

Weather Theory

TEST PREP

1

Clouds, fog, or dew will always form when

- a. **water vapor condenses.**
- b. relative humidity reaches 100 percent.
- c. water vapor is present.

2

Low level inversions may cause:

- a. **Smoke and dust to be trapped close to the surface.**
- b. Precipitation.
- c. Clearing of the atmosphere close to the surface.

3

If you will be flying with cumulus clouds, you might expect:

- a. A smooth flight and poor visibility.
- b. **A bumpy flight with good visibility.**
- c. A smooth flight with good visibility.

4

What is a characteristic of stable air?

- a. Cumulus clouds.
- b. **Stratiform clouds.**
- c. Unlimited visibility.

5

A temperature inversion would most likely result in which weather condition?

- a. **An increase in temperature as altitude is increased.**
- b. Good visibility in the lower levels of the atmosphere and poor visibility above an inversion aloft.
- c. Clouds with extensive vertical development above an inversion aloft.

6

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

- a. **15 °C and 29.92 inches Hg.**
- b. 59 °F and 29.92 millibars.
- c. 59 °C and 1013.2 millibars.

7

Which weather condition should you expect when flying near cumulus clouds?

- a. **turbulence.**
- b. temperature inversion.
- c. smooth air.

8

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

- a. **air temperature.**
- b. dewpoint.
- c. stability of the air.

9

What is required for thermals to form?

- a. **Solar heating**
- b. Thunderstorms
- c. High humidity

10

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

- a. frontogenesis.
- b. frontolysis.
- c. **front.**

11

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

- a. **heat exchange.**
- b. pressure differential.
- c. movement of air.

12

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. 11,000 feet AGL.
- b. 9,000 feet AGL.
- c. 10,000 feet AGL

13

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

- a. standing lenticular clouds.
- b. roll clouds.
- c. mammatocumulus clouds.

14

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

- a. Atmospheric pressure.
- b. Surface temperature.
- c. Actual lapse rate.

15

The zone between contrasting air masses is called a:

- a. Low pressure area.
- b. Front.
- c. High pressure area.

16

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

- a. stability of the air mass.
- b. wind direction.
- c. type of precipitation.

17

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

- a. Showery precipitation.
- b. **Poor surface visibility.**
- c. Turbulent air.

18

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. **6,000 feet MSL.**
- c. 5,000 feet MSL.

19

Seasonal variations of solar radiation primarily occur because the axis of the Earth is tilted. During June through August the Sun is:

- a. Higher in the sky in the southern hemisphere.
- b. Lower in the sky in the northern hemisphere.
- c. **Higher in the sky in the northern hemisphere.**

20

The variations of solar radiation on the Earth's surface create:

- a. The amount of sunlight entering our atmosphere.
- b. **Changes in weather.**
- c. The amount of precipitation for a given geographical region.

21

Moist, stable air flowing upslope can be expected to

- a. develop convective turbulence.
- b. cause showers and thunderstorms.
- c. **produce stratus type clouds.**

22

Steady precipitation preceding a front is an indication of

- a. cumuliform clouds with little or no turbulence.
- b. **stratiform clouds with little or no turbulence.**
- c. stratiform clouds with moderate turbulence.

23

What causes variations in altimeter settings between weather reporting points?

- a. **Unequal heating of the Earth's surface.**
- b. Coriolis force.
- c. Variation of terrain elevation.

24

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.**

25

The presence of cumulus clouds indicate:

- a. **Unstable air with clearer visibilities.**
- b. Stable air with poor visibility.
- c. Stable air with clear visibility.

26

You define an air mass as:

- a. Low pressure areas.
- b. High pressure areas.
- c. **Large bodies of air with a uniform temperature and moisture.**

27

What is meant by the term 'dewpoint'?

- a. The temperature at which dew will always form.
- b. **The temperature to which air must be cooled to become saturated.**
- c. The temperature at which condensation and evaporation are equal.

28

The standard temperature lapse rate is:

- a. 2°F per 500 feet.
- b. 15°C per 1,000 feet.
- c. **2°C per 1,000 feet.**

29

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.

30

What would decrease the stability of an air mass?

- a. Decrease in water vapor.
- b. Cooling from below.
- c. **Warming from below.**

31

The most frequent type of ground or surface-based temperature inversion is that which is produced by

- a. warm air being lifted rapidly aloft in the vicinity of mountainous terrain.
- b. **terrestrial radiation on a clear, relatively still night.**
- c. the movement of colder air under warm air, or the movement of warm air over cold air.

32

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. stronger Coriolis force at the surface.
- c. **friction between the wind and the surface.**

33

The layers of the atmosphere, beginning at the earth's surface, are:

- a. **Troposphere, stratosphere, and mesosphere.**
- b. Troposphere, mesosphere, and stratosphere.
- c. Stratosphere, mesosphere, and troposphere.

34

How can you determine the stability of an air mass?

- a. Height of the cloud bases.
- b. Winds aloft forecast.
- c. **Observe the cloud formations and type of precipitation.**

35

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

- a. **Evaporation and sublimation.**
- b. Heating and condensation.
- c. Supersaturation and evaporation.

36

Layered clouds are called:

- a. **Stratus.**
- b. Mares' tails.
- c. Cumulus.

37

Clouds are divided into four families according to their

- a. outward shape.
- b. composition.
- c. **height range.**

38

What feature is associated with a temperature inversion?

- a. An unstable layer of air.
- b. **A stable layer of air.**
- c. Chinook winds on mountain slopes.

39

If a flight is made from an area of high pressure into an area of lower pressure without the altimeter setting being adjusted, the altimeter will indicate

- a. lower than the actual altitude above sea level.
- b. **higher than the actual altitude above sea level.**
- c. the actual altitude above sea level.

40

Which atmospheric layer is typified by a relatively small change in temperature?

- a. Mesosphere.
- b. Troposphere.
- c. **Stratosphere.**

41

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 lenticular cloud.**
- c. a funnel cloud.

42

After takeoff you encounter a temperature inversion. You should expect:

- a. Strong surface winds.
- b. Strong convective currents.
- c. **Wind shear.**

43

Static pressure, also known as ambient pressure, is:

- a. **Always present whether an aircraft is moving or at rest.**
- b. Is never present when the aircraft is in motion.
- c. Present only when an aircraft is in motion.

44

What causes sea breezes to move inland?

- a. Water absorbing and radiating heat faster than the land.
- b. Warm, dense air moving inland from over the water to replace cool air that has risen over the land.
- c. **Cool, dense air moving inland from over the water to replace warm air that has risen over the land.**

45

Cold air generally contains:

- a. More suspended water particles.
- b. More water vapor than cold air.
- c. **Less water vapor than warm air.**