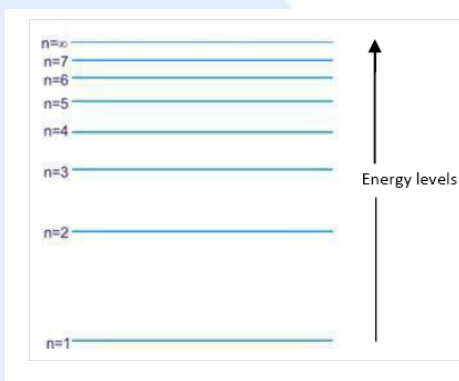


SL & HL Questions on Electron configuration

1. Draw and label (using the letters **a**, **b** and **c**) on the energy level diagram below:

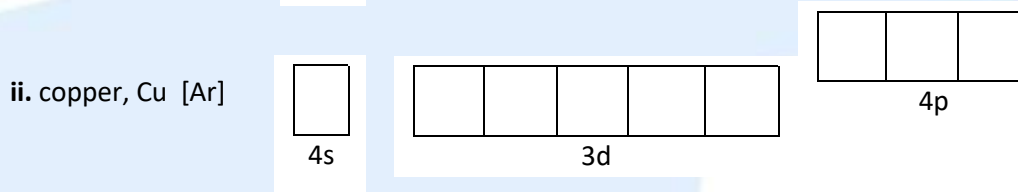
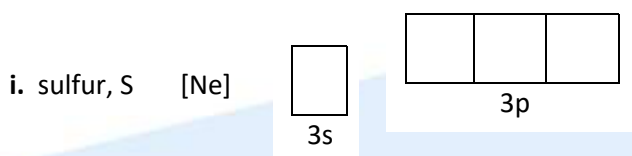
- the electron transition which will give the third line in the visible series of the hydrogen emission spectrum.
- the electron transition which will give the third line in the ultraviolet series of the hydrogen emission spectrum.
- the transition that relates to the ionisation energy of a hydrogen atom.



2. State the full electron configuration of:

- a free nitrogen atom
- an uncombined bromine atom
- $[\text{Ar}]4s^23d^5$ (or $[\text{Ar}]4s^23d^5$).
- Fe^{3+}
- an uncombined chromium atom
- Ge^{2+}

3. Complete the boxes using arrows to represent electrons.



(Note that there is some debate about whether the 4s sub-level is lower or higher in energy than the 3d sub-level. – both are acceptable to the IB)



4. Explain why it is important to label the x, y and z axes when drawing out the shape of a p orbital.
5. Explain why a potassium atom contains an electron in a 4s orbital with no electrons in a 3d orbital whereas a copper(I) ion, Cu^+ has the electronic configuration $[\text{Ar}]3d^{10}$ with no electrons in the 4s orbital.