Vasquez High School -- Chemistry -- Exam #5 -- Chapter 12 -- 100 points

Write TRUE if the statement is true OR write the word(s) that substitute(s) for the underlined word(s) that would make it true. Writing false earns partial credit. Three points apiece.

_____ 1) A common yet very dangerous gas used in the semiconductor industry is silane, SiH_4. A molecule of silane most likely has a square bipyrimidial shape.

_____ 2) In general, electronegativity decreases from left to right across a period.

_____ 3) Sometimes we need to use double or triple bonds to satisfy the octet rule.

_____ 4) When more than one Lewis structure can be correctly drawn for the same molecule, we call them resonant structures.

_____ 5) Diatomic molecules that are formed from two different types of nonmetal atoms generally form polar covalent bonds.

Short Answer/Fill-in. Be neat and complete. Three points.

6) Which of the following has a different electron configuration than the others?

S^{2-} K^{+} Ar Br^{-} Cl^{-} Ca^{2+}

7) For the molecule iodine monochloride, ICl, the end of the molecule which is positive relative to the other end belongs to the _____ ion.

8) In stable compounds, atoms tend to achieve the electron configuration of the nearest _____.

9) The sulfur atom in the molecule SF_2Cl_4 has how many electrons around it? _____

10) For each of the following properties and behaviors, write I if it pertains to ionic bonds and compounds and C if if pertains to covalent bonds and compounds. One point each.

_____ low boiling points

_____ when dissolved in water conducts electricity

_____ most commonly formed by a combination of non-metals

_____ water is a good example

_____ results from the transfer of electrons

_____ diatomic gases are these

_____ individual molecules are formed

_____ atoms are aligned in crystalline lattices

Short Essay. Two to four sentences here. READ WHAT YOU WRITE! Five points each.

11) What is a polar bond? What causes a covalent bond to be polar? _____

_____

_____

_____.

12) Why does beer foam up when you add salt to it? _____

_____

_____

_____.

13) What does VSEPR Theory stand for AND what does it determine in molecules? _____

_____

_____

_____.

14) Write the freezing point of carbon dioxide and four of its properties of it as well: _____

_____

_____

_____.

Matching Section. Write the letter that best corresponds to each term. More than one answer may be correct. Two points each.

_____ 14) dipole moment	a) nitrogen gas is a good example of this
	b) oxygen gas is a good example of this
_____ 15) lone pair	c) same as a bonded pair
	d) water is a good example of this
_____ 16) triple bond	e) acetylene is a good example of this
	f) hydrochloric acid is a good example of this
_____ 17) nonpolar molecule	g) sodium chloride is a good example of this
	h) same as unshared pair
_____ 18) bent molecule	i) charge times distance
	j) time it takes to make two poles

For each of the following, write the proper Lewis diagram and describe its molecular geometry. Five points.

19) AsH_3 20) TeI_2 21) CCl_2F_2

Multiple Choice. Write the letter that best answers each example. Three points.

_____ 22) The total number of valence electrons in 2-butene, C_4H_8, is

a) 12 b) 18 c) 24 d) 56

_____ 23) Which compound is most likely to have trigonal pyramid structure?

a) NCl_3 b) $CaCl_2$ c) BCl_3 d) $GaCl_3$

_____ 24) The electron configuartion $1s^2 2s^2 2p^6 3s^2 3p^6$ is the correct electron configuration for the most stable form of which ion?

a) calcium ion b) magnesium ion c) fluoride ion d) oxide ion

_____ 25) The most likely form of the simple binary ionic compound between magnesium and nitrogen is:

a) MgN b) Mg_2N_3 c) Mg_3N_2 d)Mg_2N_5

_____ 26) Which statement is NOT generally true?

a) Double bonds have more bond energy than single bonds.
b) Triple bonds have more bond energy than double bonds.
c) Polar covalent bonds have more energy than ionic bonds.
d) The polarity of a bond depends on the differences in electronegativity.

27) Draw the Lewis structure of the nitrate ion, NO_3^-, with all acceptable resonant structures. Five points.

28) Extra Credit. Three points, all or nothing. The bond angle in a tetrahedral molecule is 109.5°, yet the bond angle in water is only 104.5°. Why is that?

_____

_____

_____.