1. Which Lewis Dot Formula below is incorrect?
   a. Cl
   b. B
   c. C
   d. Br
   e. Li

2. Which Lewis Dot Formula below is incorrect?
   a. Ca
   b. I
   c. C
   d. N
   e. Al

3. How many unpaired electrons are shown in a Lewis Dot Formula for silicon?
   a. 0  b.1   c.2  d.3  e. 4

4. An atom of which element below has the most unpaired electrons?

5. Which choice below represents the general reaction of the 1A metals with the 7A elements?
   a. 2 M(s) + X → 2 MX(s)  b. M(s) + X → MX(s)  c. M2(s) + X2 → 2 MX(s)
   d. M(s) + X2 → MX2(s)  e. none of these

6. Magnesium and nitrogen react to form Mg₃N₂ an ionic compound. The magnesium ion, Mg²⁺, has ___ electrons in its highest occupied energy level.
   a. 8  b.2   c.10  d.4  e.5

7. What is the charge on the simple (single atom) ion that sulfur forms?
   a. 1⁺  b.2⁺   c.3⁺  d.1⁻  e. 2⁻

8. What is the formula for the binary ionic compound of aluminum and sulfur?
   a. AlS  b. Al₂S  c. Al₂S₂  d. Al₃S₂  e. Al₂S₃

9. Which one of the formulas below is incorrect?
   a. MgCl₂  b. Na₂I  c. InF₃  d. K₂S  e. SrO

10. The ionic solid NaCl is more stable than a mixture of Na and Cl atoms. This is best explained by:
    a. The large, negative crystal lattice energy compensates for the energy lost when forming Na⁺ and Cl⁻.
    b. Both the electron affinity for Cl and the ionization energy for Na are negative values.
    c. The negative value for the electron affinity for Cl is larger than the ionization energy required for Na.
    d. The negative value for the ionization energy required for Na is larger than the electron affinity for Cl.
    e. None of these is the correct explanation.

11. The number of unshared pairs of electrons in the outer shell of sulfur in H₂S is ____.
    a. One  b. two   c. three  d. four  e. zero

12. The total number of covalent bonds in the N₂ molecule is ____.
    a. One  b. two   c. three  d. four  e. zero
13. The number of unshared pairs of electrons in the outer shell of arsenic in AsF₃ is ____.
   a. One    b. two    c. three    d. four    e. zero

14. Assign a formal charge to each atom of ClAsCl:
   a. As = 5+, Cl = 1-
   b. As = 5-, Cl = 7+
   c. As = 0, Cl = 0
   d. As = 4+, Cl = 1-
   e. As = 6+, Cl = 2-

15. Which of the following statements about Lewis structures is false?
   a. Carbon and oxygen may form a double bond.
   b. Any Noble gas involved in a bond must be violating the octet rule.
   c. N, P and As can sometimes share more than 8 e⁻.
   d. H can never make more than one bond.
   e. Quadruple bonds are not possible.

16. Which response lists all the molecules below that have one unshared pair of electrons on the central atom, and no other molecules?
   H₂O, NF₃, BF₃, OF₂
   a. H₂O    b. NF₃    c. NF₃ and OF₂    d. H₂O, NF₃, and OF₂    e. H₂O and NF₃

17. Which one of the following violates the octet rule?
   a. PCl₄⁺    b. ClF    c. CCl₃⁻    d. BCl₃    e. AsCl₃

18. How many resonance structures does the nitrate ion, NO₃⁻, have?
   a. 1    b. 2    c. 3    d. 4    e. 0

19. Which response includes all of the molecules that have nonpolar bonds, and no others?
   Cl₂, BeCl₂, I₂, BrCl, BCl₃
   a. Cl₂, BeCl₂, and I₂    b. Cl₂ and I₂    c. Cl₂, BeCl₂, and BrCl    d. BeCl₂ and BCl₃    e. BrCl

20. The elements of Group VIA may react with each other to form covalent compounds. Which of the following single covalent bonds in such compounds is the most polar bond?
   Electronegativities of the first four Group VIA elements are: F = 4.0, Cl = 3.0, Br = 2.8, I = 2.5
   a. F-F    b. F-Cl    c. F-Br    d. F-I    e. Cl-I

21. Which molecule contains the least polar bonds?
   (Electronegativities: H = 2.1, C = 2.5, F = 4.0, Cl = 3.0, Br = 2.8, I = 2.5)
   a. CF₄    b. CCl₄    c. CBr₄    d. Cl₄    e. CH₄

22. Which molecule would have the weakest dipole moment?
   a. HBr    b. HF    c. HI    d. H₂    e. HCl

23. Which of the following molecules has the most ionic bond character?
   a. NCl₃    b. F₂    c. HF    d. ClF    e. HCl

24. What kind of bond does the transfer of electrons between atoms produce?
   a. nonpolar covalent    b. polar covalent    c. ionic    d. coordinate covalent

25. An ionic bond is most likely to be formed between
   a. a metal of low ionization energy and a nonmetal of low (very positive) electron affinity.
   b. a metal of high ionization energy and a nonmetal of high (very negative) electron affinity.
   c. a metal of high ionization energy and a nonmetal of low (very positive) electron affinity.
   d. a metal of low ionization energy and a nonmetal of high (very negative) electron affinity.
Chapter 7
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 TOP: Lewis Dot Formulas of Atoms
2. ANS: C PTS: 1 DIF: * Harder Question
   TOP: Lewis Dot Formulas of Atoms
3. ANS: C PTS: 1 TOP: Lewis Dot Formulas of Atoms
4. ANS: C PTS: 1 DIF: * Harder Question
   TOP: Lewis Dot Formulas of Atoms
5. ANS: A PTS: 1 TOP: Formation of Ionic Compounds
6. ANS: A PTS: 1 TOP: Formation of Ionic Compounds
7. ANS: E PTS: 1 TOP: Formation of Ionic Compounds
8. ANS: E PTS: 1 TOP: Formation of Ionic Compounds
9. ANS: B PTS: 1 TOP: Formation of Ionic Compounds
10. ANS: A PTS: 1 TOP: Formation of Ionic Compounds
11. ANS: B PTS: 1 TOP: Writing Lewis Formulas: The Octet Rule
12. ANS: C PTS: 1 TOP: Writing Lewis Formulas: The Octet Rule
13. ANS: A PTS: 1 TOP: Writing Lewis Formulas: The Octet Rule
14. ANS: C PTS: 1 TOP: Formal Charge
15. ANS: C PTS: 1
   TOP: Writing Lewis Formulas: Limitations of the Octet Rule for Lewis Formulas
16. ANS: B PTS: 1
   TOP: Writing Lewis Formulas: Limitations of the Octet Rule for Lewis Formulas
17. ANS: D PTS: 1
   TOP: Writing Lewis Formulas: Limitations of the Octet Rule for Lewis Formulas
18. ANS: C PTS: 1 TOP: Resonance
19. ANS: B PTS: 1 TOP: Polar and Nonpolar Covalent Bonds
20. ANS: D PTS: 1 TOP: Polar and Nonpolar Covalent Bonds
21. ANS: D PTS: 1 TOP: Polar and Nonpolar Covalent Bonds
22. ANS: D PTS: 1 TOP: Dipole Moments
23. ANS: C PTS: 1 TOP: The Continuous Range of Bonding Types
24. ANS: C PTS: 1 TOP: Additional Questions
25. ANS: D PTS: 1 TOP: Additional Questions