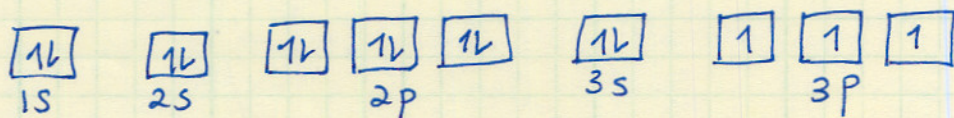
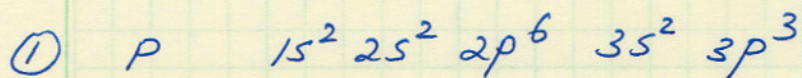
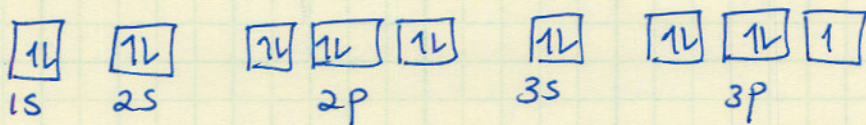
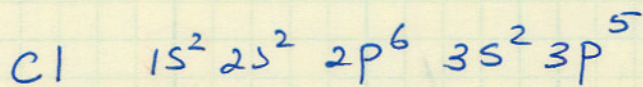


INTRODUCTION TO NATURAL SCIENCE
CHEMISTRY HOMEWORK - WINT. 2007 - WEEK 4

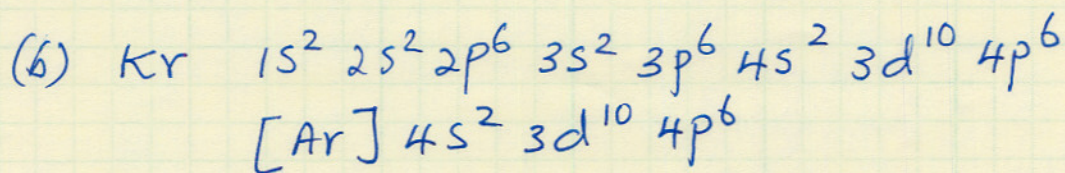
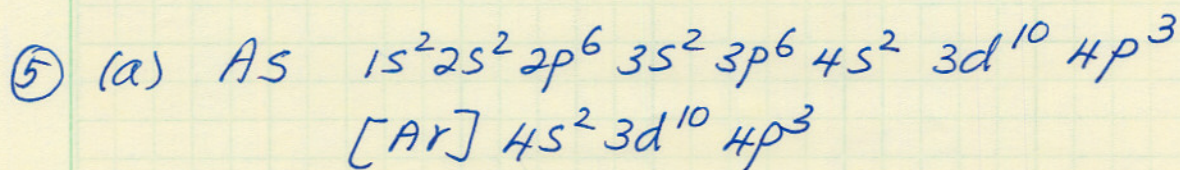
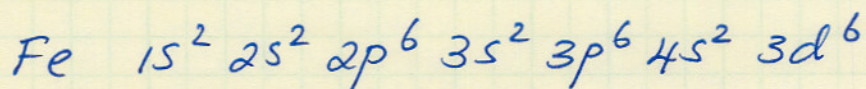
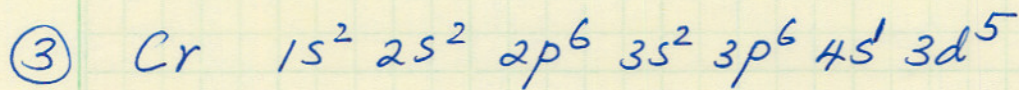
Chapter 8

