

CHAPTER 3: Biological Molecules

BI 102 – Study Questions

Questions from the Book:

- 1) List the four principle types of biomolecules, and give an example of each.
- 2) Describe and compare dehydration synthesis and hydrolysis. Give an example of a substance formed by each chemical reaction, and describe the specific reaction in each instance.
- 3) Distinguish among the following: monosaccharide, disaccharide, and polysaccharide. Give two examples of each and their function.
- 4) Describe the synthesis of a protein from amino acids. In addition, describe primary, secondary, tertiary, and quaternary structures of a protein.
- 5) Which kinds of bonds or bridges between keratin molecules are altered when hair is (a) wet and allowed to dry on curlers and (b) given a permanent wave?

Additional Questions:

- 6) Define organic compound. Name the type of chemical bond that predominates in the backbone of such a compound.
- 7) What role do proteins play in the cells and tissues of living organisms?
- 8) What is meant by a functional group? What is an example of a functional group that is polar? Non-polar? Acidic? Basic?
- 9) Why are fats solid at room temperature and oils are liquid at room temperature?

Applying Your Knowledge:

- 10) Plants store most of their energy in carbohydrates, especially starch. Animals store some energy in glycogen (animal starch) but store most of their energy in lipids, especially fat. Why is using fat as a storage molecule important in animals but not plants? (Think about the difference in lifestyle between a plant and an animal...)
- 11) Grasses can be digested in cows, but not in people. A cow's four-chambered stomach houses populations of certain microorganisms that are not normal inhabitants of the human stomach. What kind of chemical reactions do you think the microorganisms carry out? What do you think might happen to a cow that is undergoing treatment with an antibiotic that killed the microorganisms?