

Earth System Science 5: The Atmosphere  
Homework #4 answer sheet (due 5/15/2008)

Name \_\_\_\_\_ Student ID \_\_\_\_\_

Please turn in ONLY this answer sheet

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Name \_\_\_\_\_ Student ID: \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) You would most likely expect a rain shadow on the:
  - A) west side of the Coast Range in California.
  - B) west side of the Andes.
  - C) west side of the Sierra Nevada Mountains.
  - D) east side of the Cascade Mountains in the Pacific Northwest.
- 2) Stratocumulus clouds are considered:
  - A) high clouds.
  - B) clouds with extensive vertical development.
  - C) middle clouds.
  - D) low clouds.
- 3) High clouds:
  - A) are composed of ice crystals.
  - B) have a typical ceiling around 4500 meters.
  - C) have a fairly large water content.
  - D) include altostratus clouds.
- 4) Absolutely stable air:
  - A) needs a push to rise, but will continue rising once it starts moving.
  - B) has a wet adiabatic lapse rate that is greater than the environmental lapse rate.
  - C) will have a positive buoyancy.
  - D) is typically warmer than its surroundings.
- 5) Conditionally unstable air:
  - A) moves through an environmental lapse rate that is between the dry adiabatic lapse rate and the wet adiabatic lapse rate.
  - B) always has a negative buoyance.
  - C) contains a mixture of absolutely stable air and absolutely unstable air.
  - D) rarely provides precipitation.
- 6) This is not a form of low cloud:
  - A) nimbostratus.
  - B) stratocumulus.
  - C) stratus.
  - D) nimbostratus.

- 7) The lapse rate of the atmosphere as measured by a radiosonde is called the \_\_\_\_\_ lapse rate.
  - A) moist adiabatic
  - B) stable
  - C) environmental
  - D) autoconvective
  - E) dry adiabatic
- 8) The lower atmosphere is most likely to have the steepest environmental lapse rate at this time:
  - A) mid-day.
  - B) sunrise.
  - C) midnight.
  - D) sunset.
- 9) Inversions:
  - A) are characterized by an increase in temperature with altitude.
  - B) are typically unstable.
  - C) increase the positive buoyancy of most air masses that enter them.
  - D) have no significant effect on fog formation.
- 10) This type of air will keep rising after an initial upward push:
  - A) statically stable air.
  - B) air that is colder and denser than surrounding air.
  - C) statically neutral air.
  - D) statically unstable air.
- 11) If air becomes progressively warmer and more buoyant than the surrounding air, it is said to be:
  - A) absolutely unstable.
  - B) absolutely stable.
  - C) conditionally unstable.
  - D) neutral.

- 12) When the environmental lapse rate exceeds both the dry adiabatic lapse rate and the wet adiabatic lapse rate of a parcel of air, that air parcel contains:
- A) air that cannot reach the lifting condensation level.
  - B) conditionally unstable air.
  - C) absolutely unstable air.
  - D) absolutely stable air.
- 13) Clouds that are high and are always composed entirely of ice crystals are:
- A) thunderheads.
  - B) cirrus.
  - C) alto.
  - D) nimbus.
  - E) stratus.
- 14) Frontal lifting:
- A) leads to increased pressure on the warm front.
  - B) is not related to temperature differences between air masses.
  - C) is most pronounced when a cold front meets a cold front.
  - D) can act in a way that is analogous to orographic lifting.
- 15) This is not one of the three processes for saturating air with water vapor:
- A) adding water vapor to the air.
  - B) lowering the temperature to the dew point.
  - C) mixing cold air with warm, moist air.
  - D) increasing the carbon dioxide content of air.