MOLE CALCULATIONS (Review)

1. Calculate the relative molecular mass of the following substances.
A. H_2SO_4
B. $C_6H_{12}O_6$
C. CH_4
D. N_2H_4
E. KNO_3

2. Which of the following nitrogen compounds is heavier? Calculate the density of the heavier one at STP.
A. NH_3
B. NO
C. N_2O_5
D. N_2O

3. Calculate the relative density of SO_2 gas with respect to H_2 gas at STP.

4. What is the formula of the compound composed of silicon and oxygen atoms if the mass ratio of silicon to oxygen is 7:8?

5. Write the formulae of the oxides of iron compounds if the mass ratios of iron to oxygen atom are 7:3 and 7:2.

6. Write short form of substance:
A. Atomic weight of sulfur is equal to 32;
B. Mass of water is 50 gram;
C. Amount of iron substance equal 2.5 mol;
D. Molar mass of hydrogen(H_2)equal to 2 gr/mol;
E. Relative molecular mass of calcium oxide (CaO);
F. Number of atoms of copper equal $1.806x10^{23}$;
G. Number of molecules of water equal $1.204x10^{23}$.

7. Write formulas of oxides and calculate molar masses of oxides:
A. Na and O
B. Fe(II) and O
C. Fe(III) and O
D. Pb(IV) and O
E. N(V) and O
F. Cr(VI) and O.

8. Calculate mass of carbon dioxide if number of its molecules is equal to $12.04x10^{23}$.

9. Mass of substance is 66 g and it consists of $9.03x10^{23}$ molecules. Calculate its molecular mass and define what substance is it:
A. water
B. carbon dioxide
C. methane
D. Calcium oxide.

10. Imagine that mother sad that Cinderella have to count number of molecules in 1 mg of iodine. If Cinderella counts 60 molecules in 1 min, how much time will it take to count all of them?

11. By diagram solve the exercises:

№	Substance	Molar mass, MM g\mole	Mass m, g	Amount of substance ν, mole	Number of particles (molecules, atom) N
A	O_2	32 g\mole	3.2 g	ν	N
B	Zn	65 g\mole	130 g	ν	N
C	H_2O	18 g\mole	180 g	ν	N
D	N_2	MM	m	0.5 mol	N
E	CO_2	MM	m	0.2 mol	N
F	HNO_2	MM	m	3 mol	N
G	SO_2	MM	m	ν	$0.602x10^{23}$
H	NO_2	MM	m	ν	$12.04x10^{23}$
I	NO	MM	m	ν	$180.3x10^{23}$

12. 5.4 g of glucose, $C_6H_{12}O_6$, is given. Calculate;
A. mole of glucose,
B. number of molecules,
C. number of C, H, O and total number atoms,
D. mass of each C, H, and O atoms.

13. A 1.12 L of a compound NX_2 weighs 2.3 g at STP. Which element is X in the compound?

14. An oxide of iron is composed of 70% iron and 30% oxygen elements. Find the formula of the oxide.

15. A compound of carbon and hydrogen contains totally 5 atoms. If 6.4 g of this compound contains $12.04x10^{23}$ atoms what would be the formula of the compound.

16. A gas mixture of H_2 and O_2 totally has 17.92 L at STP and has a mass of 10.6 g. Calculate the number of molecules of each gas in the mixture.

17. Calculate the mole number of hydrogen in each of the following;
A. 44.8 L of ammonia at STP
B. 196 g of sulfuric acid
C. 2 moles of water
D. 63 g of nitric acid
E. 3 g of hydrogen gas at STP

18. TNT is a powerful explosive made up of carbon, hydrogen, oxygen and nitrogen elements. Calculate the mass percent of nitrogen in the explosive.