

Pb # 11.

$$a) L = \sqrt{l(l+1)} \hbar \Rightarrow \frac{(4.83 \times 10^{31})^2}{\hbar^2} = l(l+1)$$

$$l^2 + l = (4.58 \times 10^{65})^2 \Rightarrow \underline{\underline{l \approx 4.58 \times 10^{65}}}$$

$$b) L_l = \sqrt{l(l+1)} \hbar \approx l \hbar \quad L_{l+1} = (l+1) \hbar$$

$$\Delta L = \hbar \quad \text{and} \quad \frac{\Delta L}{L} = \frac{\hbar}{l \hbar} = 2.18 \times 10^{-66}$$

12 (H.c.w)

b # 13 He^+ $n=3 \Rightarrow$ $l=0$ $m_l=0$
 $l=1$ $m_l=1, 0, -1$
 $l=2$ $m_l=2, 1, 0, -1, -2$

$$c) E = -\frac{13.6 (Z)^2}{n} = -\frac{6.04 \text{ eV}}{9}$$

b # 14. Li^{2+}

$n=1$	$l=0$	$m_l=0$	} $E_1 = -13.6(3)^2 = -122.4 \text{ eV}$
$n=2$	$l=0$	$m_l=0$	
	$l=1$	$m_l=1, 0, -1$	} $E_2 = -30.6 \text{ eV}$

16.

Pb # 17. d subshell $d \Rightarrow l=2$ $m_l = -2, 1, 0, -1, -2$
 $L_z = 2\hbar, \hbar, 0, -\hbar, -2\hbar$

b # 18. 4 d $\Rightarrow l=2$ $|\vec{L}| = \sqrt{l(l+1)} \hbar = \sqrt{6} \hbar$