Chem 1063 J-Term 2007. Exam 1
Name_____

(1)(4 points) Define the following

(a) the Pauli Exclusion Principle

(b) the Aufbau principle

(2)(4 points) List and name the four quantum numbers for an electron.

(3)(3 points) List the possible quantum numbers for the following orbitals
(a) 4p

(b) 3p

(c) 5d

(4)(4 points) Write out the ground state electron configuration for the following atoms or ions (do not use the noble gas shortcut)

(a) S

(b) Mg

(c) Ca^{2+}

(d) Cl^{-}

(5)(4 points) Label each of the following as a ground state, an excited state, or an impossible electron configuration

(a) $1s^2 2s^2 2p^5 3s^2 3p^4$

(b) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$

(c) $1s^2 2s^2 2p^6 3s^2 3p^4 4s^3$

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

(6)(2 points) Place the following elements in order from smallest to largest atomic radii.

Zn, Ca, Rb, Al, B

(7)(2 points) Which of the following should have the largest first ionization energy?

O, Mg, S, Tc, or Na

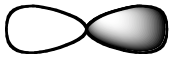
(9)(2 points) Place the following in order from smallest to largest radius.

Li+, He, Be^{2+}

(10) (2 points) Place the following in order of increasing electronegativity

Cl, Rb, Ge

(11) (2 points) What are the possible values of l and m_l for the following orbital?



Extra Credit(4 points) Can an electron ever be trapped motionless in one spot? Explain why or why not