

Bonding Study Test
Chemistry

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) An ionic bond forms between two atoms through _____.

- A) transferring of electrons from metallic atoms to nonmetallic atoms
- B) each atom acquiring a negative charge
- C) transferring protons from the nucleus of the nonmetal to the nucleus of the metal
- D) sharing of electron pairs

2) How many valence electrons does a tin (Sn) atom have?

- A) 2
- B) 4
- C) 8
- D) 14

3) Which of the following statements about the noble gases is *incorrect*?

- A) All exist in nature as individual atoms rather than molecular form.
- B) All have 8 valence electrons.
- C) They are the most reactive of all gases.
- D) All have very stable electron arrangements.

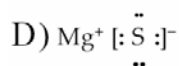
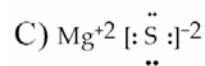
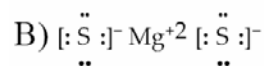
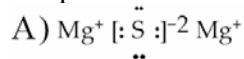
4) Which of the following ions would *not* possess an octet of electrons?

- A) P^{2-}
- B) S^{2-}
- C) Be^{2+}
- D) K^+

5) In the process of forming sodium nitride, Na_3N , each sodium atom _____ electron(s) and each nitride atom _____ electron(s).

- A) loses one; gains two
- B) loses one; gains three
- C) loses three; gains three
- D) loses three; gains one

6) Which Lewis structure below correctly represents the compound formed between magnesium and sulfur?



7) The Lewis model predicts that the formula of a compound formed between bromine and aluminum is:

- A) Al_2Br
- B) $AlBr_3$
- C) $AlBr$
- D) $AlBr_2$

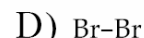
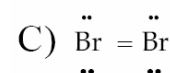
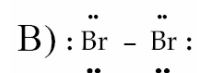
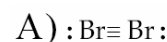
8) When a nonmetal bonds with a nonmetal:

- A) a covalent bond is involved.
- B) a molecular compound forms.
- C) electrons are shared.
- D) all of the above are true
- E) none of the above

9) The Lewis structure for carbon monoxide is $:\text{C}\equiv\text{O}:$. This structures shows:

- A) 2 lone pairs and 3 bonding pairs.
- B) 2 lone pairs and 1 bonding pair.
- C) 4 lone pairs and 3 bonding pairs.
- D) 4 lone pairs and 1 bonding pair.
- E) none of the above

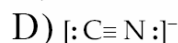
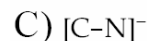
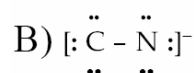
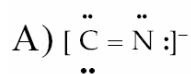
10) What is the correct Lewis structure for Br_2 ?



11) The total number of electrons which would be shown as "dots" in a correctly written Lewis structure for OF_2 is:

- A) 26
- B) 18
- C) 32
- D) 20

12) What is the correct Lewis structure for CN^- ?



- E) none of the above

13) Which set shows the correct resonance structures for SeO_2 ?

- A) $\ddot{\text{O}} = \ddot{\text{Se}} - \ddot{\text{O}} : \leftrightarrow : \ddot{\text{O}} - \ddot{\text{Se}} = \ddot{\text{O}}$
 B) $: \ddot{\text{O}} - \ddot{\text{Se}} - \ddot{\text{O}} : \leftrightarrow \ddot{\text{O}} = \ddot{\text{Se}} = \ddot{\text{O}}$
 C) $: \ddot{\text{O}} = \ddot{\text{Se}} - \ddot{\text{O}} : \leftrightarrow : \ddot{\text{O}} - \ddot{\text{Se}} = \ddot{\text{O}} :$
 D) $: \ddot{\text{O}} = \ddot{\text{Se}} = \ddot{\text{O}} \leftrightarrow : \text{O} \equiv \ddot{\text{Se}} - \ddot{\text{O}} \leftrightarrow : \ddot{\text{O}} - \text{Se} \equiv \text{O} :$

14) What is the angle between electron groups in the linear electron geometry?

- A) 109.5° B) 90° C) 180° D) 120°

15) Which of the following compounds would have a linear molecular geometry?

1. N_2
2. H_2S
3. CO_2

- A) 1,2 and 3 B) 2 and 3 only
 C) 1 and 2 only D) 1 and 3 only
 E) neither 1, 2, or 3

16) What is the molecular geometry of SiH_4 ?

- A) bent B) linear
 C) tetrahedral D) trigonal pyramidal

17) Which term matches the definition: The ability of an element to attract electrons within a covalent bond?

- A) polar covalent B) nonpolar covalent
 C) dipole moment D) coulombic attraction
 E) electronegativity

18) Which molecule listed below has a nonpolar covalent bond?

- A) H_2O B) NaCl
 C) H_2 D) all of the compounds

19) Which term matches the definition: A separation of charge within a bond?

- A) dipole moment
 B) pure covalent
 C) electronegativity
 D) nonpolar covalent
 E) coulombic attraction

20) The electronegativity value for N is 3.0 and that for O is 3.5. Based on these values, which of the following statements is TRUE about the compound NO ?

- A) NO is a pure covalent compound.
 B) NO is a polar covalent compound.
 C) NO is an ionic compound.
 D) There is not enough information to determine the nature of NO .

21) Consider the following electronegativity values:

$\text{H} = 2.1$, $\text{Cl} = 3.0$, $\text{F} = 4.0$

Which molecule below would you expect to have the more polar bond?

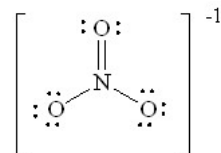
- A) H_2 B) HCl C) F_2
 D) Cl_2 E) HF

22) If the electronegativity difference between two elements X and Y is 0.2, the bond between the two elements would be _____.

- A) nonpolar covalent B) polar covalent
 C) ionic D) coordinate covalent

23) One of the resonance structures for the polyatomic ion NO_3^- is given. How many other resonance structures are there for this ion?

- A) 3 B) 4 C) 1 D) 2



Written Section Practice

Write a Lewis structure for each of the following molecules. Each contains at least one double or triple bond.

- 1 C_2H_4 2 CO 3 O_2

Write a Lewis Structure for each of the following molecules. Then draw the three dimensional structure, and give the molecular geometry name.

- 1 PF_3 2 OF_2 3 HCl
 4 CS_2 5 SiCl_4 6 HCN

Multiple Choice Answers

- 1) A 2) B 3) C 4) A 5) B 6) C 7) B 8) D 9) A 10) B 11) D 12) D 13) A 14) C
 15) D 16) C 17) E 18) C 19) A 20) B 21) E 22) A 23) D