# *Organic Chemistry with Biological Topics 6th edition Smith Test Bank*

SKU: 9781260325294-TEST-BANK

# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

ANSWERS ARE LOCATED IN THE SECOND PART OF THIS DOCUMENT

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

**1)** What is the ground-state electronic configuration of a carbon atom?

1) _____

A) $1s^2, 2s^2, 2p^5$
B) $1s^2, 2s^2, 2p^2$
C) $1s^2, 2s^2, 2p^6$
D) $1s^2, 2s^2, 2p^4$

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.01

**2)** What is the ground-state electronic configuration of a fluorine atom?

2) _____

A) $1s^2, 2s^2, 2p^2$
B) $1s^2, 2s^2, 2p^3$
C) $1s^2, 2s^2, 2p^4$
D) 1s2, 2s2, 2p5

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.01



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**3)** What is the ground-state electronic configuration of a magnesium cation ($Mg^{2+}$)?

3) _____

A) $1s^2, 2s^2, 2p^6$
B) 1s2, 2s2, 2p6, 3s1
C) $1s^2, 2s^2, 2p^6, 3s^2$
D) $1s^2, 2s^2, 2p^6, 3s^2, 3p^2$

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.01

**4)** What is the ground-state electronic configuration of a chlorine anion ($Cl^-$)?

4) _____

A) $1s^2, 2s^2, 2p^6$
B) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6$
C) $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$
D) $1s^2, 2s^2, 2p^6, 3s^2, 3p^4$

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.01

**5)** Which of the following statements about valence electrons is true?

5) _____



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A) They are the most tightly held electrons.
B) They do not participate in chemical reactions.
C) They are the outermost electrons.
D) They reveal the period number of a second-row element.

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.01

**6)** Which of the following atoms will have a full 3s orbital in the ground state?

6) _____

A) Hydrogen
B) Lithium
C) Potassium
D) Rubidium

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.01

**7)** Which of the following statements about bonding is true?

7) _____



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A) Covalent bonds result from the transfer of electrons from one element to another.
B) Ionic bonds result from the transfer of electrons from a metal to a non-metal.
C) Ionic bonds result from the sharing of electrons between two non-metals.
D) Covalent bonds result from the sharing of electrons between two metals.

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation
Section : 01.02

**8)** Which of the following would you expect to have ionic bonds?

8) _____

A) CO
B) FBr
C) $NF_3$
D) NaCl

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 3. Apply
Section : 01.02

**9)** Which of the following molecules has nonpolar covalent bonds?

9) _____



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A) HCl
B) $N_2$
C) $CHCl_3$
D) NO

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.02

**10)** Which of the following molecules contain both covalent and ionic bonds?

| $NaCl$ | $NH_4OH$ | $CH_3OH$ | $MgCO_3$ |
|---|---|---|---|
| I | II | III | IV |

10) _____

A) I, II
B) I, IV
C) II, III
D) II, IV

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 3. Apply
Section : 01.02



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**11)** Which of the following would most likely form an ionic bond?

| C-C | C-N | C-O | Na-O |
|---|---|---|---|
| I | II | III | IV |

11) _____

A) I
B) II
C) III
D) IV

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 3. Apply
Section : 01.02

**12)** Which of the following statements correctly describes the typical number of bonds for carbon, nitrogen, and oxygen in most neutral organic molecules?

12) _____

A) Carbon forms 4 covalent bonds, nitrogen forms 2 covalent bonds, and oxygen forms 3 covalent bonds.
B) Carbon forms 4 covalent bonds, nitrogen forms 3 covalent bonds, and oxygen forms 2 covalent bonds.
C) Carbon forms 4 covalent bonds, nitrogen forms 5 covalent bonds, and oxygen forms 2 covalent bonds.
D) Carbon forms 4 covalent bonds, nitrogen forms 5 covalent bonds, and oxygen forms 4 covalent bonds.

