Show your work.

$E = h\upsilon$

$\upsilon = c/\lambda$

$h = 6.626 \times 10^{-34}$ J*sec

$c = 2.997 \times 10^8$ m/sec

29.57 ml = 1 ounce

0.62 mile = km

ih $\delta/\delta t\, \psi = \Re\psi$

$\Delta x \Delta mv = h/4\pi$

$\lambda = h/mv$

$1/\lambda = 1.097 \times 10^{-2}$ nm^{-1}(1/m^2 – 1/n^2)

J = kgm^2/sec^2

28.35 g = 1 ounce

Each question is worth 2 points

1.   Which of the following describes filling electronic energy levels from lowest to highest energy. (The lowest energy orbitals are filled first.)

a.   Hund's rule
b.   Heisenberg uncertainty principle
c.   Effective nuclear charge
d.   Auf bau principle

e.   Strong nuclear force
f.   Weak electrical attraction
g.   Pauli Exclusion principle

2.   Which of the following describes filling all of the orbitals that have the same energy with one electron before spin pairing electrons?

a.   Hund's rule
b.   Heisenberg uncertainty principle
c.   Effective nuclear charge
d.   Auf bau principle

e.   Strong nuclear force
f.   Weak electrical attraction
g.   Pauli Exclusion principle

3.   What is the uncertainty in the position of an electron that has a mass of 9.11×10^{-31} kg and its velocity is 1.6×10^6 m/sec +/- 10%.

4.   Arrange the following atoms in order from smallest diameter to largest diameter:

a. C>Ga>F>Si>N>Rb
b. C<F<Si<Ga<Nb<Rb
c. F<C<Si<Ga<Nb<Rb

d. C<F<Si<Nb<Ga<Rb
e. C<F<Si<Ga<Nb<Rb

5.   The electron configuration for a lithium atom is: 1s^2 2s^1. What is the electron configuration for an Iron atom?

6.   Write the principle quantum numbers for the last electron in a neon atom.

7.   How many electrons are in the outermost shell (valence shell) for each of the following atoms:

a. oxygen_____b. sulfur _____ c. magnesium_____ d. bromine_____

8.   What atom in the third row is the smallest? Why is it the smallest?

9.   Why are s orbitals lower in energy (more stable) than p orbitals?

10.   What is the Heisenberg Uncertainty Principle? Give an example.