WS 13.5 Name: Key p.

1. Write the electron configuration for Cu and Sn, without using the noble gas abbreviation.

Ni #28 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$

Sn #50 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^2$

2a. Explain why the electrons in the n = 4 level generally have more energy than those in the n = 3 level.

Electrons in n=4 are further from nucleus than n=3. Since electrons are negative and the nucleus is positive, the electrons are attracted to the nucleus, and therefore electrons will have lower potential energy when closer to nucleus.

b. Though n = 4 generally has higher energy than n = 3, there is an exception: Electrons fill the 4s orbital before they occupy the 3d orbitals. Why would electrons have lower potential energy by filling 4s before they fill 3d?

Since e- are all negatively charged, they all repel each other. So once there are 8 electrons in n=3 ($3s^2 3p^6$), the next 2 electrons occupy 4s instead of 3d so that they can be further away from the other electrons.

3. Write the electron configurations for the following elements, using the noble gas abbreviation.

Ni $[Ar] 4s^2 3d^8$

Sn $[Kr] 5s^2 4d^{10} 5p^2$

#83 Bi $[Xe] 6s^2 4f^{14} 5d^{10} 6p^3$

#35 Br $[Ar] 4s^2 3d^{10} 4p^5$

Xe $[Kr] 5s^2 4d^{10} 5p^6$

Fe $[Ar] 4s^2 3d^6$

Al $[Ne] 3s^2 3p^1$

U $[Rn] 7s^2 5f^4$

Pb $[Xe] 6s^2 4f^{14} 5d^{10} 6p^2$

Rn $[Xe] 6s^2 4f^{14} 5d^{10} 6p^6$

Sr $[Kr] 5s^2$

Cf $[Rn] 7s^2 5f^{10}$

4. a. How is the Modern Quantum Mechanical Model (MQMM) similar to the Bohr model?

b. How is the MQMM different from the Bohr model?

5. Write the electron configurations for the following elements. OK to use the noble gas abbreviation.

V $[Ar] 4s^2 3d^3$

I $[Kr] 5s^2 4d^{10} 5p^5$

Pu $[Rn] 7s^2 5f^6$

N $1s^2 2s^2 2p^3$

Ba $[Xe] 6s^2$

Po $[Xe] 6s^2 4f^{14} 5d^{10} 6p^4$

As $[Ar] 4s^2 3d^{10} 4p^3$

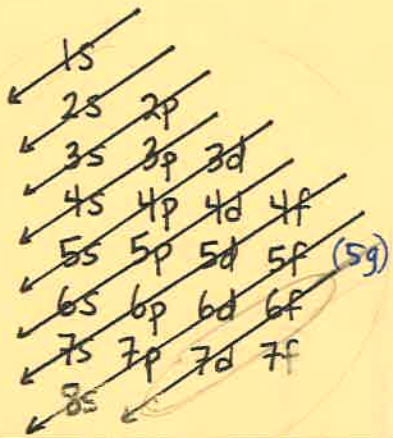
Mg $[Ne] 3s^2$

B $1s^2 2s^2 2p^1$

Pt $[Xe] 6s^2 4f^{14} 5d^8$

Hg $[Xe] 6s^2 4f^{14} 5d^{10}$

Am $[Rn] 7s^2 5f^7$



Li $1s^2 2s^1$

Be $1s^2 2s^2$

B $1s^2 2s^2 2p^1$

Na $1s^2 2s^2 2p^6 3s^1$

	IA	IIA											IIIA	IVA	VA	VIA	VIIA	VIIIA
1	Hydrogen $1s^1$																	Helium $1s^2$
2	Lithium $2s^1$	Beryllium $2s^2$											Boron $2p^1$	Carbon $2p^2$	Nitrogen $2p^3$	Oxygen $2p^4$	Fluorine $2p^5$	Neon $2p^6$
3	Sodium $3s^1$	Magnesium $3s^2$											Aluminum $3p^1$	Silicon $3p^2$	Phosphorus $3p^3$	Sulfur $3p^4$	Chlorine $3p^5$	Argon $3p^6$
4	Potassium $4s^1$	Calcium $4s^2$	Scandium $3d^1$	Titanium $3d^2$	Vanadium $3d^3$	Chromium $3d^4$	Manganese $3d^5$	Iron $3d^6$	Cobalt $3d^7$	Nickel $3d^8$	Copper $3d^9$	Zinc $3d^{10}$	Gallium $4p^1$	Germanium $4p^2$	Arsenic $4p^3$	Selenium $4p^4$	Bromine $4p^5$	Krypton $4p^6$
5	Rubidium $5s^1$	Strontium $5s^2$	Yttrium $4d^1$	Zirconium $4d^2$	Niobium $4d^3$	Molybdenum $4d^4$	Technetium $4d^5$	Ruthenium $4d^6$	Rhodium $4d^7$	Palladium $4d^8$	Silver $4d^9$	Cadmium $4d^{10}$	Indium $5p^1$	Tin $5p^2$	Antimony $5p^3$	Tellurium $5p^4$	Iodine $5p^5$	Xenon $5p^6$
6	55 Cesium $6s^1$	56 Barium $6s^2$	71 Lutetium $5d^1$	72 Hafnium $5d^2$	Tantalum $5d^3$	Tungsten $5d^4$	Rhenium $5d^5$	Osmium $5d^6$	Iridium $5d^7$	Platinum $5d^8$	Gold $5d^9$	Mercury $5d^{10}$	Thallium $6p^1$	Lead $6p^2$	Bismuth $6p^3$	Polonium $6p^4$	Astatine $6p^5$	Radon $6p^6$
7	87 Francium $7s^1$	88 Radium $7s^2$	103 Lawrencium $6d^1$	104 Rutherfordium $6d^2$	Dubnium $6d^3$	Seaborgium $6d^4$	Bohrium $6d^5$	Hassium $6d^6$	Meitnerium $6d^7$	Ununnilium $6d^8$	Unununium $6d^9$	Ununbium $6d^{10}$						

Darmstadtium (Ds)

Roentgenium (Rg)

57 Lanthanum $4f^1$	58 Cerium $4f^2$	Praseodymium $4f^3$	Neodymium $4f^4$	Promethium $4f^5$	Samarium $4f^6$	Europium $4f^7$	Gadolinium $4f^8$	Terbium $4f^9$	Dysprosium $4f^{10}$	Holmium $4f^{11}$	Erbium $4f^{12}$	Thulium $4f^{13}$	70 Ytterbium $4f^{14}$
89 Actinium $5f^1$	90 Thorium $5f^2$	Protactinium $5f^3$	Uranium $5f^4$	Neptunium $5f^5$	Plutonium $5f^6$	Americum $5f^7$	Curium $5f^8$	Berkelium $5f^9$	Californium $5f^{10}$	Einsteinium $5f^{11}$	Fermium $5f^{12}$	Mendelevium $5f^{13}$	102 Nobelium $5f^{14}$