

1. In a propanal molecule, an oxygen atom is bonded with a carbon atom. What is the total number of pairs of electrons shared between these atoms?  
A) 1      B) 2      C) 3      D) 4
2. Which symbol represents an atom in the ground state with the most stable valence electron configuration?  
A) B      B) O      C) Li      D) Ne
3. When a sodium atom reacts with a chlorine atom to form a compound, the electron configurations of the ions forming the compound are the same as those in which noble gas atoms?  
A) krypton and neon      B) krypton and argon  
C) neon and helium      D) neon and argon
4. Which is the correct electron-dot formula for a molecule of chlorine?  
A)  $\begin{array}{cc} \cdot\cdot & \cdot\cdot \\ \cdot\text{Cl} & ; \text{Cl}\cdot \\ \cdot\cdot & \cdot\cdot \end{array}$       B)  $\begin{array}{cc} \cdot\cdot & \cdot\cdot \\ :\text{Cl} & : :\text{Cl} : \\ \cdot\cdot & \cdot\cdot \end{array}$   
C)  $\begin{array}{cc} \cdot\cdot & \cdot\cdot \\ :\text{Cl} & : :\text{Cl} : \\ \cdot\cdot & \cdot\cdot \end{array}$       D)  $\begin{array}{cc} \cdot\cdot & \cdot\cdot \\ :\text{Cl} & : \text{Cl} : \\ \cdot\cdot & \cdot\cdot \end{array}$
5. What is the most likely electronegativity value for a metallic element?  
A) 1.3      B) 2.7      C) 3.4      D) 4.0
6. Which element has an atom with the greatest tendency to attract electrons in a chemical bond?  
A) carbon      B) chlorine  
C) silicon      D) sulfur
7. Given the electron dot diagram:  
 $\text{H}:\ddot{\text{F}}:$   
The electrons in the bond between hydrogen and fluorine are more strongly attracted to the atom of  
A) hydrogen, which has the higher electronegativity  
B) fluorine, which has the higher electronegativity  
C) hydrogen, which has the lower electronegativity  
D) fluorine, which has the lower electronegativity
8. Which type of bonding is usually exhibited when the electronegativity difference between two atoms is 1.1?  
A) ionic      B) covalent  
C) metallic      D) network
9. Which pair of elements below will form a compound with the greatest ionic character?  
A) Pb and F      B) Ca and O  
C) Na and Cl      D) Cs and N
10. Which atom will form the most polar bond with the greatest degree of ionic bonding when bonding with sodium?  
A) F      B) Cl      C) I      D) Br
11. Which bond has the greatest degree of ionic character?  
A) H-Cl      B) I-Cl      C) Cl-Cl      D) K-Cl
12. Given the electron dot formula:  
 $\text{H}:\ddot{\text{X}}:$   
Which atom represented as X would have the *least* attraction for the electrons that form the bond?  
A) F      B) Cl      C) I      D) Br

13. In which compound do the atoms have the greatest difference in electronegativity?

- A) NaBr B) AlCl<sub>3</sub> C) KF D) LiI

14. If the electronegativity difference between the elements in compound NaX is 2.1, what is element X?

- A) bromine B) chlorine  
C) fluorine D) oxygen

15. The data table below represents the properties determined by the analysis of substances A, B, C, and D.

Substance	Melting Point (°C)	Boiling Point (°C)	Conductivity
A	-80	-20	none
B	20	190	none
C	320	770	as solid
D	800	1250	in solution

Which substance is an ionic compound?

- A) A B) B C) C D) D

16. As NaC<sub>2</sub>H<sub>3</sub>O<sub>2</sub>(s) is stirred into water and dissolves, the electrical conductivity of the solution

- A) decreases B) increases  
C) remains the same

17. As 1 gram of sodium hydroxide dissolves in 100 grams of water, the conductivity of the solution

- A) decreases B) increases  
C) remains the same

18. Which substance dissolves in pure water and produces a solution that is a good conductor of electricity?

- A) CaCl<sub>2</sub> B) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>  
C) N<sub>2</sub> D) O<sub>2</sub>

19. The bonds in BaO are best described as

- A) covalent, because valence electrons are shared  
B) covalent, because valence electrons are transferred  
C) ionic, because valence electrons are shared  
D) ionic, because valence electrons are transferred

20. Which Lewis electron-dot diagram correctly represents a hydroxide ion?

- A)  $\left[ \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{O} \\ \cdot\cdot \\ \cdot\cdot \end{array} \text{H} \right]^{-}$  B)  $\left[ \text{O} \text{H} \right]^{-}$   
C)  $\left[ \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{O} \\ \cdot\cdot \\ \cdot\cdot \end{array} \text{H} \right]^{-}$  D)  $\left[ \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{O} \\ \cdot\cdot \\ \cdot\cdot \end{array} \text{H} \right]^{-}$

