Unit 3 Exam Review

1. Define valence electrons.
2. How many valence electrons are in atom of:
   A. sulfur (atomic #16)
   B. radon (atomic #86)
   C. cesium (atomic #55)
   D. carbon (atomic #6)?
   E. aluminum (atomic #13)?
   F. arsenic (atomic #33)?
   G. iodine (atomic #53)?
3. How many electrons will a calcium atom (Ca) lose in order to get a noble gas configuration?
4. How many electrons will a phosphorus atom (P) gain in order to get a noble gas configuration?
5. What is the formula for the ion formed when Sr (atomic number 38) loses its valence electrons?
6. What is the formula for the ion formed when oxygen (atomic number 8) obtains a noble gas configuration?
7. In ionic bonds, valence electrons are:
8. In metallic bonding, the valence electrons of all atoms are shared in what way?
9. Bonds between atoms of metals are generally:
10. Bonds between nonmetals and other nonmetals are generally:
11. Bonds between metals and nonmetals are generally:
12. Identify the following bonds as ionic, covalent or metallic:
    A. A bond between nitrogen (atomic #7) and oxygen (atomic #8)
    B. The bond between boron (atomic #5) and silicon (atomic #14)
    C. The bond in between sodium (atomic #11) and oxygen (atomic #8)
    D. The bond between hydrogen (atomic #1) and oxygen (atomic #8)
    E. The bond between lithium (atomic #3) and fluorine (atomic #9)
    F. A bond between potassium (atomic #19) and chlorine (atomic #17)
    G. The bond in between an oxygen atom and another oxygen atom
    H. The bond existing between the atoms of iron (atomic #26) in a piece of iron
13. According to the HONC rule, how many covalent bonds form around hydrogen and the halogens?
14. According to the HONC rule, how many covalent bonds form around nitrogen?
15. Draw the electron-dot notation for the element indium (atomic #49).
16. Identify the following compounds as covalent or ionic.
    A. CaO
    B. NH_3
    C. CH_3Cl
    D. CO_2
    E. KCl
    F. Mg_3N_2
    G. MnO_2
    H. C_2H_5OH
17. Define the octet rule.
18. Draw the Lewis Structure for the diatomic nitrogen molecule (N_2)?
19. Identify an element that has the same Lewis dot structure as phosphorus.
20. In the correct Lewis structure for the methane (CH_4) molecule, how many unshared electron pairs surround the carbon?
21. In the correct Lewis structure for water, how many unshared pairs of electrons will oxygen have?
22. Draw the Lewis structure for chloromethane (CH_3Cl)?
23. When compared to single bonds, double bonds are generally(longer/shorter) and (stronger/weaker).
24. Identify a diatomic elements has a double bond between its atoms?
25. Most ionic compounds form (liquids, molecules, crystals or gases).