SELF-ASSESSMENT - MODULE B – LESSON 3: CHEMICAL BONDING

**Are the following statements True or False?**

A. All elements are neutral T or F

B. When atoms bond, they always become stable? T or F

C. Compounds are stable, only when their outside shells are filled T or F

D. A polyatomic ion will always have a positive or negative charge T or F

**Fill in the blanks:**

A. Sharing of electrons will form **MOLECULAR** compounds.

B. Sharing of electrons forms **COVALENT** bonds.

C. Equal sharing of electrons forms **NON-POLAR** bonds.

D. Exchanging electrons forms **IONIC** compounds and **IONIC** bonds.

E. A non-metal joined to a non-metal will usually form a **COVALENT** bond.

F. A metal and a non-metal will usually join to form a **IONIC** bond.

G. A cation has a **POSITIVE** charge and an anion has a **NEGATIVE** charge.

H. Electrolytes are typically produced when a **IONIC** compound is placed in a liquid such as water.

I. What is the purpose of electrolytes in general? **THESE IONS WILL CONDUCT ELECTRIC CURRENT WHEN IN THE LIQUID STATE OR IN AN AQUEOUS SOLUTION**

J. Hyperkalemia is **AN ELEVATED POTASSIUM LEVEL IN THE BLOODSTREAM**.

K. The normal value for sodium is **135 to 145 mEq/L**.

L. Name one polyatomic ion
   i. **$NO_3^-$ NITRATE ION**
   ii. **$OH^-$ HYDROXIDE ION**
   iii. **$HCO_3^-$ BICARBONATE ION**
   iv. **$NH_4^+$ AMMONIUM ION**

M. Define density. **MASS PER UNIT VOLUME**

**Will the following most likely form a covalent or ionic bond?**

| | | | | |
|---|---|---|---|---|
| A. | Carbon (non-metal) | + | Nitrogen (non-metal) | **COVALENT** |
| B. | Lithium (metal) | + | Nitrogen (non-metal) | **IONIC** |
| C. | Magnesium (metal) | + | Chlorine (non-metal) | **IONIC** |
| D. | Sulfur (non-metal) | + | Fluorine (non-metal) | **COVALENT** |

E. Hydrogen (nonmetal) + Oxygen (nonmetal) **COVALENT**

F. Sodium (metal) + Chlorine (nonmetal) **IONIC**

**Answer the following questions.**

1. What is the major "intracellular" cation? **POTASSIUM**
2. Name the major "extracellular" cation. **SODIUM** anion **CHLORIDE**
3. What is the term for a high sodium level in the blood? **HYPERNATREMIA**
4. On the periodic table, do the elements in columns 1 - 2 want to accept or donate electrons?
   A. **DONATE**
   B. Are they usually cations or anions? **CATIONS**
   C. Are they metals or non- metals? **METALS**
   D. Do they have a positive or a negative charge? **POSITIVE**
5. Name two types of bonding.
   A. **COVALENT**
   B. **IONIC**
6. What kind of bond has elements sharing electrons equally? **NON-POLAR COVALENT**
7. What kind of bonds can *possibly* form electrolytes? **IONIC** or **POLYATOMIC**
8. What is the objective of an element when it bonds? **FILL THE OUTERMOST ELECTRON SHELL**
   A. How many electrons is it seeking in the outer shell? **EIGHT (EXCEPT HYDROGEN AND HELIUM WHICH IS TWO)**
   B. What kind of charge does the substance strive for? **NON-NEUTRAL**
9. Name two types of compounds:
   A. **MOLECULAR**
   B. **IONIC OR POLYATOMIC**
   C. Which one is more tightly bound? **COVALENT**
   D. Which dissociates into ions (electrolytes) in solution? **IONIC COMPOUNDS**

**Given the following lab values, indicate which ones are abnormal and give the correct term for this condition**

A. **$Na^+$ 155 mEq/L** **ELEVATED - HYPERNATREMIA**
B. **$K^+$ 2.9 mEq/L** **DECREASED - HYPOKALEMIA**

C. **$Cl^-$ 85 mEq/L** **NORMAL - NORMOCHLOREMIA**

D. **$Ca^{+2}$ 6.0 mEq/L** **DECREASED – HYPOCALCEMIA**