Name: _____ Period: _____ Date: _____

Chemistry of Life Assignment – Teacher Edition

I. Multiple Choice – Select the best answer.

1. An element is defined as _____.
    a) a substance that cannot be broken into a simpler form
    b) anything that has mass and takes up space
    c) a substance that cannot be dissolved in a solvent
    d) a substance that can be dissolved in a solvent

2. The three subatomic particles are called _____.
    a) proton, electron, isotope
    b) proton, electron, element
    c) proton, electron, neutron
    d) proton, electron, orbital

3. Which of the following best describes the difference between a cation and an anion?
    a) Anions are positively charged and cations are negatively charged.
    b) Cations gain electrons and anions lose electrons.
    c) Cations are positively charged and anions are negatively charged.
    d) Cations are gaseous and anions are metallic.

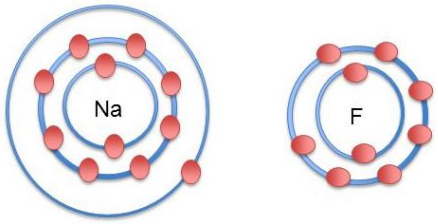
4. A(n) _____ is formed when two atoms share electrons, such as with hydrogen and oxygen in water.
    a) element
    b) covalent bond
    c) ionic bond
    d) hydrogen bond

5. The main elements found in living things are.
    a) Carbon, hydrogen and oxygen
    b) Carbon, sulfur and chlorine
    c) Carbon, oxygen and potassium
    d) Carbon, nitrogen and sodium

Name: _____ Period: _____ Date: _____

Chemistry of Life Assignment – Teacher Edition

II. Use the diagram below of sodium (Na) and fluorine (F) to answer the questions that follow.



a) Predict the type of ion formed by each atom

_____

b) Identify the type of bonding these two atoms will undergo _____

c) Name the compound that will be formed as a result of these two atoms bonding.

_____

d) What type of ion is sodium referred to in biology? _____

e) Where is sodium used in the body? _____

_____

III. How does the formation of ionic bonds between atoms differ from the formation of covalent bonds?

_____

_____

IV. Give an example of where each of the following types of bonding is seen

a) Hydrogen bonding _____

b) Covalent bonding _____

c) Ionic bonding _____

V. Give one difference between covalent bonds and hydrogen bonds

_____

_____

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Answers

I. Multiple Choice – Select the best answer.

1. The element is defined as _____.
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   b) anything that has mass and takes up space
   c) a substance that cannot be dissolved in a solvent
   d) a substance that can be dissolved in a solvent

2. The three subatomic particles are _____.
   a) proton, electron, isotope
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3. Which of the following best describes the difference between a cation and an anion?
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4. A(n) _____ is formed when two atoms share electrons, such as with hydrogen and oxygen in water.
   a) element
   b) covalent bond
   c) ionic bond
   d) hydrogen bond

5. The main elements found in living things are.
   a) Carbon, hydrogen and oxygen
   b) Carbon, sulfur and chlorine
   c) Carbon, oxygen and potassium
   d) Carbon, nitrogen and sodium

Name: _____ Period: _____ Date: _____

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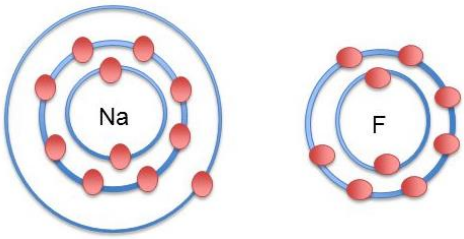
II. Use the diagram below of sodium (Na) and fluorine (F) to answer the questions that follow.



a) Predict the type of ion formed by each atom

Sodium will form a cation/positive ion while fluorine will form an anion/negative ion

b) Identify the type of bonding these two atoms will undergo Ionic bonding

c) Name the compound that will be formed as a result of these two atoms bonding.

Sodium fluoride

d) What type of ion is sodium referred to in biology? An electrolyte

e) Where is sodium used in the body? Muscle contraction, nervous system, water balance

III. How does the formation of ionic bonds between atoms differ from the formation of covalent bonds?

An ionic bond forms between ions of opposite charges by loss and gain of electrons, whereas, a covalent bond forms between when the electrons of two or more atoms are shared.

IV. Give an example of where each of the following types of bonding is seen

a) Hydrogen bonding DNA double helix – joining the two strands together

b) Covalent bonding water molecules, the carbon sugar or phosphate backbone in DNA

c) Ionic bonding ionic compounds such as sodium chloride

V. Give one difference between covalent bonds and hydrogen bonds

Covalent bonds are strong, whereas hydrogen bonds are weak

Hydrogen bonds are the result of electrostatic attraction between a proton in one molecule and the electronegativity of another atom, whereas covalent bonds result from electrons being shared between two atoms.