

## More Quantum Mechanics, solutions

### Problem 1:

(B)

### Problem 2:

(C)

### Problem 3:

(B)  $1s^2, 2s^2, 2p^6, 3s$ , only one electron outside closed shells,  $s = 1/2, l = 0, j = 1/2$ .

### Problem 4:

(B)

### Problem 5:

(D) Dipole selection rules:  $\Delta l = \pm 1$ . Spherically symmetric wave functions have  $l = 0$ .

### Problem 6:

(C) Scaling:  $E_{l'} = \mu' Z^2 e^4 / (2\hbar^2) = E_l(\mu'/\mu)Z^2$ . Here  $\mu' = 1/2, Z = 1$ .