Module 02: Chemistry of Life — Study Questions

1. What three subatomic particles make up an atom, and where is each located?
2. An element has 8 protons. How many electrons does a neutral atom have? What element is this?
3. What is the difference between atomic number and mass number?
4. Carbon-12 and Carbon-14 are isotopes. What makes them different, and what makes them the same?
5. What is the difference between an ionic bond and a covalent bond?
6. What does "polar" mean when describing water molecules?
7. Why are hydrogen bonds considered weak, yet still important in biology?
8. How does electronegativity determine what type of bond forms between atoms?
9. Explain how hydrogen bonding between water molecules creates cohesion.
10. Why does ice float on liquid water, and why is this biologically important?
11. How does water's high specific heat benefit living organisms?
12. What makes water an excellent solvent for many substances?
13. What does the pH scale measure, and what do the numbers represent?
14. A solution has a pH of 3. Is it acidic or basic? How does it compare to pure water (pH 7)?
15. How do buffers help maintain stable conditions inside cells?
16. What is unique about carbon that allows it to form the backbone of so many different molecules?

17. What is the difference between organic and inorganic compounds?

18. Name three functional groups found in biological molecules and describe a property of each.