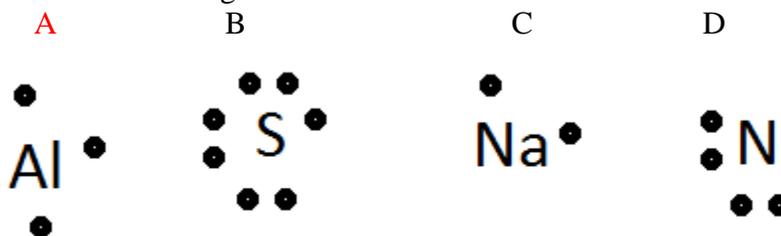


## CP Chem Unit 3 Review **KEY**

1. Which of the following compounds exhibits **ionic** bonding?

- a.  $\text{N}_2$
- b.  **$(\text{NH}_4)\text{Cl}$**
- c.  $\text{N}_2\text{O}$
- d.  $\text{ICl}_3$
- e.  $\text{H}_2\text{O}$

2. Which of the following is a correct electron dot structure?



3. Using the periodic table only, which of the following has the lowest electronegativity?

- a. N
- b. **Si**
- c. P
- d. Cl
- e. O

4. Which of these contains the most **polar covalent bond**?

- a. S-Cl
- b. S-F
- c.  $\text{Rb}^+\text{Cl}^-$
- d. S-S
- e. **P-F**

5. Which of these molecules contains a **non-polar** covalent bond?

- a.  $\text{H}_2\text{O}$
- b.  $\text{CCl}_4$
- c. HF
- d.  $\text{NH}_3$
- e.  **$\text{O}_2$**

6. In the Lewis Dot Structure of  $\text{PH}_3$ , how many single bonds and how many non-bonding (lone) pairs are on the central atom, respectively?

- a. 3,2
- b. 2,1
- c. **3,1**
- d. 1,1
- e. 3,0

7. Which of the following compounds contains a molecule that has a trigonal planar geometry? (Draw all of the Lewis structures!)

- a.  $\text{CBr}_4$
- b.  **$\text{BI}_3$**
- c.  $\text{AsCl}_3$
- d.  $\text{NH}_3$
- e.  $\text{ClF}_3$

8. Which of these atoms can have an expanded octet when bonding?  
a. **Kr**      b. F      c. O      d. C      e. Ne
9. What is the molecular shape of  $\text{CSF}_2$ ? (Carbon is the central atom.)  
a. Bent  
b. **Trigonal planar**  
c. Octahedral  
d. T-shaped  
e. Trigonal pyramidal
10. In what situation is the name of the molecular shape the same as the name of the electronic shape?  
a. When the number of bonded electrons is the same as the number of non-bonded electrons.  
b. When there are only non-bonded electrons on the central atom.  
c. **When there are only bonded electrons on the central atom.**  
d. When the number of bonded electrons is double the number of non-bonded electrons.
11. Which of the following numbers of electron groups (bonded and lone pairs) can give rise to a bent molecule?  
a. 2  
b. 3  
c. 4  
d. 2 and 3  
e. **3 and 4**
12. The **electronic shape** (main shape) of a molecule with four single bonds and 1 lone pair is  
a. See-saw  
b. **Trigonal bipyramidal**  
c. Trigonal pyramidal  
d. T-shaped  
e. Tetrahedral
13. The molecular shape of  $\text{ClBr}_4^-$  is  
a. Trigonal planar  
b. Tetrahedral  
c. See-saw  
d. Octahedral  
e. **Square planar**

14. Which of the following will have at least one  $90^\circ$  bond angle? (Draw the Lewis structures!)

- a.  $\text{BrF}_3$
- b.  $\text{PF}_3$
- c.  $\text{CF}_4$
- d.  $\text{BF}_4^-$
- e.  $\text{CO}_2$

15. Which of the following is a non-polar molecule? (Draw the Lewis Structures!)

- a.  $\text{SeS}_2$
- b.  $\text{XeS}_2\text{I}_2$
- c.  $\text{CO}_2$
- d.  $\text{BBr}_3\text{F}^-$
- e.  $\text{NH}_3$

16. All of the following have a linear molecular geometry. Which of the molecules is polar?

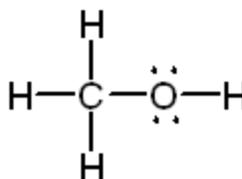
- a.  $\text{NCS}^-$
- b.  $\text{CS}_2$
- c.  $\text{O}_2$
- d.  $\text{H}_2$
- e.  $\text{KrI}_2$

17. What is the molecular shape of  $\text{NO}_2^-$ ? (Draw the Lewis Structure!)

- a. Linear
- b. Trigonal planar
- c. Bent
- d. Trigonal pyramidal
- e. See-saw

18. What is the electronic geometry and molecular geometry around the **oxygen** in the structure to the right, respectively?

- a. Trigonal pyramidal, linear
- b. Tetrahedral, bent
- c. Bent, trigonal planar
- d. Bent, tetrahedral
- e. Trigonal planar, bent



19. Predict the ideal bond angles in FNO using the molecular shape given by VSEPR theory.

- a.  $90^\circ$
- b.  $109.5^\circ$
- c.  $120^\circ$
- d.  $180^\circ$
- e.  $90^\circ$  and  $120^\circ$

20. What is the formula for lithium nitrite?
- $\text{LiNO}_3$
  - $\text{LiNO}_2$**
  - $\text{Li}(\text{NO}_3)_2$
  - $\text{Li}(\text{NO}_2)_2$
  - $\text{Li}_3\text{N}$
21. The substance  $\text{KClO}_3$  is a strong oxidizer used in explosives. What is its name?
- Potassium chloride
  - Potassium (I) chlorate
  - Potassium (I) chlorite
  - Potassium chlorate**
  - Potassium chlorite
22. Which of the following have the correct name and formula listed together?
- $\text{Na}_3\text{N}$ , trisodium mononitride
  - $\text{CaOH}$ , calcium hydroxide
  - $\text{P}_2\text{O}_5$ , diphosphorus tetraoxide
  - $\text{Cr}(\text{CN})_4$ , chromium cyanide
  - $\text{FeCl}_3$ , iron (III) chloride**
23. A red glaze on porcelain can be produced using  $\text{MnSO}_4$ . What is its name?
- Manganese (II) sulfate**
  - Magnesium (II) sulfate
  - Manganese sulfate
  - Manganese sulfide
  - Magnesium sulfite
24. Which of these is an example of metallic bonding?
- $\text{K}_8$**
  - $\text{NaCl}$
  - $\text{Sr}_2\text{O}$
  - $\text{N}_2\text{O}$
  - $(\text{NH}_4)_2\text{O}$