

⚠ This quiz has been regraded; your score was not affected.

## Exam 3

- Due Apr 8 at 10pm
- Points 100
- Questions 50
- Available Apr 8 at 8am - Apr 8 at 10pm 14 hours
- Time Limit 60 Minutes

## Instructions

This exam is based on lectures 9-12 and chapters 6-9

- Time limit: 60 minutes
- The timer continues even if you exit the quiz
- One attempt
- Open book/note

This quiz was locked Apr 8 at 10pm.

## Attempt History

	Attempt	Time	Score	Regraded
LATEST	<a href="#">Attempt 1</a>	60 minutes	94 out of 100	94 out of 100

Score for this quiz: 94 out of 100

Submitted Apr 8 at 12:14pm

This attempt took 60 minutes.

⋮
Question 1 2 / 2 pts
Is the density of air affected by temperature?
<input type="radio"/> Yes, hotter air contracts and is therefore less dense.
<input type="radio"/> Yes, colder air expands and is therefore less dense.
<input type="radio"/> Yes, colder air contracts and is therefore less dense.
Correct! <input checked="" type="radio"/> Yes, hotter air expands and is therefore less dense.
⋮
Question 2 2 / 2 pts
Meteorologists use the term microburst to describe

☐ small-scale lightning strokes.

☐ none of these

Correct!

☒ small, intense downbursts of wind.

☐ all of these

☐ intense, short periods of precipitation.



Question 3

2 / 2 pts

Sinkholes form in regions underlain by limestone bedrock, and form due to

☐ the removal of soils adjacent to limestone beds by flowing water.

☐ the extraction of excessive amounts of groundwater.

☐ the effects of salinification of groundwaters.

Correct!

☒ the dissolution of the mineral calcite in the limestone.



Question 4

2 / 2 pts

When water evaporates it \_\_\_\_\_.

☐ releases heat

Correct!

☒ absorbs heat

☐ starts to form clouds

☐ becomes denser



Question 5

2 / 2 pts

Rainwater can easily dissolve limestone to create caves because \_\_\_\_\_.

Correct!

☒ rainwater is slightly acidic

☐ limestone can hold a significant amount of groundwater

☐ limestone is extremely resistant to dissolution

☐ rainwater is cooler



Question 6

2 / 2 pts

Globally, there has been significant development in river delta regions, floodplains, and coastal plains. What is the main reason these regions are so attractive for humans to settle?

- Correct!
- ☒

The land is commonly fertile for agriculture.
- ☐

Water resources are abundant.
- ☐

The land is typically inexpensive to acquire.



Question 7

0 / 2 pts

The highest tsunami inundation elevation ever recorded was July 9, 1958, in Lituya Bay, Alaska, and reached 524 meters above sea level. The cause of the tsunami was

- ☐

a landslide that flowed into Lituya Bay that resulted from reverse slip fault displacement adjacent to Lituya Bay.

You Answered

☒

None of these; the tsunami in Lituya Bay occurred due to wind-driven storm waves.

- ☐

a landslide that flowed into Lituya Bay that resulted from normal slip fault displacement adjacent to Lituya Bay.

Correct Answer

☐

a landslide that flowed into Lituya Bay that resulted from strike-slip fault displacement adjacent to Lituya Bay.



Question 8

2 / 2 pts

What percentage of the world's tornadoes occur in the central U.S.? (enter a number only)

Correct!

70

Between 70 and 70



Question 9

2 / 2 pts

Using the wind directions in this video, what type of air mass is located in the middle of Nebraska?

0:00 / 0:03

Correct!

- ☒ Low pressure
- ☐ High pressure



Question 10

2 / 2 pts

Is there a relationship between the surface of the water table and the topography?

- ☐ No; the surface of a water table is flat-lying because of the influence of pressure gradients in the subsurface.
- ☐ No; the surface of a water table is flat-lying because of the influence of gravity.
- ☐ All of these may be true depending the permeability of an aquifer.

Correct!



Yes; water table surfaces tend to follow topography, and are higher beneath hills and lower in areas where valleys are present.



Question 11

2 / 2 pts

Tsunami inundation limit describes

- ☐ the maximum vertical distance tsunamis encroach over land, relative to the shoreline.
- ☐ the average distance tsunamis encroach over land, relative to the shoreline.
- ☐ the maximum lateral distance tsunamis encroach over land, relative to the shoreline.

Correct!

- ☒ the maximum horizontal distance tsunamis encroach over land, relative to the shoreline.



Question 12

2 / 2 pts

Do tsunamis pose a danger to ships at sea far from shorelines?

☐ No, tsunamis tend to attenuate in deep water and pose no danger to ships.

