere can be determined by the ambient (actual) temperature lapse rate.

Warming from below decreases the stability of an air mass.

In general:

| Stability | Stable | Unstable |
|----------------|-----------------------------|-----------------------------|
| Characteristic | Warm air over cold surface. | Cold air over warm surface. |
| Cloud type | Stratiform | Cumuliform |
| Smoothness | Smooth air | Turbulent |
| Frontal type | Warm front | Cold front |
| Precipitation | Steady rain | Showers and thunderstorms |
| Visibility | Poor | Good |

Unstable air forced upward will cause clouds with considerable vertical development and associated turbulence.

Stable air forced upward will cause stratus-type clouds with little vertical development and little or no turbulence.

Temperature Inversions

A temperature inversion exists where there is an increase in temperature as altitude is increased.

The conditions most favorable for the formation of a surface-based inversion are clear, cool nights with calm or light wind.

Lenticular Clouds

Standing lenticular clouds are stationary lens-shaped clouds that show little or no movement, but contain strong winds and turbulence, especially below the clouds.

One of the most dangerous features of mountain waves is the turbulent area in and below rotor clouds, and on the leeward side when flying into the wind.



Wind Shear

Wind shear is a change in wind direction and/ or speed in a horizontal or vertical direction.

It may be encountered during periods of strong temperature inversion and near thunderstorms, and at any level.

If a strong inversion is encountered after takeoff a potential hazard exists because of wind shear turbulence.

During an approach, wind shear can be recognized by monitoring the power and vertical velocity required to remain on the proper glidepath. A sudden decrease in headwind will cause a loss in airspeed equal to the decrease in wind velocity.

in turbulence, adjust airspeed to that recommended for rough air. Control airspeed with power, maintain wings level, and accept variations of altitude.

Light turbulence momentarily causes slight, erratic changes in attitude and/or altitude.

Moderate turbulence causes changes in altitude and/or attitude, but the aircraft control remains positive.

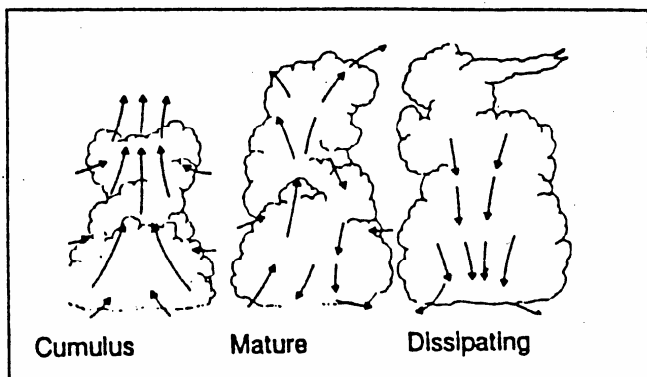
Turbulence that is encountered above 15,000 AGL and not associated with cloudiness should be reported as clear air turbulence.

Thunderstorms

Towering cumulus clouds have convective turbulence, but have not yet become thunderstorms.

Cumulonimbus clouds have the greatest turbulence. Extreme turbulence is indicated by very frequent lightning and roil clouds. Lightning is always associated with thunderstorms. Hail may be thrown outward from a storm cloud for several miles.

The three ingredients needed to form a thunderstorm are unstable air, high humidity, and a lifting action.



Thunderstorms (Cont)

The thunderstorm has 3 stages or life cycles:

CUMULUS (Building) - Continuous updrafts extend from the earth to above the cloud tops.

MATURE - Updrafts and downdrafts are present. This stage is also recognized by rain-fall at the surface. The thunderstorm reaches its greatest intensity.

DISSIPATING - Comprised of downdrafts.

A squall line is a non-frontal narrow band of active thunderstorms that often develop ahead of a cold front. Squall line thunderstorms produce the most severe conditions, such as heavy hail and destructive winds.

A squall is defined as sudden increases in windspeed of at least 15 knots to a sustained speed of 20 knots or more for at least 1 minute.

