

PART B: MULTIPLE CHOICE

- _____ 1. When a strontium atom loses two electrons to form an Sr^{2+} ion, the electrons are lost from the
a. 5s orbital b. 5p orbital c. 3d orbital d. 4f orbital
- _____ 2. The element iodine, I, is a
a. Period 5 alkali metal c. period 5 halogen
b. Period 4 halogen d. period 5 transition metal
- _____ 3. The subatomic particle that plays the greatest role in determining the physical and chemical properties of an element is the
a. Proton b. neutron c. electron d. photon
- _____ 4. For which element would you expect a large jump between the first and second ionization energies?
a. F b. Ca c. Fe d. Na
- _____ 5. The category of elements that is characterized by the filling of *f* orbitals is the
a. Inner transition metals c. alkaline earth metals
b. Alkali metals d. transition metals
- _____ 6. Of the following atoms, which one has the smallest first ionization energy?
a. Boron b. aluminum c. nitrogen d. silicon
- _____ 7. The alkali metals do not include
a. Li b. Ca c. Na d. Rb
- _____ 8. The modern periodic table is arranged in order of increasing
a. Atomic mass c. atomic size
b. Atomic number d. atomic radius
- _____ 9. The elements in Groups 1A through 7A are
a. Alkali metals c. transition metals
b. Alkaline earth metals d. representative elements
- _____ 10. Which of the following is true concerning the noble gases?
a. Their highest occupied *s* and *p* sublevels are filled
b. They belong to Group 8A
c. They are sometimes referred to as the inert gas
d. All of the above
- _____ 11. What is the number of electrons in the highest occupied energy level of an element in Group 5A?
a. 5 b. 3 c. 8 d. 18
- _____ 12. Among the groups of elements listed below, which have the same number of electrons in their highest occupied energy levels?
a. Li, B, C, F b. Na, Mg, Al, S c. K, Ca, Rb, Sr d. N, P, As, Sb
- _____ 13. An element that contains an electron in a *d* sublevel is
a. Mg b. O c. Fe d. Ne
- _____ 14. The elements that contain electrons in an *f* sublevel near the highest occupied energy level are referred to as
a. Alkali metals c. transition metals
b. Alkaline earth metals d. inner transition metals
- _____ 15. The electron configuration of the element chlorine ends in
a. $3s^2$ b. $3p^6$ c. $3p^5$ d. $3p^7$
- _____ 16. The element with 8 electrons in its 3d sublevel is
a. O b. Ne c. Ar d. Ni
- _____ 17. As you move down a group in the periodic table, atomic size generally
a. Increases b. decreases c. remains the same d. varies randomly
- _____ 18. The largest atom from among the following is
a. Li b. Na c. Rb d. Fr
- _____ 19. The smallest atom from among the following is
a. Na b. Mg c. Si d. Cl

3. What would be the electron configuration for an aluminum *ion*?
4. How would you describe the dot structure for an atom of oxygen?
5. What are the 7 diatomic molecules? Which one needs a triple bond?
6. What is a lone pair of electrons? Provide an example.

7. Complete the information, referring to the central atom for the following molecular shapes:

Sample Formula	Shape	No. Of Bonded/Shared Pairs	No. Of Lone/Unshared Pairs
AX ₂	linear		
AX ₃	trigonal planar		
AX ₄	tetrahedral		
AX ₃ E	trigonal pyramid		
AX ₂ E ₂	V-shape		

8. Review VSEPR Theory practice questions and handout sheets.