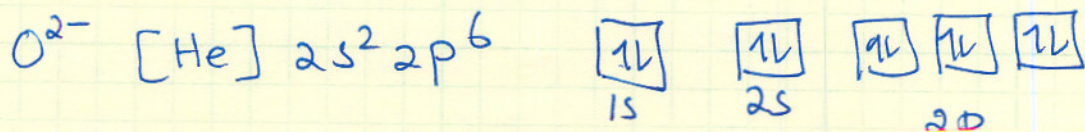
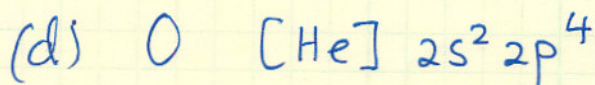
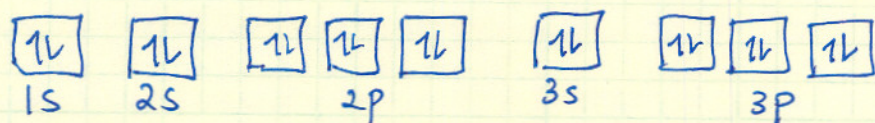
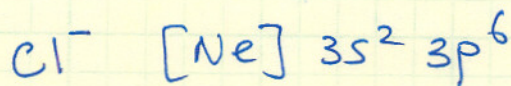
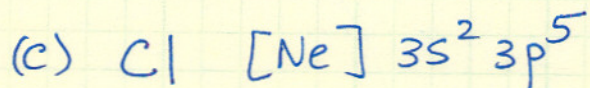
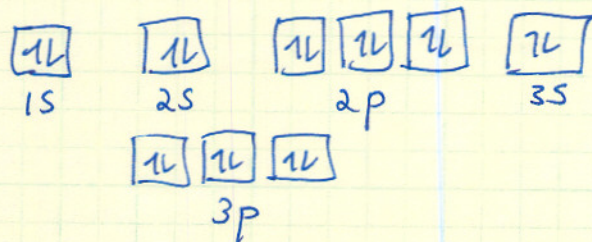
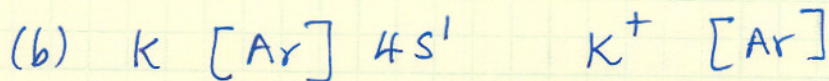
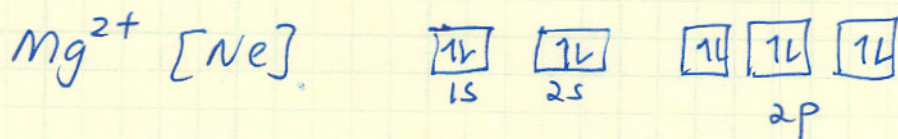
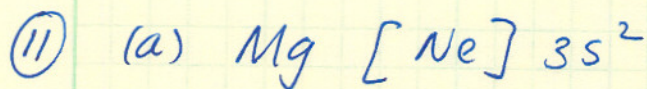
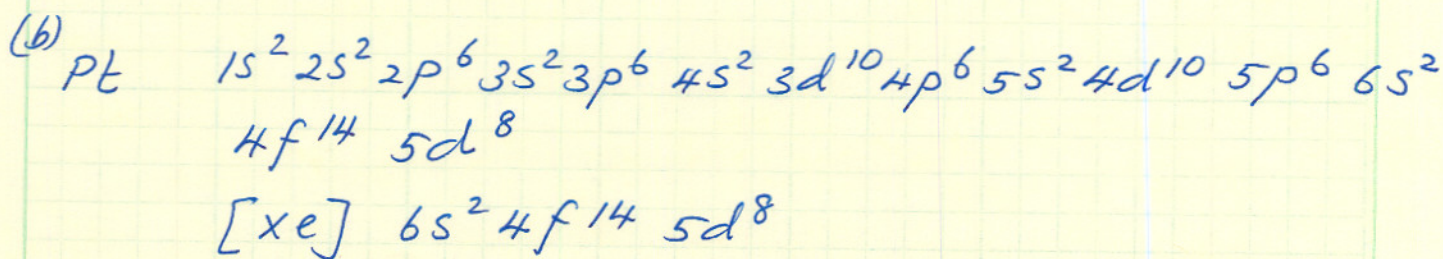
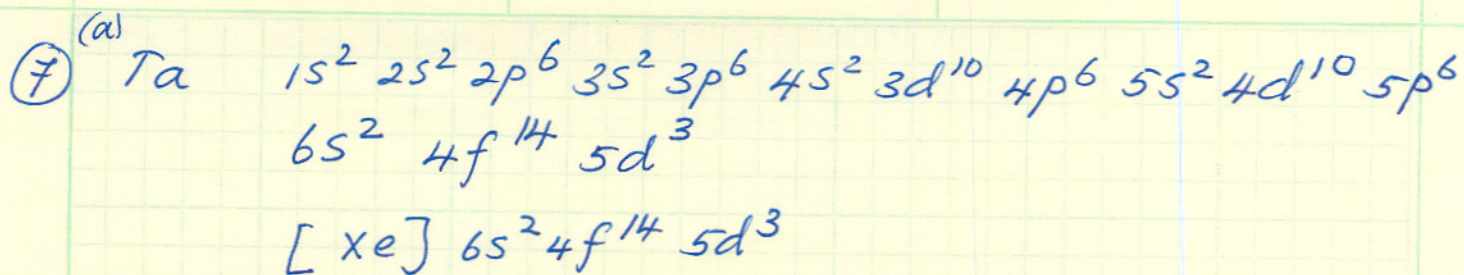


Valence electron configuration is $3s^2 3p^3$. \therefore P is in the 3rd period. Since there are 5 valence electrons P is in the 5A group.