Airborne radar provides no assurance of avoiding instrument weather conditions.

An intense radar echo should be avoided by a distance of at least 20 miles. if you must fly between intense echoes, have a minimum of 40 miles between echoes.

Virga is precipitation beneath clouds that evaporates before reaching the ground.

Structural icing

Freezing rain is caused by rain falling from air which has a temperature of more than 32 degrees F into air having a temperature of 32 degrees F or less.

Ice pellets at the surface are evidence that freezing rain exists at a higher altitude.

Frost causes the airplane to stall at an angle of attack that is lower than normal.

Fog

Fog produced by frontal activity is a result of saturation due to evaporation of precipitation.

Radiation fog occurs with warm, moist air over low, flatland areas on clear, calm nights.

Advection fog occurs when an air mass moves inland from the coast. It can appear suddenly during day or night, and is more persistent than radiation fog. it requires wind, and can produce turbulence and icing. Winds of greater than 15 knots may tend to lift this fog into low stratus clouds.

Steam fog forms in the winter when cold, dry air passes over warmer water.

The tropopause is characterized by an abrupt change in temperature lapse rate.

The jetstream is an area of strong winds that occurs at the tropopause. It occurs farther south and at a lower altitude, and is stronger in the winter;

Clear air turbulence can be expected on the polar side of a jetstream, or on the low pressure side of a curving jetstream, and is sometimes identified visually by long streaks of cirrus clouds.

5301. I21 COM

Every physical process of weather is accompanied by or is the result of

- A) a heat exchange.
- B) the movement of air.
- C) a pressure differential.

5302. I21 COM

What is the standard temperature at 10,000 feet?

- A) -5 °C.
- B) -15 °C.
- C) +5 °C.

5303.

What is the standard temperature at 20,000 feet?

- A) -15°C
- B) -20 °C
- C) -25°C

5304. I21 COM

Which conditions are favorable for the formation of a surface based temperature inversion?

- A) Clear, cool nights with calm or light wind.
- B) Area of unstable air rapidly transferring heat from the surface.
- C) Broad areas of cumulus clouds with smooth, level bases at the same altitude.

5305. I22 COM

What are the standard temperature and pressure values for sea level?

- A) 15 °C and 29.92 inches Hg.
- B) 59 °F and 1013.2 inches Hg.
- C) 15 °C and 29.92 Mb.

5310.

What causes wind?

- A) The Earth's rotation.
- B) Air mass modification.
- C) Pressure differences.

5311. I23 COM

In the Northern Hemisphere, the wind is deflected to the

- A) right by Coriolis force.
- B) right by surface friction.
- C) left by Coriolis force.

5312. I23 COM

Why does the wind have a tendency to flow parallel to the isobars above the friction level?

- A) Coriolis force tends to counterbalance the horizontal pressure gradient.
- B) Coriolis force acts perpendicular to a line connecting the highs and lows.
- C) Friction of the air with the Earth deflects the air perpendicular to the pressure gradient.

5313. I23 COM

The wind system associated with a low-pressure area in the Northern Hemisphere is

- A) an anticyclone and is caused by descending cold air.
- B) a cyclone and is caused by Coriolis force.**
- C) an anticyclone and is caused by Coriolis force.

5314. I23 COM

With regard to windflow patterns shown on surface analysis charts; when the isobars are

- A) close together, the pressure gradient force is slight and wind velocities are weaker.
- B) not close together, the pressure gradient force is greater and wind velocities are stronger.
- C) close together, the pressure gradient force is greater and wind velocities are stronger.**

5315. I23 COM

What prevents air from flowing directly from high-pressure areas to low-pressure areas?

- A) Coriolis force.
- B) Surface friction.
- C) Pressure gradient force.

