## Chemistry-575 Semester-1 Review Practice Test (General review with an emphasis on the types of questions missed most frequently by students.)

## Matching

Match each item with the correct statement below.
a. alpha particle
c. gamma radiation
b. beta particle

1. particle of charge -1 and mass equal to that of an electron
$\qquad$ 2. emitted helium nucleus
2. high-energy photons emitted by a radioisotope

Match each item with the correct statement below.
a. fission
b. fusion
4. splitting of nucleus into smaller fragments
5. combination of two nuclei to form a nucleus of greater mass

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
$\qquad$ 6. All of the following are physical properties of matter EXCEPT $\qquad$ .
a. mass
c. melting point
b. color
d. ability to rust
$\qquad$ 7. Which of the following is a heterogeneous mixture?
a. air
c. steel
b. salt water
d. soil
$\qquad$ 8. An example of a homogeneous mixture is $\qquad$ .
a. water
c. noodle soup
b. stainless steel
d. oxygen
$\qquad$ 9. Which of the following is a chemical property?
a. color
c. freezing point
b. hardness
d. ability to react with oxygen
$\qquad$ 10. A student finds the mass and volume of a sample of alcohol. Calculate the density. mass $=79$ grams
volume $=100 \mathrm{ml}$ density $=$ ?
a. $\quad 0.79 \mathrm{~g} / \mathrm{ml}$
b. $\quad 1.3 \mathrm{~g} / \mathrm{ml}$
c. $21 \mathrm{~g} / \mathrm{ml}$
d. $\quad 7900 \mathrm{~g} / \mathrm{ml}$
11. Which sample has the greatest density?
a. 1 gram of aluminum
c. 100 grams of aluminum
b. 10 grams of aluminum
d. all samples of aluminum have the same density
12. As the mass of a sample increases, the volume of the sample $\qquad$ , and the density of the sample $\qquad$ -.
a. increases, increases
c. increases, remains the same
b. increases, decreases
d. decreases, remains the same
13. A student measures the amount sugar in a stick of gum by chewing it up, and spitting it out. The sugar should dissolve while the gum is being chewed. The package said the gum was $74 \%$ sugar. The calculated amount of sugar based on their chewing data was $62 \%$. What was their percent error?
a. 0.16 \%
c. $19 \%$
b. $16 \%$
d. Why would someone mass their chewed gum? (Don't choose this answer!)
14. Neutral atoms become ions when
a. protons are lost or gained
c. electrons are lost or gained
b. neutrons are lost or gained
d. isotopes are lost or gained
$\qquad$ 15. Cations are pawsitive and are formed when atoms $\qquad$ electrons, anions are negative and are formed when atoms $\qquad$ electrons.
a. gain, loose
c. gain, gain
b. lose, gain
d. lose, lose
16. How does a sulfur atom become a sulfide ion with a -2 charge?
a. Sulfur loses 2 protons
c. Sulfur loses 2 electrons
b. Sulfur gains 2 protons
d. Sulfur gains 2 electrons
17. How does a Aluminium atom become a Aluminium ion with a +3 charge?
a. Aluminium loses 3 protons
c. Aluminium loses 3 electrons
b. Aluminium gains 3 protons
d. Aluminium gains 3 electrons
18. The mass number of an element is equal to $\qquad$ .
a. the total number of electrons in the nucleus
b. the total number of protons and neutrons in the nucleus
c. less than twice the atomic number
d. a constant number for the lighter elements
19. How many protons, electrons, and neutrons does an atom with atomic number 50 and mass number 125 contain?
a. 50 protons, 50 electrons, 75 neutrons
b. 75 electrons, 50 protons, 50 neutrons
c. 120 neutrons, 50 protons, 75 electrons
d. 70 neutrons, 75 protons, 50 electrons
20. An atom is made of the following subatomic particles:

Protons: 3
Neutrons: 4
Electrons: 2
The mass is $\qquad$ and the charge is $\qquad$ .
a. $9,+1$
b. $6,+1$
c. $7,-1$
d. $7,+1$
21. If E is the symbol for a fictional element, which two of the following symbols represent isotopes of the same element?

1. ${ }_{10}^{20} \mathrm{E}$
2. ${ }_{11}^{20} \mathrm{E}$
3. ${ }_{9}^{21} \mathrm{E}$
4. ${ }_{10}^{21} \mathrm{E}$
a. 1 and 2
b. 3 and 4
c. 1 and 4
d. 2 and 3
5. The density of aluminum is $2.70 \mathrm{~g} / \mathrm{cm}^{3}$. A student measures the mass of a chunk of aluminum to be 45.2 grams. Calculate the volume of the sample.
a. $\quad 0.0597 \mathrm{~cm}^{3}$
b. $\quad 1.93 \mathrm{~cm}^{3}$
c. $\quad 16.7 \mathrm{~cm}^{3}$
d. $\quad 122 \mathrm{~cm}^{3}$
6. If a wave has a high frequency, it also has $\qquad$ .
a. high wavelength and high energy
b. high wavelength and low energy
c. low wavelength and high energy
d. low wavelength and low energy
7. Light is released when an electron moves from higher energy levels to a lower energy level. The resulting spectrum is a(n) $\qquad$ spectrum.
a. absorption
c. excitation
b. emission
d. lower energy
8. Which element has the electron configuration $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 4 s^{2} 3 d^{4}$ ?
a. Titanium (Ti)
c. Sulfur (S)
b. Chromium (Cr)
d. Selenium (Se)
$\qquad$ 26. Which element has the electron configuration for the sulfide ion $\mathrm{S}^{-2}$ ?
a. $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{2}$
b. $\quad 1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{4}$
c. $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6}$
d. $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 4 s^{2}$
9. Which is the correct electron configuration for the element Molybdenum (Mo)?
a. $\quad 1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 4 s^{2} 3 d^{4}$
b. $\quad 1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 4 \mathrm{~s}^{2} 3 \mathrm{~d}^{10} 4 \mathrm{p}^{6} 5 \mathrm{~s}^{6}$
c. $\quad 1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 4 s^{2} 4 d^{10} 4 p^{6} 5 s^{2} 5 d^{4}$
d. $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 4 s^{2} 3 d^{10} 4 p^{6} 5 s^{2} 4 d^{4}$
10. Which of these elements has 5 valence electrons?
a. Boron (B)
c. Vanadium (V)
b. Rubidium ( Rb )
d. Arsenic (As)


