Chapter 12 Prep-Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. A measure of the ability of an atom in a chemical compound to attract electrons is called
   A. electron affinity.  C. electronegativity.
   B. electron configuration.  D. ionization potential.

2. The element that has the greatest electronegativity is
   A. oxygen.  C. chlorine.
   B. sodium.  D. fluorine.

3. When chemical compounds form, valence electrons are those that may be
   A. lost only.  C. shared only.
   B. gained only.  D. lost, gained, or shared.

4. For Groups 13 through 18, the number of valence electrons is equal to the group number
   A. plus 1.  C. minus the period number.
   B. plus the period number.  D. minus 10.

5. How many valence electrons are in an atom of phosphorus?
   A. 2  C. 4
   B. 3  D. 5

6. How many valence electrons does a helium atom have?
   A. 2  C. 4
   B. 3  D. 5

7. What is the charge on the strontium ion?
   A. 2–  C. 1+
   B. 1–  D. 2+

8. How does oxygen obey the octet rule when reacting to form compounds?
   A. It gains electrons.
   B. It gives up electrons.
   C. It does not change its number of electrons.
   D. Oxygen does not obey the octet rule.

9. Ionic compounds are normally in which physical state at room temperature?
   A. solid  C. gas
   B. liquid  D. plasma
10. Which of the following particles are free to drift in metals?
   A  protons  C  neutrons
   B  electrons  D  cations

11. An Ionic bond is a bond between _____.
   A  a cation and an anion  C  the ions of two different metals
   B  valence electrons and cations  D  the ions of two different nonmetals

12. A chemical bond results from the mutual attraction of the nuclei of atoms and
   A  electrons.  C  neutrons.
   B  protons.  D  dipoles.

13. The Na - F bond in NaF (electronegativity for Na is 0.9; electronegativity for F is 4.0) is
   A  polar covalent.  C  nonpolar covalent.
   B  ionic.  D  pure covalent.

14. In which of these compounds is the bond between the atoms NOT a nonpolar covalent bond?
   A  Cl₂  C  HCl
   B  H₂  D  O₂

   A. Cl—H:   B. H—Cl:  C. H—Cl:  D. H—Cl:

15. What is the Lewis structure for hydrogen chloride, HCl?
   A  A  C  C
   B  B  D  D

16. VSEPR theory is a model for predicting
   A  the strength of metallic bonds.  C  lattice energy values.
   B  the shape of molecules.  D  ionization energy.

17. Use VSEPR theory to predict the molecular shape of the carbon tetraiodide molecule, Cl₄.
   A  tetrahedral  C  bent
   B  linear  D  trigonal planar

18. Which molecule is linear?
   A  SO₂  C  H₂S
   B  CO₂  D  Cl₂O
19 What is the molecular geometry of this lewis structure (NF₃)?
A square pyramidal  C trigonal pyramidal
B tetrahedral  D linear

20 Which of the following compounds has an ionic bond?
A SO₃  C NaCl
B HCl  D CO₂

21 Which of the following is the best representation of the compound rubidium chloride?

22 How many valence electrons are in a Se²⁻ ion?
A 8  C 6
B 7  D 2

23 In the Molecular Models Lab, you built the structure for Hydrogen Fluoride. What is the polarity of that molecule and why?
A Nonpolar because H and F have the same electronegativities.
B Polar because H and F are both nonmetals.
C Polar because F is more electronegative than H.
D Nonpolar because H is more electronegative than F.
Matching

Match each item with the correct statement below.

A  halide ion  E  valence electron
B  octet rule  F  acid base reaction
C  ionic bond  G  metallic bond
D  Lewis dot structure  H  bent molecule

24  an electron in the highest occupied energy level of an atom

25  Atoms react so as to acquire the stable electron structure of a noble gas.

26  a depiction of valence electrons around the symbol of an element

27  the attraction of valence electrons for metal ions

28  the force of attraction binding oppositely charged ions together

29  Group 7 (or 17) anions

30  H₂O