5316. I23 COM

While flying cross-country, in the Northern Hemisphere, you experience a continuous left crosswind which is associated with a major wind system. This indicates that you

- A) are flying toward an area of generally unfavorable weather conditions.
- B) have flown from an area of unfavorable weather conditions.
- C) cannot determine weather conditions without knowing pressure changes.

NOTE: CORRECT ANSWER IN BOLD ITALICS



5317.

Which is true with respect to a high- or low- pressure system?

- A) A high-pressure area or ridge is an area of rising air.
- B) A low-pressure area or trough is an area of descending air.
- C) A high-pressure area . or ridge is an area of descending air.**

5318.

Which is true regarding high- or low-pressure systems?

- A) A high-pressure area or ridge is an area of rising air.
- B) A low-pressure area or trough is an area of rising air.**
- C) Both high- and low-pressure areas are characterized by descending air.

5319. I23 COM

When flying into a low-pressure area in the Northern Hemisphere, the wind direction and velocity will be from the

- A) left and decreasing.
- B) left and increasing.**
- C) right and decreasing.

5320. I24 COM

Which is true regarding actual air temperature and dewpoint temperature spread? The temperature spread

- A) decreases as the relative humidity decreases.
- B) decreases as the relative humidity increases.**
- C) increases as the relative humidity increases.

5321.

The general circulation of air associated with a high-pressure area in the Northern Hemisphere is

- A) outward, downward, and clockwise.**
- B) outward, upward, and clockwise.
- C) inward, downward, and clockwise.

5322. I24 COM

Virga is best described as

- A) streamers of precipitation trailing beneath clouds which evaporates before reaching the ground.**
- B) wall cloud torrents trailing beneath cumulonimbus clouds which dissipate before reaching the ground.
- C) turbulent areas beneath cumulonimbus clouds.

5323. I24 COM

Moisture is added to a parcel of air by

- A) sublimation and condensation.
- B) evaporation and condensation.
- C) evaporation and sublimation.**

NOTE: CORRECT ANSWER IN BOLD ITALICS

5324. I24 COM

Ice pellets encountered during flight normally are evidence that

- A) a warm front has passed.
- B) a warm front is about to pass.**
- C) there are thunderstorms in the area.

5325. I24 COM

What is indicated if ice pellets are encountered at 8,000 feet?

- A) Freezing rain at higher altitude.**
- B) You are approaching an area of thunderstorms.
- C) You will encounter hail if you continue your flight.

5326.

Ice pellets encountered during flight are normally evidence that

- A) a cold front has passed.
- B) there are thunderstorms in the area.
- C) freezing rain exists at higher altitudes.**

5327.

When conditionally unstable air with high moisture content and very warm surface temperature is forecast, one can expect what type of weather?

- A) Strong updrafts and stratonimbus clouds.
- B) Restricted visibility near the surface over a large area.
- C) Strong updrafts and cumulonimbus clouds.**

5328. I25 COM

What is the approximate base of the cumulus clouds if the temperature at 2,000 feet MSL is 10 °C. and the dewpoint is 1 °C?

- A) 3,000 feet MSL.
- B) 4,000 feet MSL.
- C) 6,000 feet MSL.**

5329. I25 COM

If clouds form as a result of very stable, moist air being forced to ascend a mountain slope, the clouds will be

- A) cirrus type with no vertical development or turbulence.
- B) cumulus type with considerable vertical development and turbulence.
- C) stratus type with little vertical development and little or no turbulence.**

5330. I25 COM

What determines the structure or type of clouds which will form as a result of air being forced to ascend?

- A) The method by which the air is lifted.
- B) The stability of the air before lifting occurs.**
- C) The relative humidity of the air after lifting occurs.

5331. I25 COM

Refer to the excerpt from the following METAR report:
KTUS 08004KT 4SM HZ 26/04 A2995 RMK RAE36
At approximately what altitude AGL should bases of convective-type cumuliform clouds be expected?

- A) 4,400 feet.
- B) 8,800 feet.**
- C) 17,600 feet.

5332. I25 COM

What are the characteristics of stable air?

