# Chemistry Semester 1 Final Exam Review

1. What is a definition of Chemistry?

**Study of matter**

1. Matter includes all of the following EXCEPT:

a. air b. light c. smoke d. water vapor

1. What is matter?

**Something that has mass and takes up space (volume)**

1. A physical change occurs when a

a. peach spoils c. copper bowl tarnishes

b. bracelet turns your wrist green **d. glue gun melts a glue stick**

1. The particles in a solid are

**a. packed closely together** c. constantly in motion

b. very far apart d. able to slide past one another

Of the following groups, 1, 2, 14, 15, 17, 18:

1. Group(s) \_**1, 2**\_\_\_\_\_\_\_ contains only metals
2. Group (s)\_**18**\_\_\_\_\_\_\_\_\_is called a Noble gases
3. Group(s) \_**17**\_\_\_\_\_\_\_\_has 7 electrons on the valence shell
4. Group(s) \_**15**\_\_\_\_\_\_\_\_needs to gain 3 electrons to fill a stable octet
5. Group(s) \_**2**\_\_\_\_\_\_\_\_\_has a 2+ oxidation state
6. Group(s) \_**2**\_\_\_\_\_\_\_\_\_has an electron dot notation of ●X●
7. Using the periodic table, an element similar to carbon would be\_\_14\_\_\_\_\_
8. Based on their location on the periodic table, you could infer that \_\_\_**18/noble gases**\_\_\_\_\_\_are very unreactive
9. The horizontal row on the periodic table is called a(n)\_\_\_**period**\_\_\_\_
10. The vertical column of blocks on the periodic table is called a(n)\_\_**group/family\_\_\_\_\_**
11. The elements on the zigzag line in the periodic table are \_\_**metalloids**\_\_\_\_\_\_\_\_\_\_
12. Which is NOT a property of metal?

a. malleability **c. unreactivity**

b. ability to lose electrons d. ability to conduct heat

1. A volume of 1 cc (cm3) is the same as \_\_\_\_\_**\_1**\_\_\_\_\_\_\_\_\_mL
2. To determine density, the quantities that must be measured are \_ **volume**\_\_\_\_\_\_\_\_\_\_ and \_\_**mass\_\_\_\_\_\_\_\_\_\_\_**
3. The relationship between the mass *m* of a material , its volume *V*, and its density *D* is

a. *V* = *mD* b. *Vm* = *D*  **c. *DV* = *m*** d. *D* + *V* = *m*

28. The density of aluminum is 2.70 g/cm3. The volume of a solid piece of Aluminum is 1.50 cm3. Find the mass **4.05 grams**

1. The density of pure diamond is 3.5 g/cm3. The mass of a diamond is 0.25 g. Find the volume= **0.71 cm3**
2. What statement about density is true?
3. two samples of a pure substance may have different densities if they are different sizes
4. the density of a sample depends on its location on Earth
5. a cylinder is always used to measure the volume
6. **density is a physical property that remains constant for a pure substance**
7. The number of grams equal to 0.5 kg is \_\_**500 g**\_\_\_\_\_\_\_\_\_
8. In a graph the \_\_**independent**\_\_\_\_\_\_ variable is placed on the x axis and the \_\_**dependant**\_\_\_\_\_\_variable is placed on the y axis.
9. The variable that you change in the lab is the \_\_**independent**\_\_\_\_\_\_\_variable. The variable that responds to the change is called the \_\_\_**dependant \_**\_\_\_\_\_\_\_\_\_\_\_\_variable. All other things do not change and are called \_\_**constants**\_\_\_\_\_\_\_
10. At first Dalton thought the atom was \_\_solid, spherical, \_**\_indivisible**\_\_\_\_\_\_\_\_\_\_, then Ruther ford discovered the **\_nucleus**\_\_\_\_\_\_\_\_\_\_ of the atom, then the subatomic particles \_\_**protons\_**\_\_\_\_\_\_\_, \_neutrons\_\_\_\_\_\_\_\_\_\_, and \_**electrons**\_\_\_\_\_\_\_ were discovered
11. The positively charged particle is the \_\_**proton**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ found in the \_\_**nucleus\_\_\_\_\_\_\_\_\_\_\_\_** of the atom
12. The subatomic particle that has about the same mass as the proton, but with no electrical charge, is called a \_\_**neutron**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is found in the \_\_**nucleus**\_\_\_\_\_\_\_ of the atom
13. The \_**\_electron**\_\_\_\_\_\_\_\_\_\_\_\_\_is negatively charged and is found in the \_\_**electron cloud**/outer shell\_\_\_\_\_\_\_\_ of the atom
14. \_\_**Bhor\_\_\_\_\_\_\_\_\_\_\_**is the person credited with placing electrons on levels and \_\_**Schrodinger**\_\_\_\_\_\_\_\_\_\_\_ established the electron cloud theory.
15. The forces that hold the particles together in the nucleus are \_\_**columbic /electrostatic**\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forces
16. Isotopes are atoms of the same element that \_\_**have different number of neutrons**
17. All isotopes of hydrogen contain \_**1 proton & 1 electron**\_\_\_\_\_\_\_\_\_\_\_\_\_
18. What is the atomic number for Nitrogen? **7** To what subatomic particle does this correspond? **# of protons**
19. Zinc –66 has \_\_**30**\_\_\_\_\_\_protons and \_\_\_**36**\_\_\_\_\_\_\_neutrons
20. What is the electron configuration for sodium? **[Ne]3s1**Chlorine? **[Ne] 3s23p5** Neon? **[He] 2s22p6**
21. What is the dot notation for magnesium? Bromine? Argon?
22. How many electrons is each element trying to achieve in the valence level? **8**
23. Which family is entirely radioactive? **Actinides**
24. Which family will gain two electrons to complete their octet? **Group 16**
25. Where are the transition metals located? **Groups 3-12** What is special about their electron configuration that gives them special properties? **They contain d and/or f sublevels**
26. As you move left to right across a period on the table the size (radius) \_\_**decreases**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
27. As you move down a column(group) the ionization energy \_\_**decreases**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
28. The most active metal is \_**Fr\_\_\_\_\_** and the most active nonmetal is \_\_\_\_**H**\_\_\_\_\_\_\_
29. What are the diatomic elements?

**Hydrogen, nitrogen, oxygen, fluorine, bromine, chlorine, iodine**

**Categories of Information to Know:**

1. **States of matter: know the properties/characteristics of solids, liquids, and gases.**
2. **Classification of matter: be able to identify matter as pure substances (elements & compounds) & mixtures (homogenous & heterogeneous)**
3. **Identify physical & chemical properties & physical & chemical changes.**
4. **Calculate p, n, e in neutral atoms, isotopes, & ions.**
5. **Know how to calculate average atomic mass.**
6. **General information in regards to atomic theory – how it has changed over time.**
7. **Be able to write electron configurations.**
8. **Be able to draw electron dot structures**
9. **Be able to predict periodic trends**
10. **Be able to classify metals, nonmetals, & metalloids.**