K	C	A	T
21	9	31	16

/77 = %

Name:_____

SCH 3U Test - Subatomic Particles,

Models of the Atom, Percent Composition Calculations

PLEASE CHOSE THE BEST ANSWER TO EACH MULTIPLE CHOICE QUESTION

1. In the late 1800s, experiments using vacuum technology and high voltage led to the discovery of the
a) neutron
b) proton
c) positron
d) electron

2. Which subatomic particles are located in the nucleus of a carbon atom?
a) protons and electrons
b) protons, only
c) neutrons, only
d) protons and neutrons

3. Which subatomic particle is negatively charged?
a) neutron
b) electron
c) proton
d) positron

4. Which total mass is the smallest?
a) the mass of 1 electron plus the mass of 1 proton
b) the mass of 1 neutron plus the mass of 1 electron
c) the mass of 2 neutrons
d) the mass of 2 electrons

5. Which two particles each have a mass approximately equal to one atomic mass unit?
a) proton and electron
b) electron and neutron
c) electron and positron
d) proton and neutron

6. Which statement is true about a proton and an electron?
a) They have different masses and different charges.
b) They have different masses and the same charges.
c) They have the same masses and different charges
d) They have the same masses and the same charges

K	C	A	T
			6

7. Which conclusion was a direct result of the gold foil experiment?

a) An electron has a positive charge and is located inside the nucleus.
b) An atom is composed of at least three types of subatomic particles.
c) An electron has properties of both waves and particles.
d) An atom is mostly empty space with a dense, positively charged nucleus.

8. Which statement best describes electrons?

a) They are negative subatomic particles and are found in the nucleus.
b) They are negative subatomic particles and are found surrounding the nucleus.
c) They are positive subatomic particles and are found surrounding the nucleus.
d) They are positive subatomic particles and are found in the nucleus.

/4

9. Which subatomic particle has no charge?

a) beta particle
b) alpha particle
c) neutron
d) electron

10. Compared to the entire atom, the nucleus of the atom is

a) larger and contains most of the atoms mass
b) smaller and contains little of the atom's mass
c) larger and contains little of the atom's mass
d) smaller and contains most of the atom's mass

11. Write a complete atomic symbol for an atom that has 35 protons and 53 neutrons.

/3

12. For the atomic symbol shown, state the number of each type of subatomic particle for a neutral atom.

$^{251}_{98}Cf$	# of p^+ = _____ # of e^- = _____ # of n = _____

/3

K	C	A	T
			10

13. Complete each nuclear equation and state the type of decay process involved:

$$^{211}_{\ \ }\mathrm{Po} \Rightarrow \ ^{\ \ }_{\ \ } + \ ^{\ \ }_{2} \qquad \_\_\_\_\_ \text{ decay}$$

$$^{214}_{\ \ } \Rightarrow \ ^{\ \ }_{83} + \ ^{\ \ }_{1-} \qquad \_\_\_\_\_ \text{ decay}$$

$$^{\ \ }_{79} \Rightarrow \ ^{207}_{79} + \ ^{\ \ }_{\ \ } \qquad \_\_\_\_\_ \text{ decay}$$

$$^{236}_{\ \ } \Rightarrow \ ^{232}_{\ \ }\mathrm{Th} + \ ^{\ \ }_{\ \ } \qquad \_\_\_\_\_ \text{ decay}$$

$$^{1}_{0}\mathrm{n} + \ ^{258}_{\ \ }\mathrm{Md} \Rightarrow \ ^{126}_{51} + \ ^{\ \ }_{\ \ } + 3\ ^{\ \ }_{\ \ }$$

K	C	A	T
		20	

14. Using this table, place each name that represents a scientist or group of scientists in chronological order (this means in order of oldest to most recent). Then in the second column, indicate the main points or discovery that goes with each model. Point form is preferred. Include in your answer (in the correct location) the name of two fundamental laws and the main points in Dalton's Model.

Alchemists, Bohr, Dalton, Democritus, Empedocles, Rutherford, Thomson

Name	Main Points or Discovery

K	C	A	T
19			

15. Answer these questions two about the Rutherford Gold Foil Scattering experiment. What I have provided is the two main observations for Rutherfords experiment. What I am looking for is conclusion that was reached based on the particular observation.

The vast majority of alpha particles were observed to pass directly through the gold foil as if the goil foil was not even there!!
Conclusion:

The occasional blip was seen suggesting that a few of the alpha particles were deflected or reflected off course:
Conclusion:

/2K

16. Perform a complete percent composition calculation based on chemical formula and periodic table masses. Hint: The table will provide you with an organized space for the FOUR SEPARATE CALCULATIONS REQUIRED, THREE OF WHICH ARE THREE LINE CALCULATIONS THAT START WITH A BLANK FORMULA. – $Au(IO_3)_3$ is the formula

3A

5C

K	C	A	T
2	5	3	

17. Perform an empirical formula calculation for a molecule with the following composition: 46.160% carbon, 5.165% hydrogen and 48.675% fluorine. Complete a molecular formula determination given that the molar mass of the compound is 312.28 g/mol. Use full problem solving format.

		F
8		A
4		C
		K