- A) Good visibility; steady precipitation; stratus clouds.
- B) Poor visibility; steady precipitation; stratus clouds.**
- C) Poor visibility; intermittent precipitation; cumulus clouds.

5333. I25 COM

Which would decrease the stability of an air mass?

- A) Warming from below.**
- B) Cooling from below.
- C) Decrease in water vapor.

5334.

From which measurement of the atmosphere can stability be determined?

- A) Atmospheric pressure.
- B) The ambient lapse rate.**
- C) The dry adiabatic lapse rate.

5335. I25 COM

What type weather can one expect from moist, unstable air, and very warm surface temperatures?

- A) Fog and low stratus clouds.
- B) Continuous heavy precipitation.
- C) Strong updrafts and cumulonimbus clouds.**

5336. I25 COM

Which would increase the stability of an air mass?

- A) Warming from below.
- B) Cooling from below.**
- C) Decrease in water vapor.

5337. I26 COM

The conditions necessary for the formation of stratiform clouds are a lifting action and

- A) unstable, dry air.
- B) stable, moist air.**
- C) unstable, moist air.

5338. I26 COM

Which cloud types would indicate convective turbulence?

- A) Cirrus clouds.
- B) Nimbostratus clouds.
- C) Towering cumulus clouds.**

5339. I26 COM

The presence of standing lenticular altocumulus clouds is a good indication of

- A) lenticular ice formation in calm air.
- B) very strong turbulence.**
- C) heavy icing conditions.

5340. I27 COM

The formation of either predominantly stratiform or predominantly cumuliform clouds is dependent upon the

- A) source of lift.
- B) stability of the air being lifted.**
- C) temperature of the air being lifted.

5341. I27 COM

Which combination of weather-producing variables would likely result in cumuliform-type clouds, good visibility, and showery rain?

- A) Stable, moist air and orographic lifting.
- B) Unstable, moist air and orographic lifting.**
- C) Unstable, moist air and no lifting mechanism.

5342.

What is a characteristic of stable air?

- A) Stratiform clouds.**
- B) Fair weather cumulus clouds.
- C) Temperature decreases rapidly with altitude.

5343. I27 COM

A moist, unstable air mass is characterized by

- A) poor visibility and smooth air.
- B) cumuliform clouds and showery precipitation.**
- C) stratiform clouds and continuous precipitation.

5344.

When an air mass is stable, which of these conditions are most likely to exist?

- A) Numerous towering cumulus and cumulonimbus clouds.
- B) Moderate to severe turbulence at the lower levels.
- C) Smoke, dust, haze, etc., concentrated at the lower levels with resulting poor visibility.**

NOTE: CORRECT ANSWER IN BOLD ITALICS



5345.

Which is a characteristic of stable air?

- A) Cumuliform clouds.
- B) Excellent visibility.
- C) Restricted visibility.**

5346.

Which is a characteristic typical of a stable air mass?

- A) Cumuliform clouds.
- B) Showery precipitation.
- C) Continuous precipitation.**

5347. I27 COM

Which is true regarding a cold front occlusion? The air ahead of the warm front

- A) is colder than the air behind the overtaking cold front.
- B) is warmer than the air behind the overtaking cold front.**
- C) has the same temperature as the air behind the overtaking cold front.

5348. I27 COM

Which are characteristics of a cold air mass moving over a warm surface?

- A) Cumuliform clouds, turbulence, and poor visibility.
- B) Cumuliform clouds, turbulence, and good visibility.**
- C) Stratiform clouds, smooth air, and poor visibility.

5349. I26 COM

The conditions necessary for the formation of cumulonimbus clouds are a lifting action and

- A) unstable, dry air.
- B) stable, moist air.
- C) unstable, moist air.**

5350. I27 COM

Fog produced by frontal activity is a result of saturation due to

- A) nocturnal cooling.
- B) adiabatic cooling.
- C) evaporation of precipitation.**

5351. I28 COM

What is an important characteristic of wind shear?

