

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

- 1) For a molecule with the formula AB_2 the molecular shape is _____. 1) _____
- A) linear or trigonal planar
 - B) linear or T-shaped
 - C) trigonal planar
 - D) T-shaped
 - E) linear or bent
- 2) According to VSEPR theory, if there are five electron domains in the valence shell of an atom, they will be arranged in a(n) _____ geometry. 2) _____
- A) trigonal bipyramidal
 - B) tetrahedral
 - C) trigonal planar
 - D) linear
 - E) octahedral
- 3) According to VSEPR theory, if there are four electron domains in the valence shell of an atom, they will be arranged in a(n) _____ geometry. 3) _____
- A) tetrahedral
 - B) trigonal bipyramidal
 - C) linear
 - D) octahedral
 - E) trigonal planar
- 4) The electron-domain geometry and molecular geometry of iodine trichloride are _____ and _____, respectively. 4) _____
- A) octahedral, trigonal planar
 - B) T-shaped, trigonal planar
 - C) trigonal bipyramidal, trigonal planar
 - D) tetrahedral, trigonal pyramidal
 - E) trigonal bipyramidal, T-shaped
- 5) The molecular geometry of _____ is square planar. 5) _____
- A) CCl_4 B) XeF_2 C) PH_3 D) ICl_3 E) XeF_4

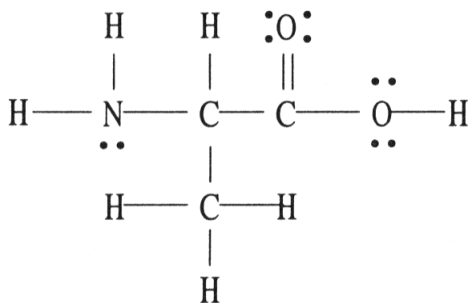
- 6) The molecular geometry of the H_3O^+ ion is _____.
- A) tetrahedral
B) bent
C) octahedral
D) trigonal pyramidal
E) linear
- 7) The molecular geometry of the CS_2 molecule is _____.
- A) tetrahedral
B) trigonal planar
C) bent
D) linear
E) T-shaped
- 8) The molecular geometry of the SiH_2Cl_2 molecule is _____.
- A) tetrahedral
B) T-shaped
C) trigonal planar
D) trigonal pyramidal
E) octahedral
- 9) The molecular geometry of the PHCl_2 molecule is _____.
- A) trigonal planar
B) trigonal pyramidal
C) T-shaped
D) tetrahedral
E) bent
- 10) The molecular geometry of the CHCl_3 molecule is _____.
- A) bent
B) tetrahedral
C) trigonal pyramidal
D) trigonal planar
E) T-shaped

- 11) The molecular geometry of the SF₂ molecule is _____. 11) _____
A) bent
B) octahedral
C) tetrahedral
D) trigonal planar
E) linear
- 12) The molecular geometry of the PF₄⁺ ion is _____. 12) _____
A) octahedral
B) trigonal pyramidal
C) trigonal bipyramidal
D) tetrahedral
E) trigonal planar
- 13) The F-B-F bond angle in the BF₂⁻ ion is approximately _____. 13) _____
A) 180° B) 90° C) 60° D) 109.5° E) 120°
- 14) The Cl-Si-Cl bond angle in the SiCl₂F₂ molecule is approximately _____. 14) _____
A) 180° B) 60° C) 109.5° D) 90° E) 120°
- 15) The F-B-F bond angle in the BF₃ molecule is _____. 15) _____
A) 90° B) 60° C) 180° D) 109.5° E) 120°
- 16) The O-S-O bond angle in SO₂ is slightly less than _____. 16) _____
A) 109.5° B) 60° C) 180° D) 120° E) 90°
- 17) The F-N-F bond angle in the NF₃ molecule is slightly less than _____. 17) _____
A) 180° B) 90° C) 60° D) 109.5° E) 120°
- 18) According to valence bond theory, which orbitals on bromine atoms overlap in the formation of the bond in Br₂? 18) _____
A) 3s B) 3p C) 4s D) 4p E) 3d
- 19) The electron-domain geometry of a sulfur-centered compound is trigonal bipyramidal. The hybridization of the central nitrogen atom is _____. 19) _____
A) sp² B) sp³d C) sp D) sp³d² E) sp³

