Name _____ Date _____

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AP Biology: The Structure and Function of Macromolecules
Reading Guide Chapter 5

1. Describe the purpose of the following two reactions **and what happens with water** in each.
   a. Condensation or dehydration synthesis reaction

   b. Hydrolysis

Complete the table below:

Organic Molecule	**Structure**	**Function**	**Picture/ Examples**
Carbohydrate	Monomer –		
	Polymer -		
Lipid	Steroid–		
	Fat -		
Protein	Monomer –		
	Polymer -		
Nucleic Acid	Monomer –		
	Polymer -		

*For the next questions the answer is either: **carbohydrate, lipid, nucleic acid**, or **protein**.*

2. Main component of cell membranes
3. Functions for energy storage and structural support
4. Consists of amino acids

5. Consists of nucleotides
6. Composed of monosaccharides
7. Has four levels of structure; primary, secondary, tertiary, and quaternary
8. Can be either DNA or RNA
9. Non polar molecules

10. Functional groups can modify the properties of organic molecules. In the following table, indicate whether each functional group is polar or nonpolar and hydrophobic or hydrophilic. Which of these functional groups are found in proteins and lipids?

Functional group	Polar or nonpolar	Hydrophobic or hydrophilic	Found in carbs (indicate where)	Found in lipids (indicate where)	Found in proteins (indicate where)	Found in nucleic acids (indicate where)
—OH						
—CO						
—COOH						
—NH_2						
—SH						
—PO_4						

11. Closely related macromolecules often have many characteristics in common. For example, they share many of the same chemical elements and functional groups. Therefore, to separate or distinguish closely related macromolecules, you need to determine how they differ and then target or label that difference.

    a. What makes RNA different from DNA?

    b. If you wanted to use a radioactive or fluorescent tag to label only the RNA in a cell and not the DNA, what compound(s) could you label that is/are specific for RNA?

    c. If you wanted to label only the DNA, what compound(s) could you label?