- A) It is present at only lower levels and exists in a horizontal direction.
- B) It is present at any level and exists in only a vertical direction.
- C) It can be present at any level and can exist in both a horizontal and vertical direction.**

5352. I28 COM

Hazardous wind shear is commonly encountered

- A) near warm or stationary frontal activity.
- B) when the wind velocity is stronger than 35 knots.
- C) in areas of temperature inversion and near thunderstorms.**

5353. I28 COM

Low-level wind shear may occur when

- A) surface winds are light and variable.
- B) there is a low-level temperature inversion with strong winds above the inversion.**
- C) surface winds are above 15 knots and there is no change in wind direction and windspeed with height.

5354. I28 COM

If a temperature inversion is encountered immediately after takeoff or during an approach to a landing, a potential hazard exists due to

- A) wind shear.**
- B) strong surface winds.
- C) strong convective currents.

5355.

GIVEN:

Winds at 3,000 feet AGL 30 kts

Surface winds Calm

While approaching for landing under clear skies a few hours after sunrise, one should

- A) allow a margin of approach airspeed above normal to avoid stalling.**
- B) keep the approach airspeed at or slightly below normal to compensate for floating.
- C) not alter our approach airspeed, these conditions are nearly ideal.

5356. I28 COM

Convective currents are most active on warm summer afternoons when winds are

- A) light.**
- B) moderate.
- C) strong.

5357. I28 COM

When flying low over hilly terrain, ridges, or mountain ranges, the greatest potential danger from turbulent air currents will usually be encountered on the

- A) leeward side when flying with a tailwind.
- B) leeward side when flying into the wind.**
- C) windward side when flying into the wind.

NOTE: CORRECT ANSWER IN BOLD ITALICS

During an approach, the most important and most easily recognized means of being alerted to possible wind shear is monitoring the

- A) amount of trim required to relieve control pressures.
- B) heading changes necessary to remain on the runway centerline.
- C) power and vertical velocity required to remain on the proper glidepath.**

5359. I28 COM

During departure, under conditions of suspected low-level wind shear, a sudden decrease in headwind will cause

- A) a loss in airspeed equal to the decrease in wind velocity.**
- B) a gain in airspeed equal to the decrease in wind velocity.
- C) no change in airspeed, but groundspeed will decrease.

5360. I29 COM

Which situation would most likely result in freezing precipitation? Rain falling from air which has a temperature of

- A) 32 °F or less into air having a temperature of more than 32 °F.
- B) 0 °C or less into air having a temperature of 0 °C or more.
- C) more than 32 °F into air having a temperature of 32 °F or less.**

5361. I30 COM

Which statement is true concerning the hazards of hail?

- A) Hail damage in horizontal flight is minimal due to the vertical movement of hail in the clouds.
- B) Rain at the surface is a reliable indication of no hail aloft.
- C) Hailstones may be encountered in clear air several miles from a thunderstorm.**

5362. I30 COM

Hail is most likely to be associated with

- A) cumulus clouds.
- B) cumulonimbus clouds.**
- C) stratocumulus clouds.

5363. I30 COM

The most severe weather conditions, such as destructive winds, heavy hail, and tornadoes, are generally associated with

- A) slow-moving warm fronts which slope above the tropopause.
- B) squall lines.**
- C) fast-moving occluded fronts.

5364. I30 COM

Of the following, which is accurate regarding turbulence associated with thunderstorms?

- A) Outside the cloud, shear turbulence can be encountered 50 miles laterally from a severe storm.
- B) Shear turbulence is encountered only inside cumulonimbus clouds or within a 5-mile radius of them.
- C) Outside the cloud, shear turbulence can be encountered 20 miles laterally from a severe storm.**

5365. I30 COM

If airborne radar is indicating an extremely intense thunderstorm echo, this thunderstorm should be avoided by a distance of at least

- A) 20 miles.**
- B) 10 miles.
- C) 5 miles.

