1. Write a ***brief description*** of each of the following levels of biological organization.

1. Biosphere
2. Ecosystem
3. Community
4. Population
5. Organism
6. Organs and organ systems
7. Tissues
8. Cells organelles
9. Molecules

2. Give an ***example*** of how systems biology may impact medical practice or environmental policy making.

3. ***Describe*** the pathway from DNA nucleotides to protein.

4. What is a commonly used criterion for placing plants, fungi and animals in separate kingdoms?

5. ***Describe in your own word’s*** Darwin’s theory of natural selection as the mechanism of evolutionary adaptation and the origin of new species.

6. ***Compare*** hypotheses and theories.

7. ***Compare*** science and technology.

8. ***Complete*** this statement:

The difference between the mass number and the atomic number of an atom is the number of *\_\_\_A\_\_\_*. An atom of phosphorus, $\frac{31}{15}$P, contains \_\_\_*B*\_\_\_ protons, *\_\_\_C\_\_\_* electron, and *\_\_\_D\_\_\_* neutrons. The atomic mass of phosphorus is approximately *\_\_\_E\_\_\_*.

9. Identify the four most common elements of living matter. What are the valences of these elements?

10. Define the following:

1. Polar
2. Nonpolar
3. Covalent
4. Ionic
5. van der Waals forces
6. hydrogen bonds
7. electronegativity

11. **Explain** whether the following molecules contain nonpolar or polar covalent bonds. *(Hint: N and O both have high electro negativities.)*

1. Nitrogen molecule c) Methane
2. Ammonia d) formaldehyde

12. Calcium and chlorine can combine to form the salt calcium chloride. Based on the number of electrons in their valence shells and their bonding capacities, ***what*** would be the molecular formula for this salt? ***Which*** atom becomes the cation?

13. ***What*** is the molecular formula for water? Two water molecules form ***what type*** of covalent bond?

14. ***Look*** at a diagram of a water molecule. ***Explain*** why its shape roughly resemble a V? ***Which*** atom(s) possess a slightly positive charge? ***Which*** atom(s) are slightly negative?