Name _____ **Date:** _____

Part 1 - Multiple Choice: Write your answer in the box on the left.

1. In a non-nuclear chemical reaction, the total number of atoms in the reactants must equal the total number of atoms in products. The previous statement is known as the ____.

   A. Law of conservation of energy.
   B. Law of conservation of mass.
   C. Law of conservation of atoms.
   D. Law of conservation of chemistry.

2. Which type of chemical reaction involves the combination of two elements?

   A. Decomposition
   B. Combustion
   C. Synthesis
   D. Coefficient

3. What is the term for the number placed in front of a formula in a balanced equation?

   A. Decomposition
   B. Combustion
   C. Synthesis
   D. Coefficient

4. Which type of chemical reaction involves the breaking apart of a larger molecule into smaller molecules?

   A. Decomposition
   B. Combustion
   C. Synthesis
   D. Coefficient

5. What is the term for a chemical equation listing the formulas involved, but it is not balanced.

   A. Skeleton equation
   B. Word equation
   C. Unbalanced equation
   D. Nuclear equation

6. What type of reaction is the following: $2Fe + 3S \rightarrow Fe_2S_3$

   A. Decomposition
   B. Combustion
   C. Synthesis
   D. Coefficient

7. In a combustion chemical reaction, one of the reactants must be ___.

   A. Hydrogen
   B. Carbon
   C. Helium
   D. Oxygen

8. In the following balanced equation, $4Fe + 3O_2 \rightarrow 2Fe_2O_3$, what is the coefficient of the *Fe* term?

   A. 4
   B. 3
   C. 2

9. The complete combustion of a fuel (like propane) always produces _____.

   A. Carbon dioxide and hydrogen
   B. Hydrogen and oxygen
   C. Carbon and water
   D. Carbon dioxide and water

10. What must be in front of the *KOH* term to balance the following reaction: $K_2O + H_2O \rightarrow$ ___KOH

    A. 1
    B. 2
    C. 3
    D. 4

11. What elements are unbalanced given this reaction: $2KF + BaBr_2 \rightarrow BaF_2 + KBr$

    A. K and F
    B. Ba and Br
    C. Ba and F
    D. K and Br

12. To balance the following chemical equation, Cu_2O + __HCl → 2CuCl + H_2O, what must be the coefficient of *HCl*?

    A. 1
    B. 2
    C. 3
    D. 4

13. What must be in front of *HF* to balance the following: SiO_2 + ___HF → $2H_2O + SiF_4$

    A. 1
    B. 2
    C. 3
    D. 4

14. What must be the coefficient of H_2O to balance the following: $4NH_3 + 3O_2 \rightarrow 2N_2$ + ___H_2O

    A. 4
    B. 6
    C. 8
    D. 10

15. In the following reaction, $(NH_4)_2S + Pb(NO_3)_2 \rightarrow \_\_\_NH_4NO_3 + PbS$, what number in front of NH_4NO_3 will balance the equation?

A. 2
B. 4
C. 6
D. 8

16. In the following reaction, $Al_2(SO_4)_3 + 3Ca(OH)_2 \rightarrow 2Al(OH)_3 + \_\_\_CaSO_4$, what must be the coefficient of $CaSO_4$?

A. 1
B. 2
C. 3
D. 4

17. The following equation is balanced: $4NH_3 + 3O_2 \rightarrow 2N_2 + 6H_2O$

A. True
B. False

18. The following equation is balanced: $CO + O_2 \rightarrow CO$

A. True
B. False

19. What type of reaction is the following: $Al_2O_3 \rightarrow Al + O_2$

A. Decomposition
B. Combustion
C. Synthesis
D. Coefficient

20. In the following reaction, what must be the values of X, Y and Z? $\boldsymbol{X}Al_2O_3 \rightarrow \boldsymbol{Y}Al + \boldsymbol{Z}O_2$

A. X = 3, Y = 4, Z = 2
B. X = 2, Y = 4, Z = 3
C. X = 4, Y = 2, Z = 3
D. X = 2, Y = 3, Z = 4

Part 2 – Balance the following chemical reactions:

21. $Fe_2O_3 + CO \rightarrow Fe + CO_2$

22. $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$

23. $SrF_2 + (H_3O)_3(PO_4) \rightarrow Sr_3(PO_4)_2 + (H_3O)F$