AP Chemistry Name_____
Modern Electron Theory Test (Form Bose)
Mr. McAfoos Period_____ Date_____

Some of the following items contain statements of introduction as well as questions. Answer the questions. It is NOT necessary to address the statements, unless the question asks about them, or you need to use the ideas in the statements to answer the questions properly. You do NOT need to write complete sentences, although complete thoughts are required. Also, please be sure that you answer the questions that I asked, as opposed to the questions that you wanted me to ask, or the un-asked, but related questions.

1. Although Bohr's theory answered many questions, it left several others. One of those questions was the issue of why electrons are not found in the nucleus. What was Schrödinger's response to this difficulty?

2. What was de Brøglie's equation? What do each of the symbols in the equation stand for? What does the equation mean in English?

3. Einstein argued that the photoelectric effect proved that light was made of particles. Why was it insufficient to state that blue light worked because blue light, with its shorter wavelength had higher energy?

4. Listed below are the 4 quantum numbers. For each, tell me what it is, and what the numerical values can be (in cases where the value of one quantum number depends on the value of another, state what the relationship between the quantum numbers is).
   $n =$
   $l =$
   $m =$
   $m_s =$
5. What the heck are the quantum numbers anyway? Please DO NOT give me the same answer that you did in #4. I want to know what they heck they do, where they come from, what their purpose in life is, etc.

6. Draw all of the orbitals with n=5 and $l < 3$. Be sure to label the axes (plural of axis), the nodes (both radial and angular) and the orbitals themselves.

7. Draw the Ψ v r, Ψ^2 v r and $4\pi r^2 \Psi^2 dr$ v r graphs for n=3, l=0.

8. How does all of this orbital stuff solve the problem of quantum leaping? (Be sure to tell me what the problem with quantum leaping was in the first place.)

9. What is the electron configuration for $_{82}Pb$? The two positive ions of lead that are found in nature are +2 and +4. Why? (Be sure to give the electron configuration of those ions in your answer.) If lead were going to be a negative ion, what would the charge be and why?

10. What are the electron configuration of Au, Au^{+1} and Au^{+3}?

11. Name three ions (at least one positive and at least one negative) that are isoelectronic with Kr.