**Chapter 5 Reading Guide**

**-The Structure and Function of Large Biological Molecules-**

***Sections 1 and 2***

1. The large molecules of all living things fall into four main classes. Name them.
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   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Explain the terms polymer and monomer.

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1. Explain the following reactions in relation to monomers and polymers.
   1. Dehydration Reaction- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Hydrolysis Reaction- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. The root words of hydrolysis will be used many times to form other words you will learn this year. What does each root word mean?
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   2. Lysis- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Polymers are assembled and broken down in two types of reactions: dehydration synthesis and hydrolysis. What type of reaction is this? Is glucose (C6H12O6) a monomer or a polymer?

C6H12O6 = C6H12O6 → C12H22O11

1. Most monosaccharides are some multiple of CH2O. For example, ribose is a 5-Carbon sugar with the formula C5H10O5. It is a pentose sugar (from the root “penta” meaning five). What is the formula of a hexose sugar?

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1. Sugars contain two main functional groups. What are they?

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1. What is a glycosidic linkage?

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1. There are two main types of polysaccharides. Name them and briefly describe their function.
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   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Why can your body not digest cellulose?

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1. What is chitin used for?

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***Section 3***

1. Lipids include fats, waxes, oils, phospholipids, and steroids. What characteristic do all lipids share?

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1. What are the monomers of fats?

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1. Draw a fatty acid chain that is 8 carbons long and is unsaturated. Describe what makes it unsaturated, and how it could be made saturated.
2. What is the consistency of saturated fats and unsaturated fats at room temperature?

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1. Why are certain fats a liquid at room temperature?

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1. Cell membranes are made up of a “phospholipid bilayer.” Sketch what this looks like, labeling the hydrophilic heads, hydrophobic tails, and location of water.
2. What are some examples of steroids?

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***Section 4***

1. Describe the job of a catalyst.

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1. What is a polypeptide?

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1. Proteins have many different functions. Using the table in your book, list the 8 types of proteins and their functions.
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   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Amino acids share a basic structure. Sketch this structure in the space below, labeling the amino group, carboxyl group and side chain/R group.
3. What is represented by the R group? How many R groups are there?

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1. What is a peptide bond?

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1. What are the four levels of protein structure?

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1. Explain the term denaturation. What are some ways that a protein can become denatured?

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1. Describe the role of chaperonins.

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***Section 5***

1. In three words, summarize the flow of genetic information.

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1. Nucleotides have three main components, what are they?

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1. There are 5 nitrogen bases, which four are found in DNA?

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1. Which four are found in RNA?

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1. What is the shape of the DNA molecule called?

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1. Why are the strands of DNA said to be antiparallel?

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1. What molecules make up the backbone of the DNA ladder?

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1. What molecules make up the rungs of the DNA ladder?

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1. What type of bonds hold the DNA strands together?

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1. In a DNA double helix, a region along one DNA strand has this sequence of nitrogenous bases. Write the complementary strand, indicating the 5’ and 3’ ends of the new strand.

5’- T A G G C C T - 3’