5366. I30 COM

Which statement is true regarding squall lines?

- A) They are always associated with cold fronts.
- B) They are slow in forming, but rapid in movement.
- C) They are nonfrontal and often contain severe, steady-state thunderstorms.**

5367.

Which statement is true concerning squall lines?

- A) They form slowly, but move rapidly.
- B) They are associated with frontal systems only.
- C) They offer the most intense weather hazards to aircraft.**

5368. I30 COM

Select the true statement pertaining to the life cycle of a thunderstorm.

- A) Updrafts continue to develop throughout the dissipating stage of a thunderstorm.
- B) The beginning of rain at the Earth's surface indicates the mature stage of the thunderstorm.**
- C) The beginning of rain at the Earth's surface indicates the dissipating stage of the thunderstorm.

5369. I30 COM

What visible signs indicate extreme turbulence in thunderstorms?

- A) Base of the clouds near the surface, heavy rain, and hail.
- B) Low ceiling and visibility, hail, and precipitation static.
- C) Cumulonimbus clouds, very frequent lightning, and roll clouds.**

NOTE: CORRECT ANSWER IN BOLD ITALICS



5370. I30 COM

Which weather phenomenon signals the beginning of the mature stage of a thunderstorm?

- A) The start of rain.
- B) The appearance of an anvil top.
- C) Growth rate of cloud is maximum.

5371. I30 COM

What feature is normally associated with the cumulus stage of a thunderstorm?

- A) Roll cloud.
- B) Continuous updraft.**
- C) Beginning of rain at the surface.

5372. I30 COM

During the life cycle of a thunderstorm, which stage is characterized predominately by downdrafts?

- A) Mature.
- B) Developing.
- C) Dissipating.**

5373. I30 COM

What minimum distance should exist between intense radar echoes before any attempt is made to fly between these thunderstorms?

- A) 20 miles.
- B) 30 miles.
- C) 40 miles.**

5374. I31 COM

Which in-flight hazard is most commonly associated with warm fronts?

- A) Advection fog.
- B) Radiation fog.
- C) Precipitation-induced fog.**

5375. I31 COM

Which is true regarding the use of airborne weather-avoidance radar for the recognition of certain weather conditions?

- A) The radarscope provides no assurance of avoiding instrument weather conditions.**
- B) The avoidance of hail is assured when flying between and just clear of the most intense echoes.
- C) The clear area between intense echoes indicates that visual sighting of storms can be maintained when flying between the echoes.

5376. I31 COM

A situation most conducive to the formation of advection fog is

- A) a light breeze moving colder air over a water surface.
- B) an air mass moving inland from the coastline during the winter.**
- C) a warm, moist air mass settling over a cool surface under no-wind conditions.

5377. I31 COM

Advection fog has drifted over a coastal airport during the day. What may tend to dissipate or lift this fog into low stratus clouds?

- A) Nighttime cooling.
- B) Surface radiation.
- C) Wind 15 knots or stronger.**

5378.

What lifts advection fog into low stratus clouds?

- A) Nighttime cooling.
- B) Dryness of the underlying land mass.
- C) Surface winds of approximately 15 knots or stronger.**

5379. I31 COM

In what ways do advection fog, radiation fog, and steam fog differ in their formation or location?

- A) Radiation fog is restricted to land areas; advection fog is most common along coastal areas; steam fog forms over a water surface.**
- B) Advection fog deepens as windspeed increases up to 20 knots; steam fog requires calm or very light wind; radiation fog forms when the ground or water cools the air by radiation.
- C) Steam fog forms from moist air moving over a colder surface; advection fog requires cold air over a warmer surface; radiation fog is produced by radiational cooling of the ground.

5380. I31 COM

With respect to advection fog, which statement is true?

- A) It is slow to develop, and dissipates quite rapidly.
- B) It forms almost exclusively at night or near daybreak.
- C) It can appear suddenly during day or night, and it is more persistent than radiation fog.**

5381. I32 COM

Which feature is associated with the tropopause?

