Please show all formulas and all work to receive any credit

- 1. The electron configuration for an iron atom is [Ar] $4s^2 3d^6$. For the Fe(H₂O)₆²⁺ complex,
 - a. Draw an energy level diagram showing each of the occupied outer electron orbitals of the iron ion. Clearly show how many electrons are in each orbital.

- b. Define Lewis acid and Lewis base; identify the Lewis base and the Lewis acid in the complex.
- 2. Compare the vapor pressures of C₃H₇OH, CH₃OCH₂CH₃, and CH₃CH₂CH₃ following these steps:
 - a. Draw correct Lewis structures for each.
 - b. Identify all the intermolecular forces of attraction that exist between like molecules for each of these three substances.

c. Define vapor pressure and draw a diagram to clearly explain its definition.

- d. Rank order these compounds in terms of increasing vapor pressure.
- e. Fully support your predictions using fundamental physical principles and appropriate diagrams.