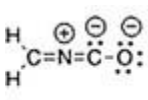


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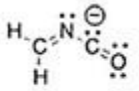
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**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation
Section : 01.02

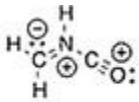
**13)** Which is not an acceptable Lewis structure for the anion CH2NCO−?



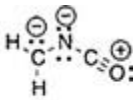
I



II



III



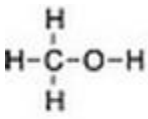
IV

13) _____

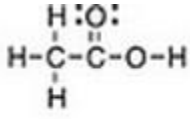
A) I
B) II
C) III
D) IV

**Question Details**
Section : 01.03
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze

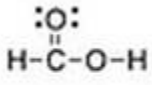
**14)** Which of the following Lewis structures is correct?



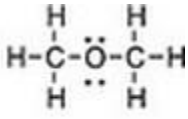
I



II



III



IV

14) _____

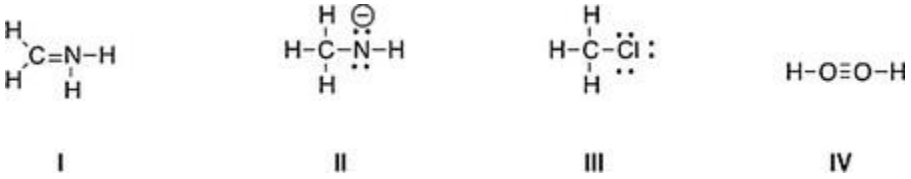


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A) I
B) II
C) III
D) IV

**Question Details**
Section : 01.03
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze

**15)** Which of the following Lewis structures is correct?



I II III IV

15) _____

A) I, II
B) I, III
C) II, III
D) III, IV

**Question Details**
Section : 01.03
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze



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**16)** Which is the correct Lewis structure for acetic acid (CH3CO2H)?



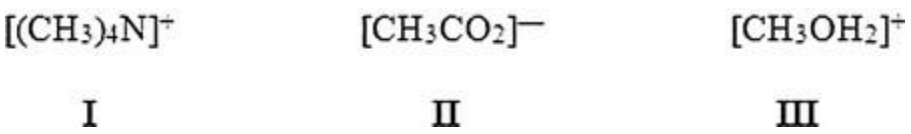
I II III IV

16) _____

A) I
B) II
C) III
D) IV

**Question Details**
Section : 01.03
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze

**17)** In which of the following ions does carbon have a formal charge?



I II III

17) _____

A) I
B) II
C) III
D) None of these

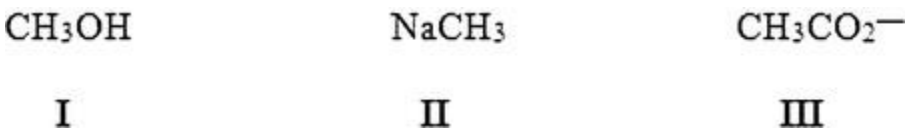


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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**Question Details**
Difficulty : 1 Easy
Section : 01.03
Topic : Structure and Bonding
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation

**18)** In which of the following ions does carbon have a formal charge?



I II III

18) _____

A) I
B) II
C) III
D) None of these

**Question Details**
Difficulty : 1 Easy
Section : 01.03
Topic : Structure and Bonding
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation

**19)** What is the formal charge of carbon in carbon monoxide (CO) when drawn with a triple bond?

19) _____



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A) 0
B) −2
C) −1
D) +1

**Question Details**
Section : 01.03
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze

**20)** What is the formal charge of the carbon in carbon dioxide (CO2) when drawn with two double bonds?

20) _____

A) +1
B) 0
C) −1
D) −2

**Question Details**
Section : 01.03
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze

**21)** Which of the following statements about constitutional isomers is true?

21) _____



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A) Constitutional isomers are different molecules having the different molecular formula.
B) Constitutional isomers are different molecules having the same molecular formula.
C) Constitutional isomers are same molecules having the different molecular formula.
D) Constitutional isomers are same molecules having the same molecular formula.

