Choice the right answer:

1. ( ) How many atoms are in a sulfuric acid molecule?
   A. 1       B. 7       C. 5       D. 6       E. 8

2. ( ) If a sample of propane, C\textsubscript{3}H\textsubscript{8}, contains a total of 6.0x10\textsuperscript{3} atoms of carbon, how many molecules of propane are in the sample?
   A. 6.0x10\textsuperscript{3}       B. 3.0x10\textsuperscript{3}       C. 8.0x10\textsuperscript{3}       D. 1.1x10\textsuperscript{4}       E. 2.0x10\textsuperscript{3}

3. ( ) A compound contains only calcium and fluorine. A sample of the compound is determined to contain 2.00 g of calcium and 1.90 g of fluorine. According to the Law of Definite Proportions, how much calcium should another sample of this compound contain if it contains 2.85 g of fluorine?
   A. 2.71 g       B. 4.00 g       C. 3.00 g       D. 4.50 g       E. 6.00 g

4. ( ) Which of the following is not the name of a cation?
   A. Sodium       B. iron (III)       C. aluminum       D. sulfide       E. ammonium

5. ( ) What is the formula for aluminum fluoride?
   A. AlF       B. Al\textsubscript{2}F\textsubscript{3}       C. Al\textsubscript{3}F       D. Al\textsubscript{3}F\textsubscript{2}       E. AlF\textsubscript{3}

6. ( ) What is the name of Fe(OH)\textsubscript{3}?
   A. iron hydroxide       B. iron trihydroxide       C. iron (III) hydroxide       D. iron (II) hydroxide       E. none of these

7. ( ) How many atoms are in 1.00 mole of water?
   A. 6.02x10\textsuperscript{23}       B. 1.20x10\textsuperscript{24}       C. 1.81x10\textsuperscript{24}       D. 2.41x10\textsuperscript{24}       E. 3.01x10\textsuperscript{23}

8. ( ) Calculate the mass of one bromine atom.
   A. 1.327x10\textsuperscript{-22} g       B. 6.022x10\textsuperscript{-23} g       C. 1.661x10\textsuperscript{-24} g       D. 4.812x10\textsuperscript{-25} g       E. 2.654x10\textsuperscript{-22} g

9. ( ) Determine the formula weight of Ca\textsubscript{3}(PO\textsubscript{4})\textsubscript{2}.
   A. 230 amu       B. 279 amu       C. 215 amu       D. 310 amu       E. 135 amu

10. ( ) How many grams of CaCl\textsubscript{2} equal 4.26 moles of CaCl\textsubscript{2}?
    A. 26.1 g       B. 170 g       C. 302 g       D. 473 g       E. 322 g

11. ( ) How many moles of POCl\textsubscript{3} are there in 10.0 grams of POCl\textsubscript{3}?
    A. 6.51x10\textsuperscript{-2} mol       B. 3.68x10\textsuperscript{-1} mol       C. 4.09x10\textsuperscript{-2} mol       D. 1.21x10\textsuperscript{-1} mol       E. 1.17x10\textsuperscript{-3} mol

12. ( ) How many moles CCl\textsubscript{4} are present in 118. g of carbon tetrachloride?
    A. 0.839       B. 1.19       C. 0.538       D. 1.30       E. 0.767

13. ( ) How many molecules are contained in 5.00 grams of NH\textsubscript{3}?
    A. 5.42x10\textsuperscript{22}       B. 3.00x10\textsuperscript{24}       C. 3.40x10\textsuperscript{22}       D. 1.77x10\textsuperscript{23}       E. 9.45x10\textsuperscript{22}

14. ( ) How many atoms of carbon are present in 34.5 g of caffeine, C\textsubscript{8}H\textsubscript{10}N\textsubscript{4}O\textsubscript{2}?
    A. 8.57x10\textsuperscript{23}       B. 2.68x10\textsuperscript{25}       C. 1.08x10\textsuperscript{24}       D. 2.09x10\textsuperscript{23}       E. 4.83x10\textsuperscript{23}

