UNIT 5 REVIEW

Circle the letter of the answer that will best complete the statement.

1. The elements in today’s periodic table are arranged according to their ___.
   a. atomic number
   b. atomic mass
   c. electron force
   d. oxidation number

2. Which sequence of elements is arranged in order of decreasing atomic radius?
   a. Al, Si, P
   b. Li, Na, K
   c. Cl, Br, I
   d. N, C, B

3. When a sodium atom becomes an ion, the size of the atom ___.
   a. decreases by gaining an electron
   b. decreases by losing an electron
   c. increases by gaining an electron
   d. increases by losing an electron

4. Elements that readily gain electrons tend to have ___.
   a. high ionization energy and high electronegativity
   b. high ionization energy and low electronegativity
   c. low ionization energy and low electronegativity
   d. low ionization energy and high electronegativity.

5. Compared to atoms of metals, atoms of nonmetals generally have ___.
   a. higher electronegativities and lower ionization energies
   b. higher electronegativities and higher ionization energies
   c. lower electronegativities and lower ionization energies
   d. lower electronegativities and higher ionization energies

6. As the elements in Group 1 of the periodic table are considered from top to bottom, a lower element has
   a ___ than an element higher up the column.
   a. smaller first ionization energy
   b. larger first ionization energy
   c. smaller number of protons
   d. larger number of valence electrons

7. Atoms of metallic elements tend to _____.
   a. gain electrons and form negative ions
   b. gain electrons and form positive ions
   c. close electrons and form negative ions
   d. lose electrons and form positive ions
8. Determine which element would have characteristics of both a metal and a nonmetal:

a. Ag  
b. K  

\[\text{C} \] As  
d. Xe

9. In early efforts to classify the elements, Mendeleev arranged the atoms in order of ___.

a. atomic number  
b. atomic radii  
\[\text{C} \] atomic mass  
d. ionization energies

10. Which of the following atoms has the largest atomic radius?

a. Na  
\[\text{B} \] K  
c. Mg  
d. Ca

11. Determine the group, period and block of an atom with the electron configuration \([\text{Ar}]4s^23d^{10}4p^4\)

a. group 14, period 4, d-block  
b. group 16, period 3, p-block  
c. group 14, period 4, p-block  
\[\text{D} \] group 16, period 4, p-block

12. Moving down a group on the periodic table, which two atomic properties follow the same trend?

a. atomic radius and ionization energy  
b. ionization energy and electronegativity  
c. ionization energy and atomic radius  
d. ionic radius and electronegativity

13. Niobium (Nb) is a(n)

a. nonmetal  
\[\text{B} \] transition element  
c. alkali metal  
d. halogen

14. It can be predicted that element 118 will have properties similar to ___.

a. alkali earth metals  
\[\text{B} \] halogens  
c. metalloids  
d. noble gases

15. When elements are arranged by increasing atomic number, there is a periodic repetition of their chemical and physical properties is known as the ___.

a. octet rule  
\[\text{B} \] periodic law  
c. Aufbau principle  
d. Pauli Exclusion Principle
16. An indication of an atom’s ability to attract electrons to itself during a chemical bond is ____.
   a. ionization energy  
   b. electron affinity  
   c. electronegativity  
   d. electron configuration  

17. The trend in atomic radii as one moves down a group is partially due to ____.
   a. decreased distance of outer electron  
   b. increased charge in the nucleus  
   c. increased number of electrons in the outer energy level  
   d. shielding by the inner electron  

18. Choose the pair in which the second particle listed is larger than the first.
   a. K, Ga  
   b. Pb, C  
   c. Br, Br  
   d. Li, Li⁺  

19. Determine the electron configuration of the element in Group 14 and Period 4 of the periodic table.
   a. [Ne]3s²3p⁴  
   b. [Ar]4s²  
   c. [Ar]4s²3d¹⁰⁴p²  
   d. [Kr]5s²4d²  

20. The ionization energy as one moves from left to right across a period is that it
   a. generally decrease  
   b. generally increase  
   c. remains the same  
   d. varies randomly  

21. The elements in the Lanthanide series are also known as the ____.
   a. alkali metals  
   b. inner transition element  
   c. nonmetals  
   d. alkaline earth metals  

22. Sb is classified as a ____.
   a. metalloid  
   b. noble gas  
   c. metal  
   d. nonmetal  

23. Determine the electron configuration that represents the element with the largest atomic radius
   a. 1s¹  
   b. 1s²2s¹  
   c. 1s²2s²  
   d. 1s²2s²2p¹  

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24. Name the following ionic compounds:

a. BaF₂
   **Barium Fluoride**

b. Al₂O₃
   **Aluminum Oxide**

c. ZnCl₂
   **Zinc Chloride**

d. Ag₂S
   **Silver Sulfide**

e. Zn(MnO₄)₂
   **Zinc Permanganate**

f. La(NO₃)₃
   **Lanthanum Nitrate**

g. Be₃N₂
   **Beryllium Nitride**

h. Na₂SO₄
   **Sodium Sulfate**

i. Mg(OH)₂
   **Magnesium Hydroxide**

j. K₃PO₄
   **Potassium Phosphate**

k. FeCO₃
   **Iron (II) Carbonate**

l. CsClO₄
   **Cesium Perchlorate**

m. Pb₃P₄
   **Lead (IV) Phosphide**

n. Cu₃SO₄
   **Copper (II) Sulfate**

25. Write the chemical formula for each of the following compounds:

a. cesium bromide
   \( \text{CsBr} \)

b. ammonium chlorite
   \( \text{NH}_4\text{ClO}_2 \)

c. copper (II) permanganate
   \( \text{Cu}_2\text{(MnO}_4\text{)}_2 \)

d. chromium (III) carbonate
   \( \text{Cr}_3\text{(CO}_3\text{)}_3 \)

e. gallium arsenide
   \( \text{GaAs} \)

f. silver nitrate
   \( \text{AgNO}_3 \)

g. barium sulfate
   \( \text{BaSO}_4 \)

h. protactinium (IV) nitrite
   \( \text{Pa}_2\text{(NO}_3\text{)}_4 \)

i. tin (II) bicarbonate
   \( \text{Sn}_2\text{(HCO}_3\text{)}_2 \)

j. osmium (IV) chromate
   \( \text{Os}_2\text{(CrO}_4\text{)}_4 \)

k. palladium (IV) perchlorate
   \( \text{Pd}_4\text{(HClO}_4\text{)}_4 \)

l. aluminum cyanide
   \( \text{Al}_3\text{(CN)}_3 \)

m. nickel (II) bromide
   \( \text{NiBr}_2 \)

n. tin (II) fluoride
   \( \text{SnF}_2 \)

o. gallium acetate
   \( \text{Ga}_2\text{(C}_2\text{H}_3\text{O}_2\text{)}_3 \)

p. calcium sulfite
   \( \text{CaSO}_3 \)

q. zinc perchlorate
   \( \text{Zn}_2\text{(ClO}_4\text{)}_2 \)