Chemistry 137 Name Jordan Pierre

Practice Problems Chapter 6

1. Answer the following questions:
(a) Without using quantum numbers, describe the differences between the shells, subshells, and orbitals of an atom.
(b) How do the quantum numbers of the shells, subshells, and orbitals of an atom differ?

(a) A shell contains one or more subshells. Subshells however contain orbitals and an Orbital can contain one or two electrons
(b) They differ because each one describes something different: **shell**, describes the distance of the electron from the nucleus; **subshell**, describes the function; **orbital**, describes the shape

2. State the Heisenberg uncertainty principle. Describe briefly what the principle implies.

States that it is impossible to know simultaneously the exact position and momentum of a particle. It implies that the more precise you measure a particle's exact position, the less you can find out about the other. (vice versa)

3. Write a set of quantum numbers for each of the electrons with an *n* of 3 in a Sc atom.

$3s^2$ $3p^6$ $3d^1$ $4s^2$

4. Based on their positions in the periodic table, predict which has the smallest first ionization energy: Li, Cs, N, F, I.

Cs