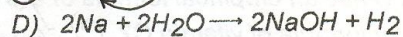Name: _____

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:

   $$Mg(s) + 2AgNO_3(aq) \longrightarrow Mg(NO_3)_2(aq) + 2Ag(s)$$
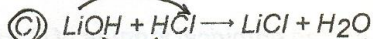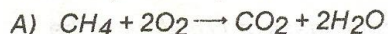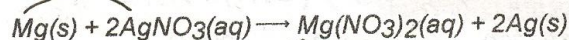
   Which type of reaction is represented?
   A) single replacement
   B) synthesis
   C) decomposition
   D) double replacement

3) What is the correct IUPAC name for the compound NH_4Cl?   TABLE [E] "polys"
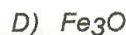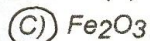   A) nitrogen chloride
   B) ammonium chlorate
   C) ammonium chloride
   D) nitrogen chlorate

4) Which formula correctly represents the composition of iron (III) oxide? $Fe^{+3}O^{-2}$
   A) Fe_3O_2
   B) FeO_3
   C) Fe_2O_3
   D) Fe_3O

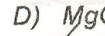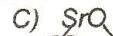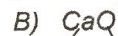5) The percent by mass of hydrogen in NH_3 is equal to $14+3 = 17$
   A) $\frac{17}{1} \times 100$
   B) $\frac{17}{3} \times 100$
   C) $\frac{3}{17} \times 100$
   D) $\frac{1}{17} \times 100$

6) In which compound is the percent by mass of oxygen greatest?
   A) BeO Be, lightest atomic   9+16
   B) CaO 40   16
   C) SrO Sr, heaviest atomic mass   88   16
   D) MgO 24   16   } Go to Group 2 PERIODIC TABLE

7) A sample of a substance containing only magnesium and chlorine was tested in the laboratory TABLE
   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?   1) 100% - 74.5% = 25.5%   2) 190.2 × 25.5% = 48.5 g
   A) 48.5 g
   B) 142 g
   C) 70.9 g
   D) 24.3 g
   2) 190.2 × 25.5% = 48.5 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% $\frac{180}{286} \times 100$

9) A hydrate is a compound with water molecules incorporated into its crystal structure. In an   "The legal age for drinking water is 18."
   experiment to find the percent by mass of water in a hydrated compound, the following data were
   recorded:

   H_2O
   HYDRATE → ANHYDROUS
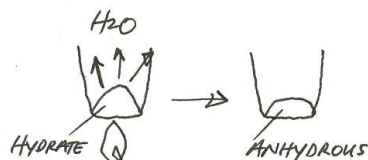
Mass of crucible + hydrated crystals before heating	7.50 grams
Mass of crucible	6.90 grams
Mass of crucible + anhydrous crystals after heating	7.20 grams

   $7.50 - 7.20 = 0.30\ g$ H_2O
   $7.50 - 6.90 = 0.60\ g$ Hydrate

   What is the percent by mass of water in the hydrate?
   A) 96.%
   B) 72.%
   C) 8.0%
   D) 50.%

   $\% H_2O = \frac{0.30}{0.60} \times 100 = 50\%$

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

Simplest ratio of atoms

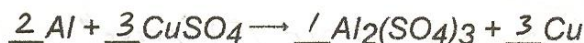(A) CH_2O B) $C_6H_{12}O_6$ C) $C_3H_6O_3$ D) $C_2H_4O_2$

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? 1st) $36 + 4 + 48 = 88$ 2nd) $176/88 = $ (2)

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?(atoms) 3rd) $(C_3H_4O_3) \times 2$

(A) $H_2 + Cl_2 \longrightarrow 2HCl$ *Balanced Equation*   C) $H_2 + O_2 \longrightarrow 2H_2O$

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

13) Given the unbalanced equation:

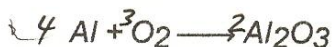$$\underline{2}\, Al + \underline{3}\, CuSO_4 \longrightarrow \underline{1}\, Al_2(SO_4)_3 + \underline{3}\, Cu$$

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:

$$\underline{4}\, Al + \overset{3}{}O_2 \longrightarrow \overset{2}{}Al_2O_3$$

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:

$$\underline{1}\, Fe_2O_3 + \underline{3}\, CO \longrightarrow \underline{2}\, Fe + \underline{3}\, CO_2$$

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

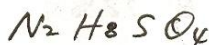16) What is the gram formula mass of $Ca_3(PO_4)_2$? $120 + 62 + 128 = 310$

     $P_2 \; O_8$

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

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

(A) $3(6.0 \times 10^{23})$ C) 6.0×10^{23}

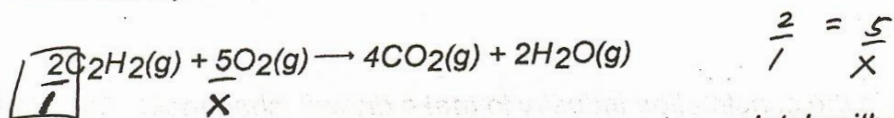B) $4(6.0 \times 10^{23})$ D) $2(6.0 \times 10^{23})$

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

$$N_2 \; H_8 \; S \; O_4$$

15 atoms $\longrightarrow$ 15 moles atoms

19) Given the equation:

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

$\dfrac{2}{1} = \dfrac{5}{X}$

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:

"1" is assumed

$$6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$$
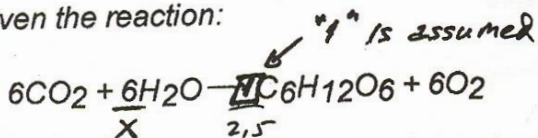
$\dfrac{6}{X} = \dfrac{1}{2.5}$

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