



Chapter 4: Carbon and the Molecular Diversity of Life  
Campbell, Biology, 7<sup>th</sup> Edition

*Answer each of the following questions on separate paper. All answers may be typed or hand-written... but do your OWN work.*

1. What is organic chemistry? Distinguish between organic and inorganic molecules and draw an example of each.
2. Explain the experiments done by Stanley Miller and how they helped change the science of organic chemistry.
3. What is the major factor that determines how an atom will bond with other atoms?
4. What is so special about the bonding of carbon? What does this type of tetravalent bonding allow?
5. What is another characteristic property of a molecule that determines its function?
6. What is a hydrocarbon? What are two major examples of hydrocarbons? Why don't these substances mix with water?
7. What is an isomer? List and distinguish between the three major types of isomers.
8. Explain how the enantiomers L-Dopa and D-Dopa have been pharmacologically important.
9. What is a functional group? Explain how functional groups are related to the properties of a molecule.
10. What are the six main functional groups found in living organisms? What is a major similarity between these functional groups?
11. Draw examples of molecules with each of the six functional groups (six different molecules showing each of the functional groups).