

Biology and Chemistry Quiz Review Sheet

The Biology and Chemistry Quiz will be on during the first 20 minutes of lecture on February 4th. The quiz is worth 25 points. In addition, it will include material from the first week of class. The quiz may contain questions in multiple-choice, fill-in, and short answer questions. Background information can be found in the online supplements to your text or any general biology text. You will need a Scantron 815E Form for this quiz.

1. **Chemical bonds:** Be able to define non-polar, covalent, polar covalent, ionic, and hydrogen bonds and give specific chemical examples of each bond type. Know the relative strength of the bond types when compared to each other. Be able to define the terms cation, anion, and electronegativity.
2. **Water:** Understand all described physical/chemical characteristics of water and compare and contrast the properties of hydrophilic and hydrophobic molecules. **Monomer and Polymer:** Be able to define these terms.
3. **Hydrolysis and Condensation (Dehydration synthesis) Reactions:** Define these terms.
4. **pH, acids, and bases:** Be able to define oxidation and reduction reactions and be able to give a specific example.
5. **Polysaccharides and the glycosidic bond:** Explain how polysaccharides are produced through the formation of glycosidic bonds. Be able to draw a specific molecular example showing the formation of the glycosidic bond and the removal of water.
6. **Phospholipids:** Know the chemical properties of the phospholipid that make it essential for membrane formation and function.
7. **Amino acids, Proteins, and the Peptide Bond:** Understand how proteins are produced from amino acids through the formation of peptide bonds. Be able to draw specific molecular example showing the formation of the peptide bond and loss of water.
9. **Protein Structure:** Be able to define and differentiate primary, secondary, tertiary, and quaternary protein structures. Understand how acids, bases, and temperature can alter secondary, tertiary, and quaternary structures and which chemical bond is specifically disrupted.
10. **Enzymes:** Be able to describe the important properties of enzymes.
11. **Nucleotides and High Energy Bonds:** Be able to define the structural parts of a nucleotide and draw the molecular structure of ATP. Be able to define a high-energy bond and understand its significance in cellular energy.
12. **Nucleic Acids and Complementary Base Pairing:** Know which purines and pyrimidines contribute to the formation of DNA and RNA. Know the complementary base pairing for DNA nucleotides. Know what type of chemical bond contributes to complementary base pairing and the number of individual bonds formed for complementary base pairs. Understand how changes in temperature would affect the stability of hydrogen bonds in complementary base pairing.
13. **Lipids:** Glycerol, saturated, and unsaturated fatty acids.
14. **Functional groups:** Be able to draw the following functional groups: aldehyde, amino, carboxyl, ester, ether, hydroxyl, phosphate, and phosphodiester.
15. Review cellular respiration.