

# Homework #3

September 21 (to be tested on monthly Test 1 9/29)

From the text, Chapter 3, problems 84, 85, 108, 125, 132, 184, 185, 206-211 (2<sup>nd</sup> edition) or problems 39, 40, 47, 50, 71, 102, 103, 112-117 (1<sup>st</sup> edition).

1. How many of the following electron configurations are allowed?

- (a)  $1s^2 2s^2 2p^7$
- (b)  $1s^2 2s^2 2p^6 2d^1$
- (c)  $[\text{Ne}] 4s^2 4p^4$
- (d)  $[\text{Ar}] 3d^6 4s^2$
- (e)  $1s^2 2s^2 2p^8 3s^2 3p^4$

2. Determine which of the following five electronic states are forbidden:

	$n$	$\ell$	$m$
(1)	2	2	1
(2)	1	0	1
(3)	3	2	0
(4)	4	1	2
(5)	3	2	2

3. (a) In box notation, give the complete ground-state electron configuration for each of the following chemical entities: Cr,  $\text{Ca}^{5+}$ , I,  $\text{He}^{2+}$ ,  $\text{Dy}^{3+}$ .

(b) Give the values of  $n$ ,  $\ell$ , and  $m$  for each orbital in the 5d subshell.