CHEM 200

Recitation 2 Problem set

1. **Give the electron configuration following Bhor's Model for the following elements:**
   a. **Ca**
   b. **Mg**
   c. **B**
   d. **O**
   e. **N**
   f. **Na+**

   Determine their valence electrons

2. Which one of the following sets of quantum numbers is not possible?

	n	l	m_l	m_s
A.	4	3	–2	+1/2
B.	3	0	1	–1/2
C.	3	0	0	+1/2
D.	2	1	1	–1/2
E.	2	0	0	+1/2

3. Which one of the following sets of quantum numbers is not possible?

	n	l	m_l	m_s
A.	4	3	–2	+1/2
B.	3	2	–3	–1/2
C.	3	0	0	+1/2
D.	4	1	1	–1/2
E.	2	0	0	+1/2

4. What is the maximum number of electrons in a atom that can have the following set of quantum numbers?

   $n = 4 \quad l = 3 \quad m_l = -2 \quad m_s = +1/2$

   A. 0 B. 1 C. 2 D. 6 E. 10

5. The number of orbitals in a *d* subshell is

   A. 1 B. 2 C. 3 D. 5 E. 7

6. How many orbitals are allowed in a subshell if the angular momentum quantum number for electrons in that subshell is 3?

   A. 1 B. 3 C. 5 D. 7 E. 9

7. What is the difference in the electron configuration between carbon–14 and carbon–12?

8. Using the periodic table, give the full electron configurations and the orbital diagram for the following elements:
   a) O
   b) Ne
   c) Mg
   d) Si
   e) Cl^-
   f) Sr^{2+}