CH 121

General and Inorganic Chemistry
Exam 3
June 13, 2002

Name:_____
(please print)

SSN: * * * - * * -_____
(last 4 digits)

Each question is worth 1 point.
Circle your answer clearly, otherwise no credit will be given.
Circle only one answer. If you circle two or more, you will receive no credit.

1. How many electrons can be described by the set of quantum numbers n = 3, l = 3, m_l = -1, m_s = -1/2?
   e. 0

2. Which of the following has the lowest 1st ionization energy?

   c. Na

3. A measure of the ability of a gaseous atom to acquire an electron to become negatively charged is called its:
   c. electron affinity.

5. Which of the following particles has the largest radius?

   e. N^{3-}

6. Which one of the following atoms has the largest atomic radius?

   c. Ga

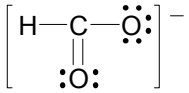
7. Which of the following compounds exhibits ionic bonding?

   b. $MgCl_2$

8. The central atom in the bromite ion BrO_2^- is surrounded by

   a. two bonding and two unshared pair of electrons.

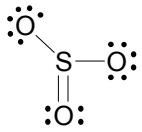
9. What is the average carbon-oxygen bond order in the formate ion?



   c. 1.5

10. Which of the following groups of elements is arranged in order of increasing electronegativity?
    c. P < S < O < F

11. From a consideration of the Lewis structure shown below, what is the formal charge on sulfur in the molecule, SO_3?



    d. 2+

12. What are the oxidation numbers of sulfur and oxygen in the molecule SO_3?

    b. Sulfur is +6 and oxygen is -2.

13. Using the VSEPR theory, predict the molecular shape of ClF_3.

    b. T-shaped

14. How many pi (π) bonds are in the following molecule?

$H_3C-C\equiv C-C\equiv N$

b. 4

15. What type of hybrid orbital set is used by the boron atom in the BCl_4^- ion?

c. sp^3

16. The number of π-bonds in hydrazine, H_2NNH_2 is

a. 0

17. Consider the diatomic molecules of the second period Li_2, Be_2, B_2, and C_2. The two molecules which have the same bond order are

b. Li_2 and B_2

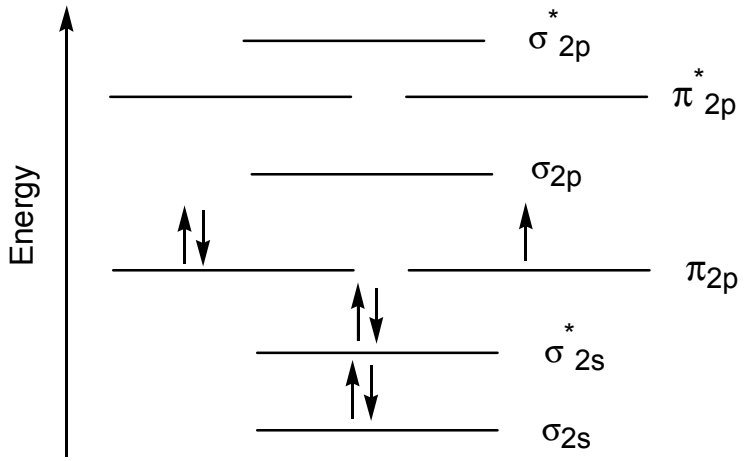
18. The species below having the longest bond (if any) is

d. N_2^{2-}

19. The species below having the shortest bond (if any) is

b. N_2

20. The following molecular orbital energy level diagram is appropriate for which one of the listed particles?



b. B_2^-