

## Two types of quantum questions:

- electron configuration question
- list the quantum number question

Electron configuration means make reference to all electrons in an atom

eg  $_{22}\text{Ti}$        $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$

$_{98}\text{Cf}^{3+}$        $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2 5f^7$

element	n	l	$m_l$	$m_s$	end of config.
S	3	1	0	$+\frac{1}{2}$	$3p^4$
Ta	5	2	-1	$-\frac{1}{2}$	$5d^3$
Pr	4	3	-2	$-\frac{1}{2}$	$4f^3$
Ge	4	1	-1	$+\frac{1}{2}$	$4p^2$
He	1	0	0	$+\frac{1}{2}$	$1s^2$
Md	5	3	3	$-\frac{1}{2}$	$5f^{13}$
Ca	4	0	0	$+\frac{1}{2}$	$4s^2$
Ge	4	1	-1	$+\frac{1}{2}$	$4p^2$
$_{103}\text{Lr}$	6	2	-2	$-\frac{1}{2}$	$6d^1$
Yb	4	3	3	$+\frac{1}{2}$	$4f^{14}$