1. Using the electron in a hydrogen atom as an example, explain the difference between an orbit and an orbital.

2. The electronic structure of carbon is $1s^22s^22p_x^12p_y^1$.
   a) With the help of a simple sketch, explain the shape of the 1s orbital.
   b) How does a 2s orbital differ from a 1s orbital?
   c) Draw a simple sketch to show the shape of a 2p_x orbital.
   d) How does a 2p_y orbital differ from a 2p_x orbital?
   e) Carbon has 4 electrons in the 2-level. With the help of a simple energy diagram, explain why the 2-level electrons don't arrange themselves as $2s^12p_x^12p_y^12p_z^1$. 

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