

## In-Class Review Questions

Here are a variety of questions, asked in formats that you will find on the exam. Please use these questions and the additional review material to help prepare you for the exam.

### Short-Answer

- 1) What is the difference between “temperature” and “heat”?  
Temperature is a measure of average kinetic energy of a substance. Heat is a measure of energy produced by motion of molecules in a substance.
- 2) What factors influence solar insolation?  
Length of Day  
Solar Angle (think beam spreading and depletion)  
Distance from earth
- 3) Name two different greenhouse gases. Why are they called “greenhouse” gases?  
Water Vapor and Carbon Dioxide. Greenhouse gases absorb and emit longwave radiation, thereby “trapping” longwave energy in the atmosphere and redirecting it back down to the surface of the Earth, keeping the atmosphere warmer.
- 4) How does the solar zenith angle change in the northern hemisphere from the summer to the winter? How does that impact beam spreading and beam depletion, as well as solar insolation?  
The solar zenith angle increases from summer to winter (sun is closer to the horizon during the day). The sun's energy travels along a longer path during the winter and therefore more beam spreading and depletion occurs. This reduces the amount of solar insolation during the winter months.
- 5) Which force impacts winds near the surface of the earth, causing them to traverse across isobars (lines of constant pressure)?  
Friction! Frictional forces are only considered near the surface of the earth, not farther up in the atmosphere.

### True/False

- 1) T/**F** The Earth's atmosphere has a well-defined top at 100km above the surface
- 2) T/**F** Condensation is the process of converting liquid water to water vapor (gas phase)
- 3) **T**/F Sand has a lower specific heat than water
- 4) **T**/F Non-selective scattering scatters all wavelengths of light

### Multiple-Choice

1) Which option below is not an example of “weather”, as defined by the technical definition of meteorology?

- A. Rain in Lubbock yesterday
- B. Annual rainfall average**
- C. High temperature today
- D. 25 knot gust of wind at 4:45pm

2) Weather occurs in the

- A. Stratosphere
- B. Ionosphere
- C. Troposphere**
- D. Mesosphere

3) If the dew point temperature is 34 degrees F, and the air is saturated, what is the air temperature in degrees F?

- A. 32
- B. 40
- C. 34**
- D. 0

4) The Earth is nearest the sun during which season:

- A. Winter**
- B. Spring
- C. Summer
- D. Fall

5) Potential energy in the atmosphere is due to:

- A. temperature
- B. molecular collisions
- C. pressure
- D. position**

6) Which two forces in the atmosphere are associated with hydrostatic equilibrium (i.e. vertical force balance):

- A. Coriolis and Pressure Gradient
- B. Gravity and Coriolis
- C. Pressure Gradient and Gravity**
- D. Centrifugal and Friction