Correct!

☒ No, tsunamis exhibit small amplitudes in deep water and pose no danger to ships.

☐ Yes, tsunamis with high amplitudes pose a significant danger to ships.

☐ Yes, tsunamis with long wavelengths pose a significant danger to ships.



Question 13

0 / 2 pts

What effect does condensing water vapor have on the temperature of air surrounding it?

☐ It has no effect

You Answered

☒ It has a cooling effect

Correct Answer

☐ It has a warming effect



Question 14

2 / 2 pts

In the U.S., where does most of the warm, moist air needed for thunderstorms come from?

☐ Canada

Correct!

☒ Gulf of Mexico

☐ Pacific Ocean

☐ Atlantic Ocean



Question 15

2 / 2 pts

What percentage of lightning strike victims are killed?

Correct!

☒ 10%

☐ 100%

☐ 70%

☐ 25%

☐ 45%



Question 16

2 / 2 pts

Which of the following types of sinkholes is considered the most hazardous?

☐ All of these are equally hazardous.

☐ dissolution sinkholes

Correct!

☒ collapse sinkholes

☐ cover-subsidence sinkholes



Question 17

2 / 2 pts

During adiabatic expansion,

☐ air parcels expand because of solar heating.

Correct!

☒ air parcels expand because they are losing heat to the ambient air.

☐ air parcels expand because they are gaining heat from ambient air.

☐ air parcels expand due to high relative humidity.



Question 18

2 / 2 pts

As formally defined by meteorologists, the difference in a supercell thunderstorm versus an ordinary thunderstorm is that

☐ supercell thunderstorms do not exhibit rotating updrafts, while ordinary thunderstorms exhibit rotating updrafts.

Correct!

☒ supercell thunderstorms exhibit rotating updrafts, while ordinary thunderstorms do not exhibit rotating updrafts.

☐ supercell thunderstorms only form at low latitudes, while ordinary thunderstorms only form at high latitudes.

☐ supercell thunderstorms only form at high latitudes, while ordinary thunderstorms only form at low latitudes.



Question 19

2 / 2 pts

Atmospheric pressure is a result of

☐ heat contrasts on the surface.

☐ winds blowing over the surface.

Correct!

☒ the weight of the column of air above a location.

☐ the density of the atmosphere.



Question 20

2 / 2 pts

Latent heat is \_\_\_\_\_.

☐ energy that earth radiates outward toward the atmosphere

☐ longwave radiation that is absorbed by greenhouse gases and reradiated back down toward Earth

☐ energy that Earth's atmosphere receives from the sun

Correct!

☒ energy that is absorbed, stored and released as water changes between liquid, solid, and gas



Question 21

2 / 2 pts

Air temperature represents

☐ the amount of heat in the air.

Correct!

☒ the average speed of air molecules in motion.

☐ the minimum speed of air molecules in motion.

☐ the amount of cold in the air.

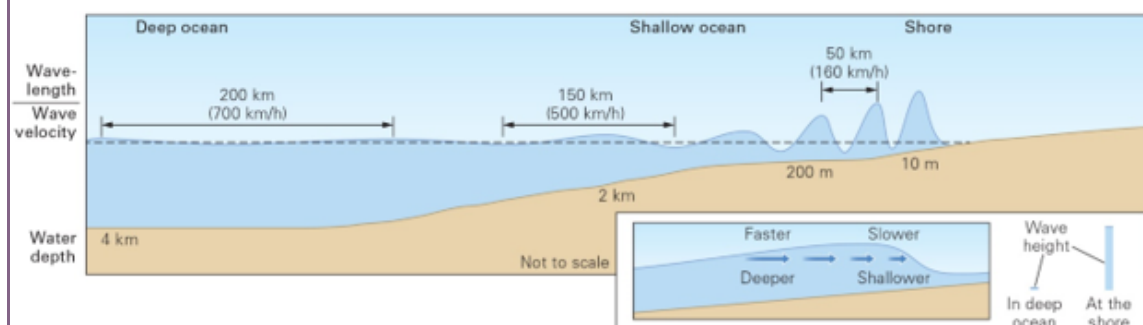
☐ the maximum speed of air molecules in motion.



Question 22

2 / 2 pts

The figure below illustrates changes that occur to tsunamis as they approach shorelines. This process is termed



☐ refraction.

☐ reflection.

☐ attenuation.

Correct!

☒ shoaling.

☐ shallowing.



Question 23

2 / 2 pts

Which process of uplifting an air mass leads to the most severe thunderstorms?

☐ Orographic lifting

☐ Adiabatic lifting

Correct!

