Worksheet 1.5: Solutions

Electron arrangement in atoms – the world within shells

No.	Answer
1	Five subshells: s subshell – 1 orbital, p subshell – 3 orbitals, d subshell – 5 orbitals, f subshell – 7 orbitals, g subshell – 9 orbitals
2	**a** $1s^2\ 2s^2\ 2p^4$ **b** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$ **c** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^5$ **d** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^6$ **e** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^9$
3	**a** $1s^2\ 2s^2\ 2p^6$ **b** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$ **c** $1s^2\ 2s^2\ 2p^6$ **d** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$ **e** $1s^2\ 2s^2\ 2p^6$ **f** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6$
4	**a** boron **b** chlorine **c** oxygen **d** magnesium
5	**a** $1s^2\ 2s^2$ **b** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$ **c** $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6$
6	**a** **i** The elements in the s block have their outermost electrons in an 2 subshell. **ii** These elements have incomplete d subshells (except for the d block elements in group 12 (and 11)). **iii** These elements have their outermost electrons in a p subshell. **b** These elements will have incomplete f subshells