These review questions are for Bio 1 Chemistry topic. The questions were adapted from several sources, including the textbook's review questions.

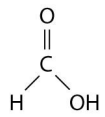
Multiple choice review questions:

1) Only about 12 elements (types of atoms) are found in significant levels in living things. Which four of these 12 elements make up approximately 96% of living matter?

A) carbon, sodium, hydrogen, nitrogen
B) carbon, oxygen, phosphorus, hydrogen
C) oxygen, hydrogen, calcium, nitrogen
D) carbon, hydrogen, nitrogen, oxygen
E) carbon, oxygen, nitrogen, calcium

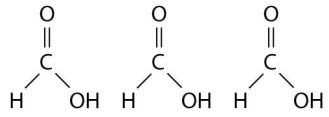
2) The atomic symbol for Calcium is

A) C
B) Ca
C) K
D) Cal
E) Ka



3) The molecule above has a molecular formula of…

A) CHO_1
B) 2O2H1C
C) O2H2C
D) $H_2O_2C_1$
E) CH_2O_2



4) The illustration above shows three of the same molecule. What is the molecular formula that represents the group of molecules?

A) $3CHO_1$
B) 6O6H3C
C) O6H6C3
D) $3H_2O_2C_1$
E) $3CH_2O_2$

5) A sodium ion is represented as Na^+. Sodium ions form from non-ionic sodium atoms when...

A) One electron is gained
B) One electron is lost
C) One proton is gained
D) One proton is lost
E) More than one proton or electron is gained or lost

6) An atom with a net positive charge must have more

A) Protons than neutrons
B) Protons than electrons
C) Electrons than neutrons
D) Electrons than protons

7) What is the name of the ion PO_4^{3-}

A) Hydroxide ion
B) Phospho-oxygenate ion
C) Negative phosphyion
D) Bicarbonate ion
E) Phosphate ion

8) What is an ionic bond?

A) All the bonds within a molecule.
B) The sharing of single electrons between atoms.
C) The electrostatic attraction between oppositely charged ions.
D) The sharing of protons between atoms.
E) The sharing of electrons between atoms.

9) A covalent chemical bond is one in which

A) electrons are removed from one atom and transferred to another atom so that the two atoms become oppositely charged.
B) protons and neutrons are shared by two atoms so as to satisfy the requirements of both atoms.
C) atoms share a pair of electrons
D) outer-shell electrons of one atom are transferred to fill the inner electron shell of another atom.
E) a proton occupies a hybrid orbital located between the nuclei of two atoms.

10) What results from an unequal sharing of electrons between atoms?

A) a nonpolar covalent bond
B) a polar covalent bond
C) an ionic bond

D) a hydrogen bond
E) a hydrophobic interaction

11) "Electronegative" means the strength that an atom pulls on electrons. A covalent bond is most likely to be polar when...

A) one of the atoms sharing electrons is much more electronegative than the other atom.
B) the two atoms sharing electrons are equally electronegative.
C) the two atoms sharing electrons are different elements.
D) one of the atoms has absorbed more energy than the other atom.

12) Nitrogen is much more electronegative (pulls more strongly on electrons) than hydrogen. Which of the following statements is correct about the atoms in ammonia (NH_3)?

A) Each hydrogen atom has a partial positive charge; the nitrogen atom has a partial negative charge.
B) The nitrogen atom has a strong positive charge; each hydrogen atom has a strong positive charge.
C) Each hydrogen atom has a slight negative charge; the nitrogen atom has a strong positive charge.
D) The nitrogen atom has a slight positive charge; each hydrogen atom has a slight negative charge.

13) When two atoms are equally electronegative (equal pull on electrons), they will interact to form

A) hydrogen bonds.
B) van der Waals interactions.
C) polar covalent bonds.
D) nonpolar covalent bonds.
E) ionic bonds.

14) Which bond is more difficult to disrupt when molecules are put into water?

A) covalent bond
B) ionic bond
C) covalent bonds and ionic bonds are equally difficult to disrupt in water

15) Which of the following is true for this chemical reaction?

$3H_2 + N_2 \rightarrow 2NH_3$

A) The number of molecules does not change
B) Hydrogen and nitrogen molecules are the products
C) Hydrogen and nitrogen molecules are the reactants
D) Ammonia is being broken apart into nitrogen and hydrogen

16) What coefficients must be placed in the following blanks so that there are equal numbers of atoms in the reactants and the products?

$C_6H_{12}O_6$ -> ____ C_2H_6O + ____ CO_2

A) 1; 2
B) 3; 1
C) 1; 3
D) 1; 1
E) 2; 2

17) Which statement is true of all atoms that are negative ions?
A) The atom has more electrons than protons
B) The atom has more protons than electrons
C) The atom has fewer protons than does a neutral atom of the same element
D) The atom has more neutrons than protons
E) The net charge is 1-

Answers to multiple choice questions:
1) D
2) B
3) E
4) E
5) B
6) B
7) E
8) C
9) C
10) B
11) A
12) A
13) D
14) A
15) C
16) E
17) A