- 20) The hybridization of orbitals on the central atom in a molecule is sp . The electron-domain geometry around this central atom is _____.
- A) octahedral
B) tetrahedral
C) trigonal planar
D) trigonal bipyramidal
E) linear
- 21) The hybridization of orbitals on the central atom in a molecule is sp^2 . The electron-domain geometry about this central atom is _____.
- A) linear
B) trigonal planar
C) trigonal bipyramidal
D) octahedral
E) tetrahedral
- 22) The hybridization of the carbon atom in carbon dioxide is _____.
- A) sp^3d^2 B) sp^3 C) sp^2 D) sp^3d E) sp
- 23) The hybridization of the central atom in the XeF_4 molecule is _____.
- A) sp^2 B) sp C) sp^3 D) sp^3d^2 E) sp^3d
- 24) The electron-domain geometry of the AsF_6^- ion is octahedral. The hybrid orbitals used by the As atom for bonding are _____ orbitals.
- A) sp^3d B) sp^2 C) sp^3 D) sp^2d^2 E) sp^3d^2
- 25) In order to produce sp^3 hybrid orbitals, _____ s atomic orbital(s) and _____ p atomic orbital(s) must be mixed.
- A) two, two B) two, three C) one, two D) one, one E) one, three
- 26) The angles between sp^2 orbitals are _____.
- A) 90° B) 109.5° C) 120° D) 180° E) 45°
- 27) There are _____ σ and _____ π bonds in the $H_2C=C=CH_2$ molecule.
- A) 4, 2 B) 6, 2 C) 2, 6 D) 6, 4 E) 2, 2
- 28) There are _____ σ and _____ π bonds in the $H-C\equiv C-H$ molecule.
- A) 3 and 2 B) 3 and 4 C) 2 and 3 D) 5 and 0 E) 4 and 3

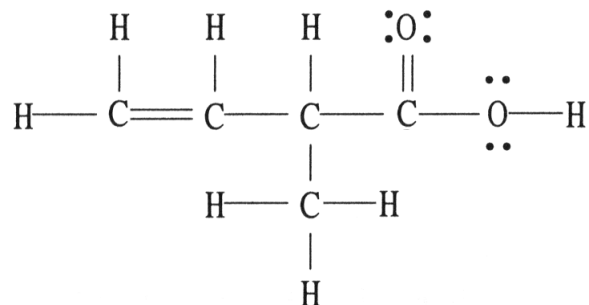
29) The total number of π bonds in the $\text{H}-\text{C}\equiv\text{C}-\text{C}\equiv\text{C}-\text{C}\equiv\text{N}$ molecule is _____. 29) _____
 A) 3 B) 4 C) 6 D) 9 E) 12

30) There is/are _____ σ bond(s) in the molecule below. 30) _____



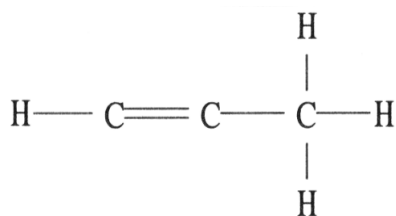
A) 1 B) 2 C) 12 D) 13 E) 18

31) There is/are _____ π bond(s) in the molecule below. 31) _____



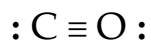
A) 0 B) 1 C) 2 D) 4 E) 16

32) There is/are _____ π bond(s) in the molecule below. 32) _____



A) 6 B) 2 C) 1 D) 0 E) 7

33) The Lewis structure of carbon monoxide is given below. The hybridizations of the carbon and oxygen atoms in carbon monoxide are _____ and _____, respectively. 33) _____



A) sp, sp^3 B) sp^2, sp^2 C) sp, sp D) sp^2, sp^3 E) sp^3, sp^2

Answer Key

Testname: CHAPTER 9

- 1) E
- 2) A
- 3) A
- 4) E
- 5) E
- 6) D
- 7) D
- 8) A
- 9) B
- 10) B
- 11) A
- 12) D
- 13) E
- 14) C
- 15) E
- 16) D
- 17) D
- 18) D
- 19) B
- 20) E
- 21) B
- 22) E
- 23) D
- 24) E
- 25) E
- 26) C
- 27) B
- 28) A
- 29) C
- 30) C
- 31) C
- 32) C
- 33) C