Name: Date: Block:

Objective 1: General Chemistry Review:

1. Identify subatomic particles and describe how they are arranged in atoms
2. Describe the difference between ions and atoms and the importance of ions in biological processes
3. Compare the types of bonding between atoms to form molecules

**General Chemistry:**

1. Identify the 3 subatomic particles, their charges and their locations?



1. Is a with a

 charge located on the .

1. Is a with a

 charge, located in the

1. Is a with a

 charge, located in the .

1. **Atomic number** of an element tells us the number of and the number of in that atom.
2. The **atomic mass** identifies the subatomic particles found in the ***nucleus***, those subatomic particles are and .
3. These electrons are found in the outer most orbital of an atom and are the reason why atoms bond together. These electrons are .
4. A is when electrons are **shared** between two or more atoms.
5. A is when electrons are **transferred** between two or more atoms.
	* In this type of bond, atoms often **lose** their electrons.
6. When an atom **loses** an electron, that atom becomes , when an atom **gains** an electron, that atom becomes . *For example,* when Sodium (Na) give its valance electron to Chlorine (Cl) to form salt (NaCl).
7. The primary factor that determines of a bond between atoms is *the difference in electrons to each atom*.

Objective 2: Properties of Water and pH

1. Explain the fundamental principles of the pH scale and the consequences of having the different concentrations of hydrogen and hydroxide ions
2. Define and explain the unique properties of water that are essential to living organisms

**Properties of Water & pH:**

1. What is the shape of water?
2. Water is because the atom is slightly and the atom is slightly .
3.  In a water molecule, the bond between the **oxygen** atom and the **hydrogen** atom is called a . The bond between ***two*** water molecules is called a .
4. The reason that water has all of its unique properties is because of its .
5. The property of water that explains why certain things can **dissolve** easily in water is that water is a molecule.
6. It is important that water is ***less dense*** as a solid, is so floats and it can .
7. When **two** water molecules are attracted to each other, it is called , when water molecules are attracted to other things and substances it is called and is the reason water is “sticky.”
8. An invisible layer that forms by the properties of adhesion and cohesion is called , and is the reason small bugs can walk on water.
9. The reason why water takes a long time to boil on the stove or for a pool to heat up in the summer time is because water has a
10. What does the pH scale measure?
11. If is solution has a high amount of **hydroxide ions (OH-)** the solution is said to be what? The range is:
12. If the solution has a high amount of **hydrogen ions (H+)** the solution is said to be what? The range is:
13. This number is said to be **neutral** on the pH scale?

Objective 3: Organic Compounds and macromolecules

1. Explain the difference between organic and inorganic compounds
2. Describe the general structure and function(s), including common functional groups, of monosaccharides, disaccharides, polysaccharides, carbohydrates, fatty acids, glycerol, glycerides, lipids, amino acids, dipeptides, polypeptides, proteins, and nucleic acids

**Macromolecules:**

1. What atom represents the word **“organic?”**
2. Of these example, which formula is an organic compound? *Circle one*
	1. KOH b. H2O c. C6H12O6 d. HCl
3. The basic building blocks of macromolecules are .
4. Amino acids can sometimes be difficult to identify, to best identify them look for this particular atom /functional group.
5. When we eat food, the macromolecules that is used for short-term storage is called , as the macromolecule used for ***long-term*** energy storage is .

**Identify the structure below. Write which macromolecule it belongs to, its monomer, and examples of each.**

****

7. **Macromolecule:**

 **Monomer:**

 **Examples:**

6. **Macromolecule:**

 **Monomer:**

 **Examples:**



8. **Macromolecule:**

 **Monomer:**

 **Examples:**

9. **Macromolecule:**

 **Monomer:**

 **Examples:**

10. The function of **Carbohydrates** is to give organisms (us) .

11. The function of **Proteins** are required for , , and of the body’s tissues and organs.

12. The function of **Lipids** is to , , and **store energy.**

13. The function of **Nucleic Acids** is to carry our

14. Sugars usually end in **–ose** and contain the same chemical formula, which is:

15. How many **amino acids** can be found in nature, that are used to code for a wide variety of proteins?

Objective 4: Enzymes

* 1. Describe the function of enzymes, including how enzyme-substrate specificity works, in biochemical reactions

**Enzymes:**

1. The **purpose** of enzymes are to act as to speed up the chemical reactions in our bodies, such as digestion, metabolism, breathing and growing.
2. Enzymes speed up chemical reactions be decreasing .
3. If you are lact**ose** intolerant, it is best to add to your milk so that the enzyme can break down the lactose sugar molecules.
4. Enzymes are very to the chemical reactions that it catalyzes. Meaning it binds to a particular substrate like *lock and key* to break substrates apart.
5. An enzymes name typically ends in this suffix:
6. The word means it is a substance that helps speed up chemical reactions.
7. Two things affect the rate of enzyme activity.
	1. The : when temperatures increase the rate of enzyme activity increases, if the temperature is too high, enzymes will and break apart.
	2. The : when pH increases or decreases, it changes the enzymes , making the substrate not fit into the enzymes active site.



1. Based on the graph above, which of the following statements **best** describes an effect of **pH** on the functioning of salivary amylase?
	* 1. Salivary amylase functions most effectively at a pH of about 4.
		2. Salivary amylase functions most effectively at a pH of about 7.
		3. Salivary amylase cannot break down starch into maltose at pH values less than 7.
		4. Salivary amylase breaks down protein instead of starch at pH values greater than 9.