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation
Section : 01.04

**22)** How many constitutional isomers are there for a molecule having the molecular formula C2H6O?

22) _____

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

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 4. Analyze
Section : 01.04

**23)** How many constitutional isomers are there for a molecule having the molecular formula C3H8O?

23) _____



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

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 4. Analyze
Section : 01.04

**24)** How many constitutional isomers are there for a molecule having the molecular formula C3H6?

24) _____

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

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 4. Analyze
Section : 01.04

**25)** How many constitutional isomers are there for a molecule having the molecular formula C2H4Cl2?

25) _____



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

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.04

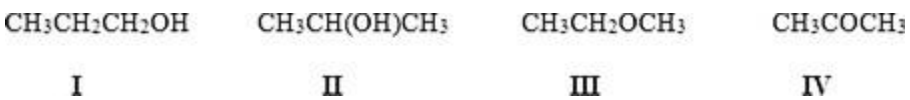
**26)** How many different isomers are there for a compound having the molecular formula C3H6O?

26) _____

A) 4
B) 5
C) 6
D) 7

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.04

**27)** Which of the following molecules are constitutional isomers?




27) _____



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A) I, II, IV
B) II, III, IV
C) I, III, IV
D) I, II, III

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 4. Analyze
Section : 01.04

**28)** Which of the following compounds has an atom with an unfilled valence shell of electrons?

28) _____

A) $H_2O$
B) $BCl_3$
C) $CH_4$
D) $CO_2$

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.05

**29)** Which of the following compounds has an atom with more than eight valence electrons?

29) _____



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A) H2CO3
B) H2SO4
C) H2O
D) HBr

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.05

**30)** How many electrons are around phosphorus in phosphoric acid (H3PO4)?

30) _____

A) 6
B) 8
C) 10
D) 12

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.05

**31)** Which of the following statements about resonance structures is true?

31) _____



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A) Resonance structures have the same placement of electrons but different arrangement of atoms.

B) Resonance structures have the same placement of atoms but different arrangement of electrons.

C) Resonance structures have the same placement of atoms and the same arrangement of electrons.

D) Resonance structures have different placement of atoms and different arrangement of electrons.

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.06

**32)** Which of the following statements about resonance structures is *not* true?

32) _____

A) There is no movement of electrons from one form to another.

B) Resonance structures are not isomers.

C) Resonance structures differ only in the arrangement of electrons.

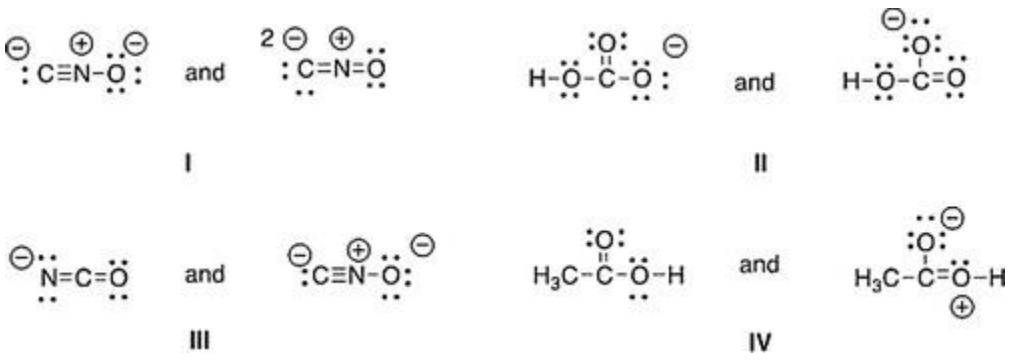
D) Resonance structures are in equilibrium with each other.

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.06



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**33)** Which of the following pair does not represent resonance structures?




33) _____

A) I
B) II
C) III
D) IV

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.06

**34)** What 2 things will change between two resonance structures?

34) _____

A) The position of multiple bonds and non-bonded electrons.
B) The position of multiple bonds and single bonds.
C) The placement of atoms and single bonds.
D) The placement of atoms and non-bonded electrons.

