Name: _____

1) Which equation represents a double replacement reaction?

A) $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$
B) $CaCO_3 \longrightarrow CaO + CO_2$
C) $LiOH + HCl \longrightarrow LiCl + H_2O$
D) $2Na + 2H_2O \longrightarrow 2NaOH + H_2$

2) Given the reaction:

$$Mg(s) + 2AgNO_3(aq) \longrightarrow Mg(NO_3)_2(aq) + 2Ag(s)$$

Which type of reaction is represented?

A) single replacement
B) synthesis
C) decomposition
D) double replacement

3) What is the correct IUPAC name for the compound NH_4Cl?

A) nitrogen chloride
B) ammonium chlorate
C) ammonium chloride
D) nitrogen chlorate

4) Which formula correctly represents the composition of iron (III) oxide?

A) Fe_3O_2
B) FeO_3
C) Fe_2O_3
D) Fe_3O

5) The percent by mass of hydrogen in NH_3 is equal to

A) $\frac{17}{1} \times 100$
B) $\frac{17}{3} \times 100$
C) $\frac{3}{17} \times 100$
D) $\frac{1}{17} \times 100$

6) In which compound is the percent by mass of oxygen greatest?

A) BeO
B) CaO
C) SrO
D) MgO

7) A sample of a substance containing only magnesium and chlorine was tested in the laboratory and was found to be composed of 74.5% chlorine by mass. If the total mass of the sample was 190.2 grams, what was the mass of the magnesium?

A) 48.5 g
B) 142 g
C) 70.9 g
D) 24.3 g

8) What is the percent by mass of water in the hydrate $Na_2CO_3 \cdot 10H_2O$ (formula mass = 286)?

A) 6.89%
B) 214.5%
C) 62.9%
D) 26.1%

9) A hydrate is a compound with water molecules incorporated into its crystal structure. In an experiment to find the percent by mass of water in a hydrated compound, the following data were recorded:

Mass of crucible + hydrated crystals before heating	7.50 grams
Mass of crucible	6.90 grams
Mass of crucible + anhydrous crystals after heating	7.20 grams

What is the percent by mass of water in the hydrate?

A) 96.%
B) 72.%
C) 8.0%
D) 50.%

10) What is the empirical formula for the compound $C_6H_{12}O_6$?

A) CH_2O B) $C_6H_{12}O_6$ C) $C_3H_6O_3$ D) $C_2H_4O_2$

11) Vitamin C has an empirical formula of $C_3H_4O_3$ and a molecular mass of 176. What is the molecular formula of vitamin C?

A) $C_9H_{12}O_9$ B) $C_{10}H_8O_3$ C) $C_6H_8O_6$ D) $C_3H_4O_3$

12) Which equation illustrates conservation of mass?

A) $H_2 + Cl_2 \longrightarrow 2HCl$
B) $H_2 + Cl_2 \longrightarrow HCl$
C) $H_2 + O_2 \longrightarrow 2H_2O$
D) $H_2 + O_2 \longrightarrow H_2O$

13) Given the unbalanced equation:

$$\_\_Al + \_\_CuSO_4 \longrightarrow \_\_Al_2(SO_4)_3 + \_\_Cu$$

When the equation is balanced using the smallest whole-number coefficients, what is the coefficient of Al?

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

14) Given the unbalanced equation:

$$Al + O_2 \longrightarrow Al_2O_3$$

When this equation is completely balanced using smallest whole numbers, what is the sum of the coefficients?

A) 4 B) 7 C) 9 D) 5

15) Given the unbalanced equation:

$$\_\_Fe_2O_3 + \_\_CO \longrightarrow \_\_Fe + \_\_CO_2$$

When the equation is correctly balanced using the smallest whole-number coefficients, what is the coefficient of CO?

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

16) What is the gram formula mass of $Ca_3(PO_4)_2$?

A) 135 g/mol B) 215 g/mol C) 310. g/mol D) 278 g/mol

17) Approximately howmany atoms are there in 3.0 moles of Al?

A) $3(6.0 \times 10^{23})$
B) $4(6.0 \times 10^{23})$
C) 6.0×10^{23}
D) $2(6.0 \times 10^{23})$

18) What is the total number of moles of atoms in one mole of $(NH_4)_2SO_4$?

A) 14 B) 15 C) 10 D) 11

19) Given the equation:

$$2C_2H_2(g) + 5O_2(g) \longrightarrow 4CO_2(g) + 2H_2O(g)$$

How many moles of oxygen are required to react completely with 1.0 mole of C_2H_2?

A) 10 B) 5.0 C) 2.5 D) 2.0

20) Given the reaction:

$$6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$$

What is the total number of moles of water needed to make 2.5 moles of $C_6H_{12}O_6$?

A) 6.0 B) 12 C) 2.5 D) 15