Look above at the diagram of the periodic table. Which region is referred to as the p-block on the diagram?
a. A
c. C
b. B
d. D

30.

Look above at the diagram of the periodic table. Which element has an electron configuration that ends in the third energy level?
a. A
c. C
b. B
d. D
31. All of the following elements are metals except $\qquad$ .
a. aluminum
c. sodium
b. chlorine
d. copper
$\qquad$ 32. Which element is a halogen?
a. bromine
c. sodium
b. lithium
d. potassium
33. Which of the following is a transition metal?
a. gallium
c. aluminum
b. nickel
d. tellurium
34. All Group 1 elements have $\qquad$ .
a. one valence electron
c. unpredictable properties
b. one energy level
d. one electron
35. Horizontal rows of the periodic table are known as $\qquad$ .
a. groups
c. periods
b. families
d. columns
$\qquad$ 36. Columns of the periodic table are known as $\qquad$ .
a. groups
c. similarities
b. periods
d. rows
37. Which of the following is not a characteristic of a metal?
a. lustrous
c. brittle
b. conducts heat
d. flexible
38.


Which region contains the alkaline earth metal family of elements?
a. A
c. C
b. B
d. D
39. Which element is a metalloid?
a. oxygen
c. krypton
b. silicon
d. mercury
40. Which of the following formulas is incorrect?
a. $\mathrm{Al}_{2}\left(\mathrm{SO}_{4}\right)_{3}$
b. $\mathrm{AlOH}_{3}$
c. $\mathrm{Ca}(\mathrm{OH})_{2}$
d. $\left(\mathrm{NH}_{4}\right)_{2} \mathrm{~S}$
41. The correct name for $\mathrm{Fe}_{2} \mathrm{~S}_{3}$ is $\qquad$ .
a. iron(III) sulfide
c. iron(II) sulfide
b. iron sulfide
d. iron(I) sulfide
$\qquad$ 42. Which is the correct formula for the compound formed between beryllium and nitrogen?
a. BeN
b. $\quad \mathrm{Be}_{3} \mathrm{~N}$
c. $\mathrm{Be}_{3} \mathrm{~N}_{2}$
d. $\mathrm{Be}_{2} \mathrm{~N}_{3}$
43. Which is the correct formula for the compound Chromium (II) Nitrate?
a. $(\mathrm{Cr})_{2} \mathrm{NO}_{3}$
b. $\quad \mathrm{Cr}_{2} \mathrm{NO}_{3}$
c. $\mathrm{CrNO}_{2}$
d. $\mathrm{Cr}\left(\mathrm{NO}_{3}\right)_{2}$
44. The least penetrating form of radiation is $\qquad$ .
a. beta radiation
c. alpha radiation
b. gamma radiation
d. X rays
45. What particle is needed to complete this nuclear reaction? ${ }_{86}^{222} \mathrm{Rn} \rightarrow{ }_{84}^{218} \mathrm{Po}+$ $\qquad$
a. $\quad{ }_{2}^{4} \mathrm{He}$
b. ${ }_{-1}^{0} \mathrm{e}$
c. ${ }_{1}^{1} \mathrm{H}$
d. ${ }_{0}^{1} \mathrm{n}$
46. What particle is needed to complete the following nuclear equation? ${ }_{25}^{56} \mathrm{Mn} \rightarrow$ $\qquad$ $+{ }_{-1}^{0} \mathrm{e}$
a. $\quad{ }_{27}^{56} \mathrm{Co}$
b. $\quad{ }_{25}^{27} \mathrm{Mn}$
c. ${ }_{26}^{56} \mathrm{Fe}$
d. ${ }_{24}^{58} \mathrm{Cr}$
47.


A student conducted an experiment to see how many mL of water came from different size blocks of ice. They melted three different blocks.. The first block they chose was a 100 gram block, the second a 200 gram block, the final a 400 gram block. After the blocks were melted they measured the volume using a graduated cylinder.

Based on the description of the experiment, what was the independent variable?
a. the type of material melted
c. the volume of the melted water
b. the mass of the ice blocks
d. cannot be determined
$\qquad$ 48.


A student conducted an experiment to see how many mL of water came from different size blocks of ice.
Based on the graph above, what was the dependent variable?
a. the type of material melted
c. the volume of the melted water
b. the mass of the ice blocks
d. cannot be determined
49.


A student conducted an experiment to see how many mL of water came from different size blocks of ice.
What is the slope of the graph above?
a. $\quad 100 \mathrm{~mL} / 50$ grams
b. $\quad 1 \mathrm{~g} / \mathrm{mL}$
c. $1 \mathrm{~mL} / \mathrm{g}$
d. $150 \mathrm{~mL} / 150 \mathrm{~g}$
_-_ 50 .


What is the most important holiday of the year?
a. Haloween
c. Pi Day
b. Labor Day
d. Mole Day