15. ( ) Which of the following is not a correct description of 16.0 grams of methane, CH\textsubscript{4}?
    A. It is one mole of methane.
    B. It is the amount of methane that contains 12.0 g of carbon.
    C. It is 16.0x6.02x10\textsuperscript{23} molecules of methane.
    D. It is the amount of methane that contains 4.0 grams of hydrogen.
    E. It is the amount of methane that contains 4x6.02x10\textsuperscript{23} hydrogen atoms.
16. A sample of ethane, $\text{C}_2\text{H}_6$, contains a total of 16N atoms, where $N=6.02 \times 10^{23}$. How much $\text{C}_2\text{H}_6$ is in the sample?
A. 2.0 g  B. 30 g  C. 60 g  D. 16 mol  E. 4 mol

17. What is the percent by mass of sulfur in Al$_2$(SO$_4$)$_3$?
A. 9.38%  B. 18.8%  C. 24.6%  D. 28.1%  E. 35.4%

18. Analysis of a sample of a covalent compound showed that it contained 14.4% hydrogen and 85.6% carbon by mass. What is the empirical formula for this compound?
A. CH  B. CH$_2$  C. CH$_3$  D. C$_2$H$_3$  E. C$_2$H$_5$

19. Determine the simplest formula for a hydrocarbon if the complete combustion of a sample produces 3.96 g of CO$_2$ and 2.16 g of H$_2$O.
A. C$_2$H$_3$  B. C$_3$H$_8$  C. CH$_3$  D. CH  E. C$_2$H$_5$

20. A compound is known to contain only carbon, hydrogen, and oxygen. If the complete combustion of a 0.150-g sample of this compound produces 0.225 g of CO$_2$ and 0.0614 g of H$_2$O, what is the empirical formula of this compound?
A. C$_3$H$_4$  B. CH$_4$O  C. C$_3$H$_5$O  D. C$_3$H$_4$O$_3$  E. C$_5$H$_7$O$_5$

21. A compound contains, by mass, 87.5% nitrogen and 12.5% hydrogen. Its molecular weight is found to be 32 g/mol. What is its molecular formula?
A. N$_2$H$_6$  B. N$_2$H$_4$  C. N$_2$H$_5$  D. NH$_3$  E. NH$_2$

22. A compound contains, by mass, 26.7% carbon, 71.1% oxygen and the remainder hydrogen. A 0.23 mole sample of this compound weighs 20.7 g. What is the molecular formula of this compound?
A. C$_3$H$_6$O$_2$  B. C$_2$H$_4$O  C. C$_2$H$_2$O$_4$  D. CH$_2$O  E. C$_3$OH

23. The complete combustion of a 0.2864-g sample of a compound yielded 0.420 g of CO$_2$ and 0.172 g of H$_2$O. The molecular weight was determined to be approximately 60 g/mol. What is the molecular formula of this compound if it contains only carbon, hydrogen, and oxygen?
A. C$_2$H$_4$O$_2$  B. CH$_2$O  C. CH$_4$O$_2$  D. C$_3$H$_6$O$_3$  E. C$_9$H$_{38}$O$_{19}$

24. What is the ratio of the masses of oxygen that combine with 1.00 gram of lead in the compounds PbO, PbO$_2$, and Pb$_2$O$_3$?

25. What mass of fluoristan, SnF$_2$, would contain the same mass of tin as 306 grams of cassiterite, SnO$_2$?
A. 295 g  B. 318 g  C. 278 g  D. 367 g  E. 335 g

26. How do nonmetals form negative ions?
A. by losing one or more electrons  B. by sharing electrons  C. by gaining one or more electrons  D. by gaining one or more protons

27. Which one of the following formulas represents a polyatomic ion?
A. NO$_2$  B. RbNO$_2$  C. Rb$^+$  D. NO$_3$^-

28. Calculate the percentage of nitrogen, N, in dinitrogen trioxide, N$_2$O$_3$.
A. 40%  B. 36.8%  C. 18.4%  D. 46.7%