Chemistry 112 Chapter 6 Exercise: Intro Reading and Questions

Read pp. 154-169, and answer the following questions. <u>Answer in sentence form</u>.

1. Who published the first periodic table, and when? What was the basis for the order of the elements on his table? What was the basis for categorizing the columns or groups of elements on his table?
2. What was a positive thing about his table that made it authentic, and unusual at the time? (Hint: It explains why his name is more famous than Lothar Meyer's; 3rd paragraph p. 156.)
3. His table had a problem. Look at our modern periodic table, and look specifically at the atomic masses of cobalt and nickel; then look at the atomic masses of tellurium and iodine. According to Mendeleev's pattern of arrangement, these elements are out of order. Why?
4. On our modern periodic table (after the work of Henry Moseley), what is the basis for the arrangement/order of the elements? What is the basis for categorizing the columns or groups of elements? Why wasn't Mendeleev able to use these bases/criteria for his table?
5. What are two other words (synonyms) that mean "row" on the periodic table?
6. What are two other words (synonyms) that mean "column" on the periodic table?
7. Write 4 physical properties of metals.
8. Write 4 physical properties of nonmetals.
9. Write down a 2-word phrase that answers the chemical definition of a metal? (Hint: it is all about what they do with electrons when they react.)
10. Write down a 2-word phrase that answers the chemical definition of a of a nonmetal?
11. If hydrogen is a gas, why is it classified as a metal on the periodic table?
12. "*Hydrogen is an exception to almost every rule in chemistry*." Think of what you know about the atomic structure of the hydrogen atom, and the hydrogen ion. What makes H^+ ion so unique?
13. How many metalloids are there? List their symbols.
14. Li, F, Fe, Ca, O, U, Ag, Pb – Copy these symbols, and beside each one list 4 things: 1) period number, 2) group number, 3) area on the periodic table (using the most specific category possible, based on the colour categories on pp. 162-163), and 4) e configuration.
15. Na, Mg, Al, Si, P, S, Cl, Ar – Copy these symbols, and beside each one list 3 things: number of energy levels, number of electrons in outer level, predicted charge for ion when it reacts.
16. a. List the symbol of any 5 elements for which the symbol is the first letter in the name.
    b. List the symbol of any 5 elements for which the symbol is first letter plus one other letter in the name.
    b. List the symbol and name for 5 elements for which the symbol appears to have little or nothing to do with the name.
17. a. How many columns/groups of representative elements are there?
    b. List the group numbers.
    c. What sublevel are the e's filling?
18. a. How many columns/groups of transition metals are there?
    b. List the group numbers.
    c. What sublevel are the e's filling?
19. a. How many columns/groups of rare earth elements (inner transition metals) are there?
    b. Name the 2 rows.
    c. What sublevel are the e's filling?