- A) Constant height above the Earth.
- B) Abrupt change in temperature lapse rate.**
- C) Absolute upper limit of cloud formation.

5382. I32 COM

A common location of clear air turbulence is

- A) in an upper trough on the polar side of a jet stream.**
- B) near a ridge aloft on the equatorial side of a high-pressure flow.
- C) south of an east/west oriented high-pressure ridge in its dissipating stage.

NOTE: CORRECT ANSWER IN BOLD ITALICS

The jet stream and associated clear air turbulence can sometimes be visually identified in flight by

- A) dust or haze at flight level.
- B) long streaks of cirrus clouds.**
- C) a constant outside air temperature.

5384. I32 COM

During the winter months in the middle latitudes, the jet stream shifts toward the

- A) north and speed decreases.
- B) south and speed increases.**
- C) north and speed increases.

5385. I32 COM

The strength and location of the jet stream is normally

- A) weaker and farther north in the summer.**
- B) stronger and farther north in the winter.
- C) stronger and farther north in the summer.

5405.

What wind conditions would you anticipate when squalls are reported at your destination?

- A) Rapid variations in windspeed of 15 knots or more between peaks and lulls.
- B) Peak gusts of at least 35 knots combined with a change in wind direction of 30° or more.
- C) Sudden increases in windspeed of at least 16 knots to a sustained speed of 22 knots or more for at least 1 minute.**

5444.

A pilot reporting turbulence that momentarily causes slight, erratic changes in altitude and/or attitude should report it as

- A) light chop.
- B) light turbulence.**
- C) moderate turbulence.

5445.

When turbulence causes changes in altitude and/or attitude, but aircraft control remains positive, that should be reported as

- A) light.
- B) severe.
- C) moderate.**

5446.

Turbulence that is encountered above 15,000 feet AGL not associated with cumuliform cloudiness, including thunderstorms, should be reported as

- A) severe turbulence.
- B) clear air turbulence.**
- C) convective turbulence.

NOTE: CORRECT ANSWER IN BOLD ITALICS

5447. K02 COM

Which type of jetstream can be expected to cause the greater turbulence?

- A) A straight jetstream associated with a low-pressure trough.
- B) A curving jetstream associated with a deep low-pressure trough.**
- C) A jetstream occurring during the summer at the lower latitudes.

5448. K02 COM

A strong wind shear can be expected

- A) in the jetstream front above a core having a speed of 60 to 90 knots.
- B) if the 5 °C isotherms are spaced between 7° to 10° of latitude.
- C) on the low-pressure side of a jetstream core where the speed at the core is stronger than 110 knots.**

5449.

The Low-level wind shear Alert System (LLWAS) provides wind data and software process to detect the presence of a:

- A) rotating column of air extending from a cumulonimbus cloud.
- B) change in wind direction and/or speed within a very short distance above the airport.**
- C) downward motion of the air associated with continuous winds blowing with an easterly component due to the rotation of the Earth.

5450. N33 COM

One of the most dangerous features of mountain waves is the turbulent areas in and

- A) below rotor clouds.**
- B) above rotor clouds.
- C) below lenticular clouds.

5669. H303 COM

A pilot is entering an area where significant clear air turbulence has been reported. Which action is appropriate upon encountering the first ripple?

- A) Maintain altitude and airspeed.
- B) Adjust airspeed to that recommended for rough air.**
- C) Enter a shallow climb or descent at maneuvering speed.

5741. I30 COM

Which is the best technique for minimizing the wing-load factor when flying in severe turbulence?

- A) Change power settings, as necessary, to maintain constant airspeed.
- B) Control airspeed with power, maintain wings level, and accept variations of altitude.
- C) Set power and trim to obtain an airspeed at or below maneuvering speed, maintain wings level, and accept variations of airspeed and altitude.**