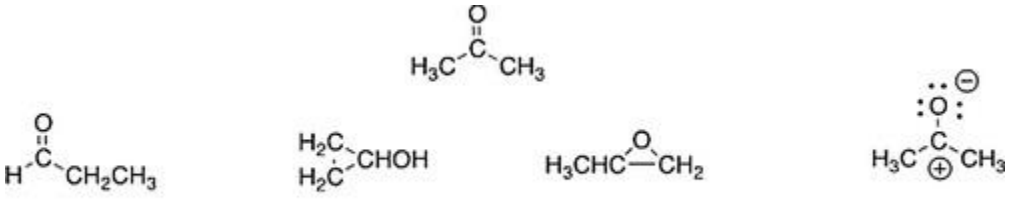


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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**Question Details**
Difficulty : 1 Easy
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.06

**35)** Which of the following is a resonance structure of the compound below?



I II III IV

35) _____

A) I
B) II
C) III
D) IV

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.06
Bloom's : 3. Apply



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**36)** Which of the following resonance structures is the least important contributor to the resonance hybrid of the formate anion, $HCOO^-$?

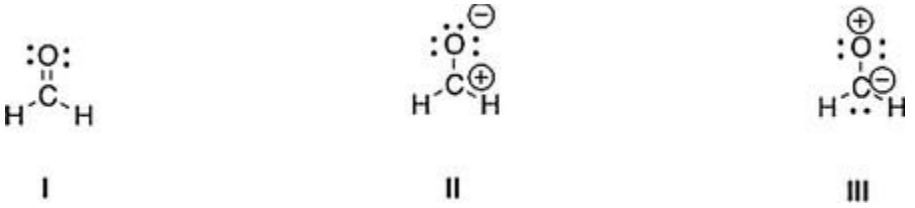



36) _____

A) I
B) II
C) III
D) IV

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 3 Hard
Section : 01.06
Bloom's : 3. Apply

**37)** Rank the following in order of decreasing importance as contributing structures to the resonance hybrid of formaldehyde, $H_2CO$.




37) _____

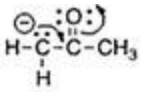


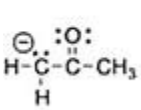
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A) I > II > III
B) I > III > II
C) II > I > III
D) III > II > I

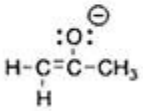
**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 3 Hard
Section : 01.06
Bloom's : 3. Apply

**38)** Follow the curved arrows to draw the second resonance structure for the ion below.

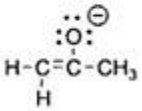




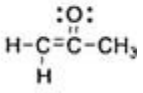
I



II



III



IV

38) _____

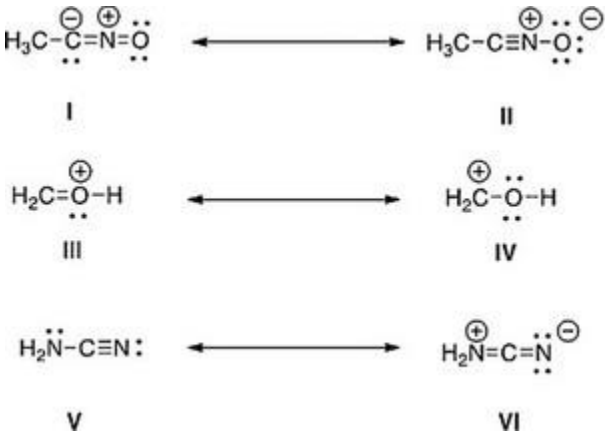
A) I
B) II
C) III
D) IV

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.06



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**39)** Which is more important in each pair of contributing resonance structures?