☒ Frontal lifting

☐ Convectional lifting



Question 24

2 / 2 pts

Can meaningful tsunami predictions be made, and what is the basis to do so?



Yes, where earthquakes have been predicted, tsunami warnings are typically given with earthquake warnings in coastal areas.

Correct!



No, as the events responsible for tsunamis are themselves unpredictable, it is not possible to predict the onset of a tsunami.

☐ No, tsunamis occur from so many different causes they may be considered to occur randomly.

☐ Yes, slope monitoring along coastal areas is sufficiently reliable to be able to warn of impending tsunamis.



Question 25

2 / 2 pts

Which state in the U.S. has the most days of thunderstorms per year?

☐ Texas

☐ Alabama

Correct!

☒ Florida



☐ Oklahoma

☐ California



Question 26

2 / 2 pts

What is an atmospheric front?

☐ the direction an air mass is moving in response to the pressure gradient force, friction, and the Coriolis effect

Correct!

☒ the boundary between different air masses

☐ the location where an air mass first develops its defining characteristics

☐ the location in an air mass where the isobars start to become more widely spaced



Question 27

2 / 2 pts

Scientific investigations to detect sinkholes include which of the following?

☐ seismic-reflection surveys

☐ ground-penetrating radar surveys

☐ gravity surveys

☐ resistivity surveys

Correct!

☒ all of these



Question 28

2 / 2 pts

Why does the advancement of the leading edge of a warm air mass on a cold air mass often lead to the development of widespread clouds and light rain?



The cold air in front of the the warm front is warmed, which releases latent heat and causes the evaporation of additional water.

Correct!

☒ The warm air is forced up over a gentle slope of cold air and is cooled while doing so, leading to cloud formation and rain.



The advancing warm air pushes under the cold air mass, and that causes compression and the development of rain and clouds in the compressed air.



Preexisting rain and clouds in the cold air mass are spread out by the addition of kinetic energy from the warm air masses.



Question 29

2 / 2 pts

In which region of the Earth would you expect to see the greatest influence from the Coriolis effect on wind?

- ☐ at latitudes 20–30 degrees north and south of the equator
- ☐ at the equator
- ☐ at latitudes between 30–60 degrees north and south of the equator

Correct!

- ☒ at the geographic poles



Question 30

2 / 2 pts

Caves form \_\_\_\_\_ the water table.

- ☐ far above

Correct!

- ☒ just below

- ☐ far below

- ☐ just above



Question 31

2 / 2 pts

Tsunamis that are generated by earthquakes occur most commonly at which type of tectonic plate margin?

- ☐ divergent tectonic boundaries
- ☐ transform tectonic boundaries

Correct!

- ☒ convergent tectonic boundaries



Question 32

Original Score: 2 / 2 pts Regraded Score: 2 / 2 pts

! This question has been regraded.

Do meteorologists have the technological ability to provide accurate detection and warnings once tornadoes form?

- ☐ No
- ☐ Yes, but only based on eyewitness observations reported to the National Weather Service.
- ☐ Yes, using satellite imagery.

Correct!

- ☒ Yes; using Doppler radar systems, rotation in a tornado can be directly detected.



Question 33

2 / 2 pts

The maximum amount of water vapor a 10°C air mass can hold is about 9 g of water per kg of air. If the air mass currently has 4.5 g of water per kg of air, what is its relative humidity?

Correct!

- ☒ 50%
- ☐ 75%
- ☐ 10%
- ☐ 35%



Question 34

0 / 2 pts

Can meaningful tsunami warnings be issued, and what is the basis to do so?

- ☐ No, tsunamis form in such a short amount of time that warnings cannot be meaningful.

You Answered



Yes, warnings can be issued if a triggering event like an earthquake of the appropriate form is detected. Warnings are most valuable for near-field tsunamis.

- ☐ No, the random nature of tsunamis means they are unknown to have occurred until they reach coastlines.

Correct Answer



Yes, warnings can be issued if a triggering event like an earthquake of the appropriate form is detected. Warnings are most valuable for far-field tsunamis.



Question 35

2 / 2 pts

The term derecho refers to

☐ thunderstorm-generated winds that rotate around a central axis.

☐ thunderstorm-generated updraft winds.

Correct!

☒ thunderstorm-generated straight-line winds.

☐ thunderstorm-generated downdraft winds.



Question 36

2 / 2 pts

In zones of high atmospheric pressure, winds result from descending air at higher altitudes, promoting

☐ stormy weather.

☐ extensive cloud development.

Correct!

☒ clear skies.

☐ unusually warm temperature.



Question 37

2 / 2 pts

What is the difference between a tsunami watch and a tsunami warning?

Correct!



