Name: _____

Period:_____

Unit 2: Chemistry

Test Review

1. List the three states of matter.

2. Describe an atom in terms of its nucleus, valence,shell, electrons, protons, and neutrons.

3. Define the term element and identify the four major elements in the body.

4. Define the following terms:
   a. compound:

   b. molecule:

5. Define the following terms:
   a. ion:

   b. cation:

   c. anion:

6. Describe the characteristics of the following types of bonds:
   a. ionic:

   b. covalent:

   c. hydrogen:

7. Define pH.

8. Given the pH of a solution, categorize it as acidic, basic, or neutral.
   a. 7.0
   b. 14.0
   c. 5.5
   d. 1.0
   e. 7.35

9. What is the pH of blood? _____ Is this acidic, basic or neutral?

10. Describe the properties of water that make it so valuable to the human body.

11. Define the following terms:
    a. organic:

    b. inorganic:

12. Draw the structures and identify the functions of carbohydrates, proteins, lipids, and nucleic acids.
    a. Carbohydrates b. proteins c. lipids

    Function: Function: Function:

13. Describe the ATP → ADP + Pi + ENERGY conversion which occurs when the body needs energy and when the body stores energy.

Unit 2: Chemistry

Test Review - KEY

1. List the three states of matter.
Matter may be solid, liquid, or gas.

2. Describe an atom in terms of its nucleus, shell, electrons, protons, and neutrons.
Atoms consist of a nucleus and a surrounding electron shell. The nucleus contains both protons (positive charge) and neutrons (neutral charge). The electron shell contains electrons (negative charge).

3. Define the term element and identify the four major elements in the body.
Elements are the building blocks of matter. They cannot be decomposed into simpler substances by ordinary chemical reactions. An element is a quantity of matter composed of atoms of the same type.
The four major elements in the body are: carbon, hydrogen, oxygen, and nitrogen.

4. Define the following terms:
   a. compound: A substance composed of atoms of two or more different elements that are chemically combined.
   b. molecule: The combination of two or more atoms held together by covalent bonds.

5. Define the following terms:
   a. ion: charged particle

   b. cation: When an atom loses an electron or electrons to another atom, it will have an overall positive charge.

   c. anion: When an atom gains an electron or electrons from another atom. it will have an overall negative charge.

6. Describe the characteristics of the following types of bonds:
   a. ionic: An attraction between atoms where one atom loses and another atom gains an electron. The bond is formed by the attraction of two oppositely charged ions.

   b. covalent: The sharing of electron pairs by two or more atoms.

   c. hydrogen: The bonding of two other atoms (usually oxygen or nitrogen) covalently bound to a hydrogen atom.

7. Define pH. pH is the term used to describe the degree of how acidic or basic a solution is

8. Given the pH of a solution, categorize it as acidic, basic, or neutral.
   a. 7.0 neutral
   b. 14.0 basic
   c. 5.5 acidic
   d. 1.0 acidic
   e. 7.35 basic

9. What is the pH of blood? **7.35-7.45** Is this acidic, basic or neutral? basic

10. Describe the properties of water that make it so valuable to the human body.
   A. Water is a universal solvent providing an excellent suspension medium for the transport of nutrients and wastes.
   B. Water serves as a transport medium and facilitates movement of molecules throughout the body (circulation).
   C. Water serves as a lubricant in various regions of the body and is a major component of mucous, saliva, bile, amniotic fluid, synovial fluid, and serous fluid.
   D. Water absorbs and releases heat very slowly which makes it vital to regulate the body's temperature.
   E Water is needed in the process of digestion and the breaking apart of larger molecules.
   F. Water is important in removing waste products from the body.

11. Define the following terms:
   a. organic: Contain both carbon and hydrogen atoms.

   b. inorganic: Generally lack carbon atoms. If the compound contains carbon, it does not contain carbon and hydrogen.

12. Draw the structures and identify the functions of carbohydrates, proteins, lipids, and nucleic acids.
   a. Carbohydrates b. proteins c. lipids

Carbohydrate Functions:
a. Provide structural units in DNA and part of the cell membrane structure.

b. Provide the major energy source for the body.
c. Each gram of carbohydrate provides 4.5 Kcalories.
d. Only energy source for brain and nervous system function.
e. Blood sugar is known as glucose.

Protein Functions:
a. Proteins are responsible for much of the structure of body tissues including cell membranes, collagen, and elastin.
b. Proteins may form enzymes which act as catalysts in chemical reactions to speed up the reaction.
c. Proteins function as antibodies to help the body fight infection.
d. Proteins may form hormones which act as chemical regulators for growth and development.
e. Proteins in the blood help to regulate the osmotic pressure, function as antibodies, and assist in blood clotting.
f. Proteins may function as storage molecules (ferritin) or transport molecules (hemoglobin).
g. Proteins may function as contractile proteins such as actin and myosin.
h. Proteins may function as neurotransmitters by helping the nerves communicate with other nerves or muscle fibers.

Lipid Functions:
a. The most highly concentrated source of energy providing the body with 9.2 Kcalories per gram.
b. Provides the body with its second source of energy.

13. Describe the ATP $\rightarrow$ ADP + Pi + ENERGY conversion which occurs when the body needs energy and when the body stores energy.

Structure of ATP
1. An adenosine unit composed of adenine and a five carbon sugar (ribose).
2. Three phosphate groups.
   Energy is released when the terminal phosphate group is removed by the addition of a water molecule (hydrolysis).

The reaction for ATP synthesis and destruction is a reversible reaction.
ATP→ ADP + P + energy