**HONORS BIOLOGY 2021-2022/ZEDALIS/THE BISHOP’S SCHOOL**

**STUDY GUIDE: UNIT 1 ASSESSMENT (BIOCHEMISTRY)**

PART 1: Multiple Choice (15 questions, 2 points each)

* pH scale and H+ concentration; acids and bases
* atomic structure; atomic numbers vs. atomic mass; position of protons, neutrons, and electrons; filling electron shells/orbits; significance of valence electrons
* structure of a water molecule; electronegativity; polar covalent bond formation; hydrogen bonds; unique properties, including cohesion, adhesion, capillary action, high specific heat, surface tension, solvent
* organic functional groups and their properties. For example, why does the carboxyl group (COOH) act as a weak acid?
* Monomers vs. polymers; dehydration synthesis vs. hydrolysis; glycosidic and ester linkages, peptide bonds
* How does “complementarity of structure and function” related to molecules and biomolecules?
* Four groups of macromolecules: carbohydrates, lipids (and phospholipids), proteins, and nucleic acids. What are the monomers of each; what functional groups do their monomers have; what are the functions of each group? Which SPONCH elements are associated with each?
* Saturated vs. unsaturated fats and C-C double bonds
* Polar vs. nonpolar amino acids
* How do pH and temperature affect a protein’s tertiary structure. (This is important because most enzymes, that are catalysts for biological reactions, are tertiary proteins.)

PART 2: Quantitative Skill (5 points)

* Be familiar with the SPONCH elements and which macromolecules contain each one

PART 3: Free Response Questions (11 points)

* Properties of water resulting from water’s unique molecule structure and ability to form polar covalent bonds and hydrogen bonds
* Structure of amino acids and levels of protein structure

PART 4: Name That Molecule! (9 points)

* Be able to recognize components/functional groups of carbohydrates, lipids and phospholipids, proteins, and nucleic acids