Magnet Chemistry Exam 2 – Study Guide **(KEY- selected answers)**

**Part 1: Definitions –** Define the following in your own words

1. Atom \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Subatomic particle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Proton \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Neutron \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Electron \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Isotope \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Ion \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Mass number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Atomic Number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. Atomic Mass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. Alpha Decay \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. Beta Decay \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. Gamma radiation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 2: Atoms** – Use your periodic table to answer the following questions.

1. Summarize the history of the atom and the discoveries of each scientist below:
	1. Democritus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Dalton \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. JJ Thompson \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. Rutherford \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	5. James Chadwick \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Describe the models of the atomic atom (including the Plum Pudding & Rutherford’s discovery)
3. Identify the number of subatomic particles:
	1. $$ **P: \_\_\_8\_\_ N: \_\_10\_\_\_ E: \_\_10\_\_\_**
	2. $$ **P: \_\_17\_\_\_ N: \_20\_\_\_\_ E: \_\_18\_\_\_**
	3. $$ **P: \_\_11\_\_\_ N: \_29\_\_\_\_ E: \_\_10\_\_\_ (*At Mass should say 23 & not 40! Ans for N would be 12*)**
	4. $$ **P: \_\_56\_\_\_ N: \_\_30\_\_\_ E: \_\_23\_\_\_**
4. The element carbon exists as two isotopes. Those two isotopes are C-12 (98.89%) and C-13 (1.11%). What is carbon's average atomic mass?
5. The element sulfur exists as 4 different isotopes. Those isotopes are S-32 (95.002%), S-33 (0.76%), S-34 (4.22%), and S-36 (0.014%). What is the average atomic mass for sulfur?
6. Nitrogen-13 has a half-life of 10 minutes. How many grams of this isotope will still be present at the end of three half-lives if you begin with a mass of 28 g?

**28 🡪14 🡪7 🡪3.5g**  (\**this would take 30 min, if asked in the question*)

1. A patient is administered 20 mg of iodine-131. How much of this isotope will remain in the body after 40 days if the half-life for iodine-131 is 8 days?

**After 8 days, 10 mg would remain**

**After 16 days, 5 mg**

**After 24 days, 2.5 mg**

**After 32 days, 1.25 mg**

**After 40 days, 0.63 mg**

*\*4 half-lives, if asked*

*For each of the following, complete the reaction and state the type of decay.*

1.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_