39) _____

A) II, IV, V
B) II, III, V
C) II, III, VI
D) I, IV, V

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 4. Analyze
Section : 01.06

**40)** What is the approximate value of the H-C-H bond angle in methane, CH4?

40) _____

A) 90°
B) 109.5°
C) 120°
D) 180°



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**Question Details**
Difficulty : 1 Easy
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation
Topic : Molecular Shape
Section : 01.07

**41)** What is the approximate C-C-C bond angle in propene, CH3CH = CH2?

41) _____

A) 90°
B) 109.5°
C) 120°
D) 180°

**Question Details**
Difficulty : 1 Easy
Chapter : 01
Accessibility : Keyboard Navigation
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.07

**42)** What is the approximate H-C-O bond angle in formaldehyde, H2CO?

42) _____

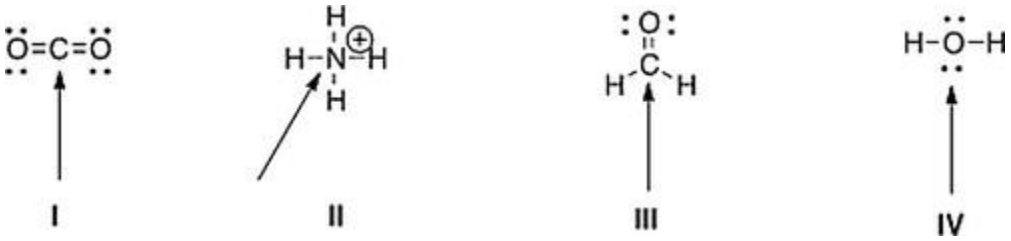
A) 90°
B) 109.5°
C) 120°
D) 180°



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**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.07

**43)** Determine the geometry around the indicated atom in each species.




43) _____

A) I = Linear; II = tetrahedral; III = trigonal planar; IV = tetrahedral
B) I = Linear; II = tetrahedral; III = trigonal planar; IV = linear
C) I = Trigonal planar; II = linear; III = tetrahedral; IV = trigonal planar
D) I = Tetrahedral; II = trigonal planar; III = linear; IV = tetrahedral

**Question Details**
Difficulty : 1 Easy
Bloom's : 1. Remember
Chapter : 01
Accessibility : Keyboard Navigation
Topic : Molecular Shape
Section : 01.07

**44)** What is the approximate bond angle for the C-C-N bond in acetonitrile, CH3CN?

44) _____



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A) 90°
B) 109.5°
C) 120°
D) 180°

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 4. Analyze
Section : 01.07

**45)** What is the molecular geometry around the boron atom in BH3?

45) _____

A) Tetrahedral
B) Trigonal Planar
C) Trigonal Pyramidal
D) Linear

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 4. Analyze
Section : 01.07

**46)** What is the molecular geometry around the carbon atom in CH4?

46) _____

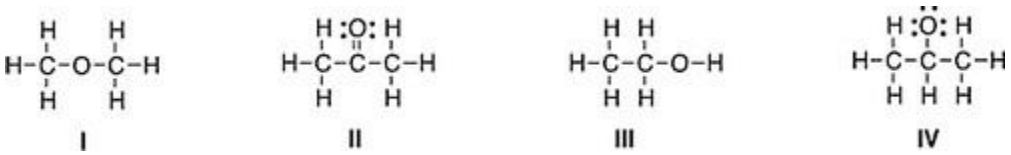


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A) Tetrahedral
B) Trigonal Planar
C) Trigonal Pyramidal
D) Linear

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 4. Analyze
Section : 01.07

**47)** Which of the following is the appropriate conversion of the condensed structure, CH3COCH3, to a Lewis structure?



I II III IV

47) _____

A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.08
Topic : Drawing Organic Molecules



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**48)** Which of the following is the appropriate conversion of (CH3)2CHCH2CHClCH3 to a skeletal structure?




