Practice Quiz - Phases and Intermolecular Forces **Name**_____

1. (3 points)Diethyl ether, used as a solvent for extraction of organic compounds from aqueous solutions, has a high vapor pressure which makes it a potential fire hazard in laboratories in which it is used. How much energy is released when 100.0 g is cooled from 53.0°C to 10.0°C?

   Boiling point: 34.5°C
   Heat of vaporization: 351 J/g
   Specific heat capacity, $(CH_3)_2O(l)$: 3.74 J/(g · K)
   Specific heat capacity, $(CH_3)_2O(g)$: 2.35 J/(g · K)

   A. 10.1 kJ B. 13.1 kJ C. 16.1 kJ D. 45.2 kJ E. 48.6 kJ

2. (3 points) A 5.00 g sample of water vapor, initially at 155°C is cooled at atmospheric pressure, producing ice at -55°C. Calculate the amount of heat energy lost by the water sample in this process, in kJ. Use the following data: specific heat capacity of ice is 2.09 J/g · K;
   specific heat capacity of liquid water is 4.18 J/g · K;
   specific heat capacity of water vapor is 1.84 J/g · K;
   heat of fusion of ice is 336 J/g;
   heat of vaporization of water is 2260 J/g.

   A. 16.1 kJ B. 10.2 kJ C. 5.4 kJ D. 3.2 kJ E. 15.1 kJ

   The rest of the questions are each 2 points.

3. Neon atoms are attracted to each other by
   A. dipole-dipole forces. B. London dispersion forces. C. hydrogen bonding.
   D. covalent bonding. E. intramolecular forces.

4. Ammonia's unusually high melting point is the result of
   A. dipole-dipole forces. B. London dispersion forces. C. hydrogen bonding.
   D. covalent bonding. E. ionic bonding.

5. In hydrogen iodide _____ are the most important intermolecular forces.
   A. dipole-dipole forces B. London dispersion forces C. hydrogen bonding
   D. covalent bonds E. polar covalent bonds

6. What word is used to describe a direct phase change from the solid phase to the gas phase?

7. Why is carbon dioxide a gas at room temperature whereas silicon dioxide is a solid (sand)?

8. What conditions have to exist for hydrogen bonding to take place between molecules?

9. Considering the three phases: gas, liquid and solid - which phase has the most energy and why?