

Lesson 6 Weather

Name: _____

- 1- Every physical process of weather is accompanied by, or is the result of, a
- A- movement of air.
 - B- pressure differential.
 - C- heat exchange.
- 2- What causes variations in altimeter settings between weather reporting points?
- A- Unequal heating of the Earth's surface.
 - B- Variation of terrain elevation.
 - C- Coriolis force.
- 3- A temperature inversion would most likely result in which weather condition?
- A- Clouds with extensive vertical development above an inversion aloft.
 - B- Good visibility in the lower levels of the atmosphere and poor visibility above an inversion aloft.
 - C- An increase in temperature as altitude is increased.
- 4- The most frequent type of ground or surface-based temperature inversion is that which is produced by
- A- terrestrial radiation on a clear, relatively still night.
 - B- warm air being lifted rapidly aloft in the vicinity of mountainous terrain.
 - C- the movement of colder air under warm air, or the movement of warm air over cold air.
- 5- Which weather conditions should be expected beneath a low-level temperature inversion layer when the relative humidity is high?
- A- Smooth air, poor visibility, fog, haze, or low clouds.
 - B- Light wind shear, poor visibility, haze, and light rain.
 - C- Turbulent air, poor visibility, fog, low stratus type clouds, and showery precipitation.
- 6- The wind at 5,000 feet AGL is southwesterly while the surface wind is southerly. This difference in direction is primarily due to
- A- stronger pressure gradient at higher altitudes.
 - B- friction between the wind and the surface.
 - C- stronger Coriolis force at the surface.
- 7- What is meant by the term 'dewpoint'?
- A- The temperature at which condensation and evaporation are equal.
 - B- The temperature at which dew will always form.
 - C- The temperature to which air must be cooled to become saturated.

Lesson 6 Weather

8- The amount of water vapor which air can hold depends on the

A- dewpoint.

B- air temperature.

C- stability of the air.

9- Clouds, fog, or dew will always form when

A- water vapor condenses.

B- water vapor is present.

C- relative humidity reaches 100 percent.

10- What are the processes by which moisture is added to unsaturated air?

A- Evaporation and sublimation.

B- Heating and condensation.

C- Supersaturation and evaporation.

11- Which conditions result in the formation of frost?

A- The temperature of the collecting surface is at or below freezing when small droplets of moisture fall on the surface.

B- The temperature of the collecting surface is at or below the dewpoint of the adjacent air and the dewpoint is below freezing.

C- The temperature of the surrounding air is at or below freezing when small drops of moisture fall on the collecting surface.

12- The presence of ice pellets at the surface is evidence that there

A- are thunderstorms in the area.

B- has been cold frontal passage.

C- is a temperature inversion with freezing rain at a higher altitude.

13- What measurement can be used to determine the stability of the atmosphere?

A- Atmospheric pressure.

B- Actual lapse rate.

C- Surface temperature.

14- What would decrease the stability of an air mass?

A- Warming from below.

B- Cooling from below.

C- Decrease in water vapor.

15- What is a characteristic of stable air?

A- Stratiform clouds.

B- Unlimited visibility.

C- Cumulus clouds.

Lesson 6 Weather

16- Moist, stable air flowing upslope can be expected to

- A- produce stratus type clouds.
- B- cause showers and thunderstorms.
- C- develop convective turbulence.

17- If an unstable air mass is forced upward, what type clouds can be expected?

- A- Stratus clouds with little vertical development.
- B- Stratus clouds with considerable associated turbulence.
- C- Clouds with considerable vertical development and associated turbulence.

18- What feature is associated with a temperature inversion?

- A- A stable layer of air.
- B- An unstable layer of air.
- C- Chinook winds on mountain slopes.

19- What is the approximate base of the cumulus clouds if the surface air temperature at 1,000 feet MSL is 70°F and the dewpoint is 48°F?

- A- 4,000 feet MSL.
- B- 5,000 feet MSL.
- C- 6,000 feet MSL.

