Final Exam Review

Project 5

Determine the best answers for the questions below. Always round appropriately.

1. Which of the following correctly represents the nuclide having 13 protons, 13 electrons, and 14 neutrons?

   a. $^{27}_{13}Al$

   b. $^{14}_{13}Al$

   c. $^{13}_{27}Co$

   d. $^{27}_{14}Si$

   e. none of these

2. A sample of 18-karat gold is composed of the following by mass: 18.0 g gold, 3.0 g silver, and 3.0 g copper. What is the percent gold?

   a. 6.0% b. 18% c. 25% d. 33% e. 75%

3. How many valence electrons are present in a Group IIA/2 element?

   a. 2 b. 3 c. 4 d. 5 e. none of these

4. What is the coefficient of hydrogen gas after balancing the following equation?

   $N_2(g) + H_2(g) \text{-----} > NH_3(g)$

   a. 1 b. 2 c. 3 d. 4 e. 5

5. What compound is formed between the chromium (III) and oxide ions?

   a. Cr_3O_2 b. Cr_6O_6 c. Cr_1O d. CrO e. none of these

6. What subatomic particle has a mass of ~1 atomic mass unit and a positive charge?

a. alpha particle b. beta particle c. nucleus d. proton e. electron

7. What is the systematic name for N_2O_5?

a. dinitrogen oxide
b. nitrogen oxide
c. nitrogen pentaoxide
d. dinitrogen pentaoxide
e. none of these

8. How would the number 0.002570 be expressed in scientific notation?

a. 2.570×10^3 b. 2.570×10^{-3} c. 25.7×10^{-2} d. 25.7×10^2 e. none of these

9. What is the predicted ionic charge for a sodium ion?

a. 2+ b. 1+ c. 1- d. 2- e. 3-

10. How many total atoms are in a molecule of ammonium phosphate, $(NH_4)_3PO_4$?

a. 13 b. 18 c. 19 d. 20 e. none of these

11. What is the ionic charge for the tin ion in SnS_2?

a. 1+ b. 2+ c. 3+ d. 4+ e. none of these

12. If an automobile engine is 155 in^3, what is the volume in cubic centimeters? (Given 1 inch = 2.54 cm exactly)

a. 394 cm^3 b. 1000 cm^3 c. 2540 cm^3 d. 61.0 cm^3 e. 9.45 cm^3

13. What is the chemical formula for chromic acid?

a. H_2CrO_4 (aq)
b. H_2Cr (aq)
c. $HCrO_4$ (aq)
d. H_3CrO_4 (aq)
e. none of these

14. What type of chemical reaction is illustrated in Question 4?

a. combination
b. decomposition
c. single-replacement
d. double-replacement
e. neutralization

15. How many significant digits are in the mass measurement 1.2550×10^2 grams?

a. 1 b. 2 c. 3 d. 4 e. none of these

16. Calculate the mass of hydrogen from the reaction of 2.70 g of aluminum metal as shown in the reaction below.

$$Al(s) + HCl(aq) \rightarrow AlCl_3(aq) + H_2(g)$$

a. 0.202 g b. 0.606 g c. 0.135 g d. 0.303 g e. 0.101 g

17. What types of measurements would be expressed with the following units, respectively?
milliliters, decigrams, pounds per gallon, Kelvin

a. volume, pressure, density, temperature
b. volume, mass, pressure, temperature
c. volume, mass, density, temperature
d. volume, mass, density, pressure
e. none of these

18. Which of the following metals will react with sulfuric acid?
(Hint: Write out the reactions…it will help you answer this question)

a. Ag b. Cu c. Fe d. all of them e. none of them

19. Predict the product of the following reaction…

$Mg\,(s) + O_2\,(g) \text{ -----}>$

a. MgO b. Mg_2O c. MgO_2 d. Mg_2O_3 e. Mg_3O_2

20. What are the products of the following reaction?

$Fe(NO_3)_3\,(aq) + Na_3PO_4\,(aq) \text{ -----}>$

a. FeP and $NaNO_3$
b. $FePO_3$ and $NaNO_3$
c. $FePO_4$ and $NaNO_3$
d. $FePO_4$ and $NaNO_2$
e. no reaction will occur