Unit 3A Quiz #1: Atomic Structure

Name: _____

Block: _____ Date: _____

I. Matching: Each scientist may be used <u>once</u> or <u>more than once.</u>

A. Robert Millikan	D. Werner Heisenburg	G. Democritus
B. Louis de Broglie	E. Ernest Rutherford	H. John Dalton
C. James Chadwick	F. J. J. Thompson	İ. Neil Bohr

____1. Credited with discovering the neutron.

____ 2. Proposed the Plum Pudding Model

____ 3. Believed all matter was made of atoms.

____ 4. Proposed the Planetary Model

____ 5. Claimed that elements combine to form compounds.

____ 6. Proposed that electrons orbit the nucleus in fixed energy orbitals.

____ 7. Proved that cathode rays were negatively charged particles

____8. Proposed that electron orbitals have different shapes

____ 9. Experiment proved that positive charged particles were packed in the nucleus

____ 10. Developed First Atomic Theory

_____11. Calculated the charge to mass ratio of an electron

____ 12. Position and the velocity of an object cannot both be measured exactly

____ 13. Performed the Gold Foil Experiment

II. Short Answer and Fill-in-the-Blank.

1. How many neutrons are present in an isotope of ^{50}V?
2. What is the isotopic notation for an atom containing 12 protons, 11 neutrons, and 10 electrons?
3. The atomic number of an atom is equal to the number of _____.
4. Which subatomic particle is located outside the nucleus?
5. Write the complete isotopic notation for a strontium atom with 126 subatomic particles.
6. Explain what isotopes are and draw examples in the space below.

7. Balance the following nuclear equations:

a) $^{222}_{86}Rn \rightarrow {}^{0}_{0}\gamma + \square$

b) $^{150}_{62}Sm \rightarrow \square + {}^{146}_{60}Nd$

c) $^{200}_{80}Hg \rightarrow {}^{0}_{-1}e + \square$

d) $\square \rightarrow {}^{0}_{+1}\beta + {}^{132}_{55}Cs$

8. In order for an atom to be neutral, _____.

9. An isotope with a mass number of 207 and atomic number of 82 would belong to which element?

III. Calculations - **Must show work to earn credit.**

1. Lead has four stable isotopes as shown below. Calculate the average atomic mass to three decimal places.

Isotope	Percent Abundance
^{204}Pb	1.4
^{206}Pb	24.1
^{207}Pb	22.1
^{208}Pb	52.4

2. Thallium exists as two stable isotopes and has an atomic mass of 204.383 amu. Thallium-203 makes up 29.524% of all naturally occurring thallium atoms. Calculate the mass of the other isotope to three sig figs? Show work for your calculation.

3. How many half-lives will it take for 15 g of radioactive Bismuth-210 to decay to *less than 1 grams*?

4. Radon-201 undergoes alpha decay every 7.0 seconds. If a 25.0 gram sample of Radon-201 was tested after 105 seconds, how many half-lives have passed?

5. Actinium-225 decays through alpha decay with a half-life of 10 days. If a 30.0 gram sample experiences three half-life cycles, how many grams are left?