20- At approximately what altitude above the surface would the pilot expect the base of cumuliform clouds if the surface air temperature is 82°F and the dewpoint is 38°F?

- A- 9,000 feet AGL.
- B- 10,000 feet AGL.
- C- 11,000 feet AGL.

21- What are characteristics of a moist, unstable air mass?

- A- Cumuliform clouds and showery precipitation.
- B- Poor visibility and smooth air.
- C- Stratiform clouds and showery precipitation.

22- What are characteristics of unstable air?

- A- Turbulence and good surface visibility.
- B- Turbulence and poor surface visibility.
- C- Nimbostratus clouds and good surface visibility.

23- A stable air mass is most likely to have which characteristic?

- A- Showery precipitation.
- B- Turbulent air.
- C- Poor surface visibility.

Lesson 6 Weather

24- The suffix 'nimbus,' used in naming clouds, means

A- a cloud with extensive vertical development.

B- a rain cloud.

C- a middle cloud containing ice pellets.

25- Clouds are divided into four families according to their

A- outward shape.

B- height range.

C- composition.

26- An almond or lens-shaped cloud which appears stationary, but which may contain winds of 50 knots or more, is referred to as

A- an inactive frontal cloud.

B- a funnel cloud.

C- a lenticular cloud.

27- Crests of standing mountain waves may be marked by stationary, lens-shaped clouds known as

A- mammatocumulus clouds.

B- standing lenticular clouds.

C- roll clouds.

28- What clouds have the greatest turbulence?

A- Towering cumulus.

B- Cumulonimbus.

C- Nimbostratus.

29- What cloud types would indicate convective turbulence?

A- Cirrus clouds.

B- Nimbostratus clouds.

C- Towering cumulus clouds.

30- The boundary between two different air masses is referred to as a

A- frontolysis.

B- frontogenesis.

C- front.

31- One of the most easily recognized discontinuities across a front is

A- a change in temperature.

B- an increase in cloud coverage.

C- an increase in relative humidity.

Lesson 6 Weather

32- One weather phenomenon which will always occur when flying across a front is a change in the

- A- wind direction.
- B- type of precipitation.
- C- stability of the air mass.

33- Steady precipitation preceding a front is an indication of

- A- stratiform clouds with moderate turbulence.
- B- cumuliform clouds with little or no turbulence.
- C- stratiform clouds with little or no turbulence.

34- Possible mountain wave turbulence could be anticipated when winds of 40 knots or greater blow

- A- across a mountain ridge, and the air is stable.
- B- down a mountain valley, and the air is unstable.
- C- parallel to a mountain peak, and the air is stable.

35- Where does wind shear occur?

- A- Only at higher altitudes.
- B- Only at lower altitudes.
- C- At all altitudes, in all directions.

36- When may hazardous wind shear be expected?

- A- When stable air crosses a mountain barrier where it tends to flow in layers forming lenticular clouds.
- B- In areas of low-level temperature inversion, frontal zones, and clear air turbulence.
- C- Following frontal passage when stratocumulus clouds form indicating mechanical mixing.

37- A pilot can expect a wind-shear zone in a temperature inversion whenever the windspeed at 2,000 to 4,000 feet above the surface is at least

- A- 10 knots.
- B- 15 knots.
- C- 25 knots.

38- One in-flight condition necessary for structural icing to form is

- A- small temperature/dewpoint spread.
- B- stratiform clouds.
- C- visible moisture.

Lesson 6 Weather

39- In which environment is aircraft structural ice most likely to have the highest accumulation rate?

- A- Cumulus clouds with below freezing temperatures.
- B- Freezing drizzle.
- C- Freezing rain.

40- Why is frost considered hazardous to flight?

- A- Frost changes the basic aerodynamic shape of the airfoils, thereby decreasing lift.
- B- Frost slows the airflow over the airfoils, thereby increasing control effectiveness.
- C- Frost spoils the smooth flow of air over the wings, thereby decreasing lifting capability.

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

- A- unstable air containing an excess of condensation nuclei.
- B- unstable, moist air.
- C- either stable or unstable air.

