Biology 12 Name: _____

Introduction Per: _____ Date: _____

A Brief Chemistry Reference

BC Biology 12 (Appendix B, pages 493 – 499)

Match the terms to the correct definition.

1. D matter	A. either elements or compounds
2. A pure substance	B. contain two or more pure substances in random physical assortment
3. E element	C. made up of subatomic particles
4. F compound	D. anything that takes up space and has mass
5. B mixture	E. cannot be broken down further
6. C atoms	F. pure substance made up of two or more elements that have been chemically combined in a fixed ratio

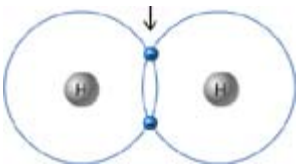
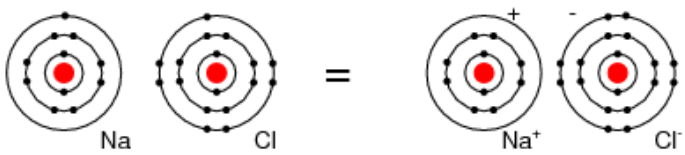
7. **Complete** the table.

Subatomic Particle	Symbol	Type of Charge	Amt of Charge	Mass (u)
Proton	p^+	positive	+1	1.0
Neutron	n^o	neutral	0	1.0
Electron	e^-	negative	-1	0.00055

8. The protons and neutrons are clustered together in the nucleus [a], which contains over 99% [b] of an atom's mass but makes up less than 1% [c] of its volume. The electrons surround the nucleus in regions called shells [d]. Electrons make up less than 1% [e] of an atom's mass, although the shells they occupy make up over 99% [f] of its volume.

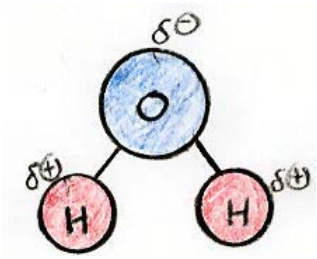
9. What is the name of the outermost shell? valence shell

10. Distinguish between *covalent bonds* and *ionic bonds*.

Covalent bonds	
Description Valence electrons are shared between atoms	Diagram H_2 
Ionic bonds	
Description Atoms transfer electrons: - gaining = negative ion (anion) - losing = positive ion (cation)	Diagram NaCl 

11. Most of the biochemical reactions in a living cell take place in a water solution. Water has a special type of bond called a polar covalent bond [(a)]. This bond is due to the unequal sharing of electrons between the oxygen and hydrogen atoms. The attraction between water molecules is called a hydrogen bond [(b)]. These are weaker than covalent bonds but are strong compared to other bonds that form between molecules. Hydrogen bonds are found not just in water – they are also in other important biological molecules, such as DNA [(c)] and proteins [(d)].

12. **Draw** a diagram of a water molecule in the space below (including the polarity).



13. What is an **ion**? In your description use the terms *cation* and *anion*.

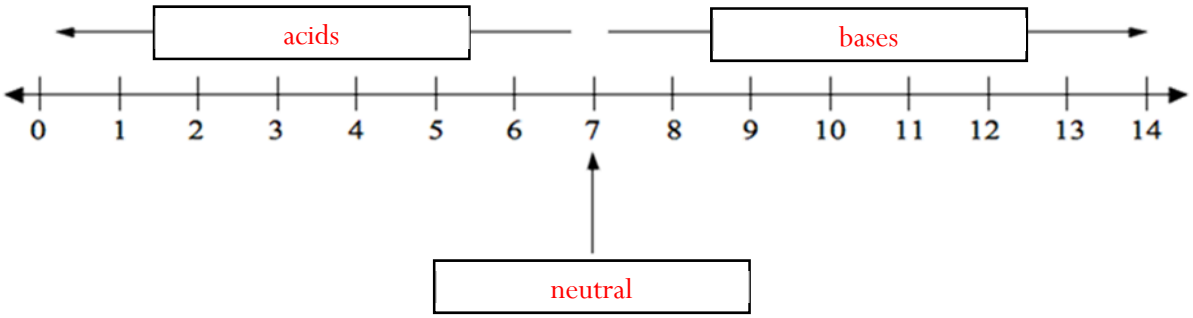
An atom that has gained an electron and is negatively charged is called an anion.

An atom that has lost an electron is positively charged is called a cation.

14. **Name** each ion with the described biological significance. *NOT in the same order as the textbook!*

Name	Symbol	Special Significance
bicarbonate	HCO_3^-	important in acid-base balance
hydrogen	H^+	important in acid-base balance
hydroxide	OH^-	important in acid-base balance
phosphate	PO_4^{3-}	found in bones, teeth, and the high-energy molecules that cells use for energy
sodium	Na^+	found body fluids; important in muscle contraction and nerve conduction
potassium	K^+	found primarily inside cells; important in muscle contraction and nerve conduction
calcium	Ca^{2+}	found in bones and teeth; important in muscle contractions
chloride	Cl^-	found in body fluids; important in maintaining fluid balance

15. Complete the pH scale below.



16. Which of the following body substances is the most acidic?

A. saliva

B. stomach fluids

C. blood

D. pancreatic fluids

17. Use the tables on pages 498 - 499 to define the following prefixes or suffixes.

a) cereb- pertaining to the brain

b) circ- around

c) cyto- cell

d) derm-/-derm skin

e) erythro- red

f) gastro- stomach

g) hydr/o- water

h) hyper- above

i) hypo- below

j) leuc/o- white

k) nephr- kidney

l) -oma tumor or swelling

m) pneum- lung

n) ur- pertaining to urine or urinary system

o) visc- internal