A tsunami watch is issued when recent events may have produced a tsunami; a tsunami warning is issued when a known tsunami is approaching.



A tsunami warning is issued when recent events may have produced a tsunami; a tsunami watch is issued when a known tsunami is approaching.

☐ None of these, the terms are interchangeable and have the same meaning.



A tsunami watch is issued when large storms are forming; a tsunami warning is issued when a large storm is producing large wind-driven waves.



Question 38

2 / 2 pts

Orographic lifting occurs in which environment(s) on Earth?

☐ over the oceans of the Earth

Correct!

- ☒ over mountainous regions of the Earth with high elevations
- ☐ over vast portions of the continents at low elevations near sea level
- ☐ none of these
- ☐ All of these are possibilities.



Question 39

2 / 2 pts

One strategy to reduce agricultural losses from hailstorms is

- ☐ to use long-term weather forecasts to make decisions about the type of crop to plant.

Correct!

- ☒ to install hail nets over fields to reduce crop losses.
- ☐ all of these
- ☐ none of these
- ☐ to concentrate crop fields so there is less probability of a storm impacting a particular area.



Question 40

2 / 2 pts

Approximately 60 NOAA DART stations have been deployed in the Pacific Ocean, with more planned for other ocean basins round the world. How do the DART stations work?

- ☐ DART stations detect seismic surface waves moving along the seafloor.

Correct!

- ☒ DART stations use pressure sensors on the seafloor to detect the pressure of a passing tsunami to send alerts when a tsunami is detected.
- ☐ DART stations serve as relay networks to speed announcements of an oncoming tsunami.
- ☐ DART stations detect vertical displacements in the water column that may be from tsunamis or wind-driven waves.



Question 41

2 / 2 pts

In which of the following locations are severe thunderstorms commonly found?

- ☐ on the leeward side of mountains, where air is rapidly descending
- ☐ at high latitudes where the average surface albedo is high

Correct!

- ☒ at the collision of weather-system fronts

☐ in the center of high-pressure systems



Question 42

2 / 2 pts

Drawback, as it relates to tsunamis, describes the condition in which

- ☐ sea surface level drops due to downwelling of water.
- ☐ sea surface level drops to minimum levels at low tide.
- ☐ sea surface level drops are related offshore-oriented winds.

Correct!

- ☒ sea surface level drops due to the arrival of the trough of the tsunami wave.
- ☐ sea surface level begins to drop following maximum high tide.



Question 43

2 / 2 pts

A measure of human comfort that depends on temperature and relative humidity is called the

- ☐ relative comfort scale.

Correct!

- ☒ heat index.
- ☐ comfort index.
- ☐ heat scale.



Question 44

2 / 2 pts

Clouds at ground level are referred to as

Correct!

- ☒ fog.
- ☐ cirrus clouds.
- ☐ stratus clouds.
- ☐ cumulus clouds.



Question 45

2 / 2 pts

How does hail form?

Correct!

☒ Strong updraft in a thunderstorm keeps ice particles in the atmosphere, allowing them to grow larger.

☐ Rain freezes as it falls to the surface in a thunderstorm.

☐ A winter storm can turn snow into hail with extremely cold temperatures.



Question 46

2 / 2 pts

A mesocyclone is considered by meteorologists to represent

☐ tornadoes.

☐ hurricanes that form in the Atlantic Ocean.

Correct!

☒ small-scale rotating updrafts at the center of a supercell thunderstorm.

☐ typhoons that occur in the Pacific Ocean.



Question 47

2 / 2 pts

Meteorologists refer to the environmental lapse rate to describe

Correct!

☒ the rate at which rising parcels decrease in temperature.

☐ the rate at which rising parcels increase in temperature.

☐ the rate at which atmospheric pressure is increasing in rising parcels.

☐ the rate at which atmospheric pressure is decreasing in rising parcels.



Question 48

2 / 2 pts

Hail is common in many thunderstorms. It forms as a result of

☐ none of these

☐ all of these

☐ downdrafts from thunderstorms.

Correct!

☒ updrafts into thunderstorms.

☐ rotation that develops in thunderstorms.



Question 49

2 / 2 pts

What is the most important control on the amount of water vapor that the atmosphere can hold?

☐ atmospheric pressure

☐ altitude

☐ wind speed

Correct!

☒ temperature



Question 50

2 / 2 pts

99.9% of the Earth's atmosphere exists within \_\_\_\_\_ of Earth's surface.

☐ 0.5 kilometers

Correct!

☒ 50 kilometers

☐ 5.0 kilometers

☐ 25 kilometers

☐ 100 kilometers

Quiz Score: 94 out of 100