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

- A- Roll cloud.
- B- Continuous updraft.
- C- Frequent lightning.

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

- A- The appearance of an anvil top.
- B- Precipitation beginning to fall.
- C- Maximum growth rate of the clouds.

44- What conditions are necessary for the formation of thunderstorms?

- A- High humidity, lifting force, and unstable conditions.
- B- High humidity, high temperature, and cumulus clouds.
- C- Lifting force, moist air, and extensive cloud cover.

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

- A- Cumulus.
- B- Dissipating.
- C- Mature.

Lesson 6 Weather

46- Thunderstorms reach their greatest intensity during the

- A- mature stage.
- B- downdraft stage.
- C- cumulus stage.

47- Thunderstorms which generally produce the most intense hazard to aircraft are

- A- squall line thunderstorms.
- B- steady-state thunderstorms.
- C- warm front thunderstorms.

48- A nonfrontal, narrow band of active thunderstorms that often develop ahead of a cold front is known as a

- A- prefrontal system.
- B- squall line.
- C- dry line.

49- If there is thunderstorm activity in the vicinity of an airport at which you plan to land, which hazardous atmospheric phenomenon might be expected on the landing approach?

- A- Precipitation static.
- B- Wind-shear turbulence.
- C- Steady rain.

50- Upon encountering severe turbulence, which flight condition should the pilot attempt to maintain?

- A- Constant altitude and airspeed.
- B- Constant angle of attack.
- C- Level flight attitude.

51- What situation is most conducive to the formation of radiation fog?

- A- Warm, moist air over low, flatland areas on clear, calm nights.
- B- Moist, tropical air moving over cold, offshore water.
- C- The movement of cold air over much warmer water.

52- If the temperature/dewpoint spread is small and decreasing, and the temperature is 62°F, what type weather is most likely to develop?

- A- Freezing precipitation.
- B- Thunderstorms.
- C- Fog or low clouds.

Lesson 6 Weather

53- In which situation is advection fog most likely to form?

- A- A warm, moist air mass on the windward side of mountains.
- B- An air mass moving inland from the coast in winter.
- C- A light breeze blowing colder air out to sea.

54- What types of fog depend upon wind in order to exist?

- A- Radiation fog and ice fog.
- B- Steam fog and ground fog.
- C- Advection fog and upslope fog.

55- Low-level turbulence can occur and icing can become hazardous in which type of fog?

- A- Rain-induced fog.
- B- Upslope fog.
- C- Steam fog.

56- The development of thermals depends upon

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

57- Which is considered to be the most hazardous condition when soaring in the vicinity of thunderstorms?

- A- Static electricity.
- B- Lightning.
- C- Wind shear and turbulence.

58- Convective circulation patterns associated with sea breezes are caused by

- A- warm, dense air moving inland from over the water.
- B- water absorbing and radiating heat faster than the land.
- C- cool, dense air moving inland from over the water.

59- During which period is a sea breeze front most suitable for soaring flight?

- A- Shortly after sunrise.
- B- During the early forenoon.
- C- During the afternoon.

60- Which weather phenomenon is always associated with a thunderstorm?

- A- Lightning.
- B- Heavy rain.
- C- Hail.

Lesson 6 Weather

61- (Refer to Figure 21.) Over which area should a glider pilot expect to find the best lift under normal conditions?

- A- 6
- B- 7
- C- 5.

62- During an IFR cross-country flight you picked up rime icing which you estimate is 1/2" thick on the leading edge of the wings. You are now below the clouds at 2000 feet AGL and are approaching your destination airport under VFR. Visibility under the clouds is more than 10 miles, winds at the destination airport are 8 knots right down the runway, and the surface temperature is 3 degrees Celsius. You decide to

- A- use a faster than normal approach and landing speed.
- B- approach and land at your normal speed since the ice is not thick enough to have any noticeable effect.
- C- fly your approach slower than normal to lessen the 'wind chill' effect and break up the ice