Valence e⁻ config. $3s^2 3p^5$ valence energy level = 3
 \therefore 3rd period. 7 valence electrons \Rightarrow Group 7A.





(17) (a) $m_s \neq 0$ $n=4, l=2, m_l=0, m_s = +\frac{1}{2}$ (or $-\frac{1}{2}$)

(b) $m_l \neq -3$ $n=3, l=1, m_l = \underbrace{-1, 0, +1}_{\text{one of these}}, m_s = -\frac{1}{2}$

(c) $l \neq 3$ $n=3, l=1, m_l = -1, m_s = +\frac{1}{2}$

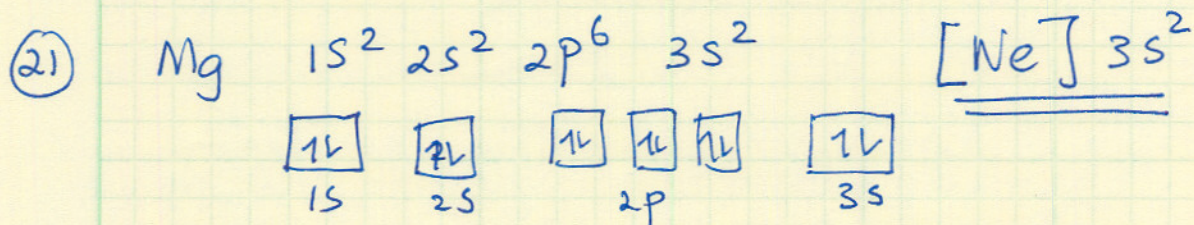
(19) (a) $n=4, l=3$

m_l	m_s	
-3	$\pm \frac{1}{2}$	}
-2	$\pm \frac{1}{2}$	
-1	$\pm \frac{1}{2}$	
0	$\pm \frac{1}{2}$	
+1	$\pm \frac{1}{2}$	
+2	$\pm \frac{1}{2}$	
+3	$\pm \frac{1}{2}$	

14 electrons.

(b) $n=6, l=1, m_l = -1, \therefore m_s = \pm \frac{1}{2} \Rightarrow 2$ electrons

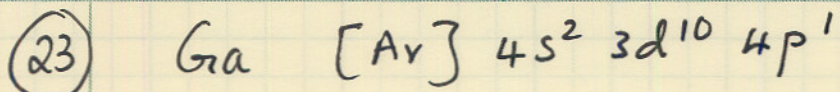
(c) $l \neq 3$ when $n=3$ [$l=0, 1, \dots, (n-1)$]
 \therefore none



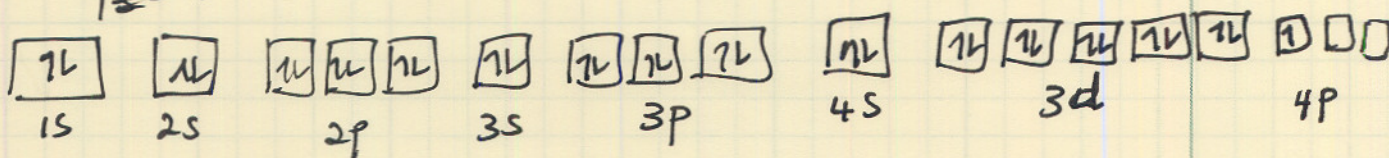
2 electrons in the 3s orbital:

$n=3, l=0, m_l=0, m_s = +\frac{1}{2}$

$n=3, l=0, m_l=0, m_s = -\frac{1}{2}$



Highest energy
~~1s~~



Highest energy electron is the 4p electron

$$n=4 \quad l=1 \quad m_l = -1 \quad m_s = -\frac{1}{2}$$

other possibilities

$$m_l = 0, +1 \quad m_s = \pm \frac{1}{2}$$

any combination is possible.