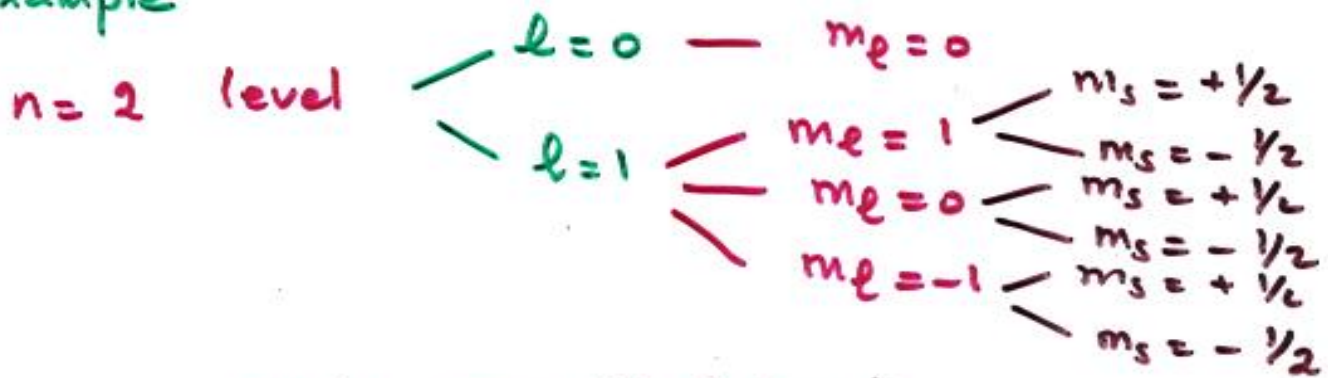


Example



Allowed transitions to $n=2$ level must follow the selection rule $\Delta(m_l + m_s) = 0, \pm 1!!!$

Let us calculate U for $m_l=1$ and $m_s = -\frac{1}{2}$

$$U = \omega_L \hbar \left(1 - 2 \times \frac{1}{2} \right) = 0$$

The energy of the electron will be $E_2!$

If $m_l = -1$ and $m_s = -\frac{1}{2}$

$$U = \hbar \omega_L \left(-1 - 2 \times \frac{1}{2} \right) = -2 \hbar \omega_L$$

The energy of the electron will be

$$E_2 - 2 \hbar \omega_L !$$