General Chemistry HW 1

1. a) Determine the number of significant figures in the following numbers:
0.00320

450.00

2. a) Convert the following numbers to scientific notation.
0.00074

5,300,000

3. Perform the following calculation and express the result with the correct number of significant figures:
a. 6.308 x 1.9

b. 900 x 0.0300

c. 501/ 2.8

4. Perform the following calculation and express the result with the correct number of decimal places:
a. 7.56 + 2.37

b. 8.0 - 9.01

c. 160 + 0.001

5. Convert 8.7 miles to nanometers (1 mile = 1.61 km).

6. Differentiate between elements, compounds, heterogeneous mixtures, and homogeneous mixtures by providing an example for each.

7. What is the atomic number of phosphorus and how does it relate to the number of protons and electrons in an atom?

8. Why is the atomic mass of bromine not a not a whole number?

10. Explain the difference between covalent bonds and ionic bonds. Provide an example of a molecule or ionic compound that is formed by each type of bond.

11. Identify the group names for Group 1, Group 2, Group 17, and Group 18 on the periodic table. Provide one example element from each group.

12. a) Name the following binary ionic compounds:
LiF

CaBr$_2$

b) Write the formula for the following binary ionic compounds:
Potassium iodide

Magnesium nitride

c) Identify whether the following metals are Type I or Type II, and then name the compounds:
PbO

CoS

13. a) Name the following compounds:
K$_2$SO$_4$

(NH4)$_2$CO$_3$

Ba(NO$_3$)$_2$

b) Write the molecular formula for the following compounds:
Calcium carbonate

Iron (III) phosphate

c) Identify the type of ion (monatomic or polyatomic) and provide its charge:
SO_4^{2-}

NH_4^+

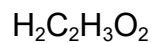**14. a) Name the following binary covalent compounds:**
PCl_5

SF_2

b) Write the formula for the following binary covalent compounds:
Dinitrogen tetroxide

Carbon disulfide

14. Name the following acids:

H_3PO_4

HF

$H_2C_2H_3O_2$

15. Calculate the molar mass of glucose ($C_6H_{12}O_6$).

16. How many molecules are there in 7.5 grams of sulfuric acid (H_2SO_4)?

17. Determine the number of oxygen (O) atoms in 22.5 grams of carbon dioxide.