Meteorology Stability and Cloud Questions

1. You are driving in your car, and suddenly your windows start fogging up from the inside. Is it better to turn on the defrost heater or the air conditioner? What does each device do to the car interior’s air?

1. On very humid days, we often say the air “feels” heavy. Is moist air denser than dry air at the same temperature? (Hint: Adding water vapor to the air increases the value of the “gas constant” r in the ideal gas law. Remember P = ρ r T; where P =pressure, ρ = density, T = Temperature, and r is the gas constant.) Explain.

1. We saw that we have warm air at the ground and bitterly cold air at the tropopause, just a few miles up, and yes, we saw the density decrease with height, and that’s why the troposphere is not turning over. But why don’t we give some of this warm air to the upper troposphere, and why don’t we just grab some of that cold air down and bring it to the surface?

1. How might thunderstorms be different, in intensity and/or depth, if all of the atmosphere’s ozone completely and permanently disappeared?

1. You heat a vessel full of water. After is starts boiling, you remove the vessel from the heat and set it aside. After the boiling motion ceases, you dip a metal spoon into the upper layer of the water. The water begins boiling again. Why?

1. What is the difference between a parcel of air that is classified as absolute stable and absolute instable?
2. How are Rotor clouds formed?

1. What is the difference between the wet adiabatic lapse rate (WALR) and the dry adiabatic lapse rate (DALR)? Why?

1. What is the difference between the Lifting condensation Level (LCL) and the Level of free-convection (LFC) for a parcel of air that is classified as conditionally unstable?

1. Why is there a dew point lapse rate? What is it?

1. What are the 4 Lapse Rates in Meteorology?

1. What is the Environmental Lapse Rate (ELR) and how can it be negative?

1. What causes the Equilibrium Level or (Top of the Cloud) layer?

1. What does forced convection mean and why is important?

1. Give 3 reasons why a cloud doesn’t release a storm?

1. Why are the winds coming off a leeward side of a mountain range hotter and dryer than the windward side?

1. Where do you find Lenticular clouds?
2. Describe Altocumulas clouds?
3. Describe a Cumulonimbus cloud?
4. Describe a Nimbostratus cloud?