48) _____

A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.08
Topic : Drawing Organic Molecules

**49)** Which of the following is the appropriate conversion of (CH3)4C to a skeletal structure?




49) _____

A) I
B) II
C) III
D) IV

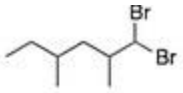


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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**Question Details**
Difficulty : 1 Easy
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 2. Understand
Section : 01.08
Topic : Drawing Organic Molecules

**50)** What is the condensed formula of the compound below?




$CH_3CH_2CH(CH_3)CH_2CH(CH_3)CHBr_2$

I

$CH_3CH_2CH_2(CH_3)CH_2CH(CH_3)CHBr_2$

II

$CH_3CH_2CH(CH_3)CH(CH_3)CH_2CHBr_2$

III

$CH_3CH_2CH(CH_3)CH_2(CH_3)CHCHBr_2$

IV

50) _____

A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.08
Topic : Drawing Organic Molecules



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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**51)** Which of the following is the appropriate conversion of (CH3)2CHOCH2CH2CH2OH to a skeletal structure?



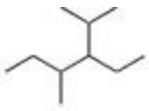
I II III IV

51) _____

A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.08
Topic : Drawing Organic Molecules

**52)** Convert the following skeletal structure to a condensed structure.



$CH_3CH_2CH(CH_3)CH(CH_2CH_3)CH(CH_3)_2$

I

$CH_3CH_2CH(CH_3)_2CH(CH_2CH_3)CH(CH_3)_2$

II

$CH_3CH(CH_2CH_3)CH(CH_2CH_3)CH(CH_3)_2$

III

$CH_3CH(CH_3)CH(CH_2CH_3)CH(CH_3)_2$

IV

52) _____

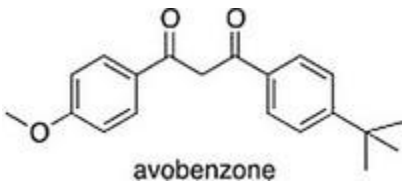


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A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 2. Understand
Section : 01.08
Topic : Drawing Organic Molecules

**53)** Avobenzone is an active ingredient in some common sunscreens. Which of the following is the correct molecular formula for avobenzone?



avobenzone

53) _____

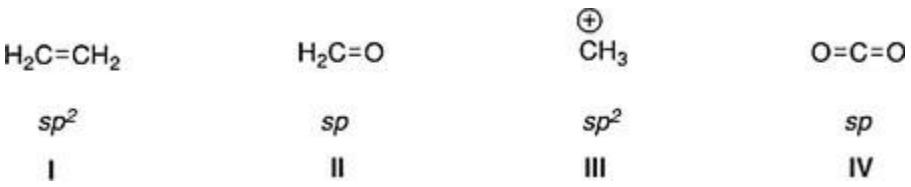
A) C22O22O3
B) C20H22O3
C) C21H23O3
D) C20H24O3

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Bloom's : 3. Apply
Section : 01.08
Topic : Drawing Organic Molecules



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**54)** In which structure is the hybridization incorrect?

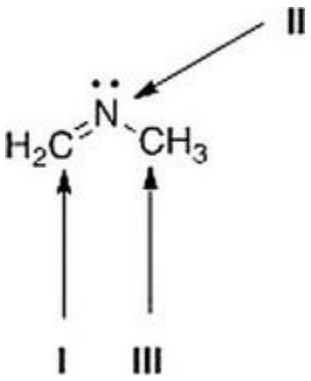



54) _____

A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.09

**55)** What is the hybridization for each of the indicated atoms in the following compound?




55) _____



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A) I = *sp2*; II = *sp2*; III = *sp2*.
B) I = *sp2*; II = *sp3*; III = *sp3*.
C) I = *sp*; II = *sp2*; III = *sp3*.
D) I = *sp2*; II = *sp2*; III = *sp3*.

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.09

**56)** What is the hybridization of the carbon atom in the methyl cation, (CH3+)?

56) _____

A) *sp3*
B) *sp2*
C) *sp*
D) *p*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.09

**57)** What is the hybridization of the nitrogen atom in the ammonium cation, NH4+?

57) _____



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A) *sp3*
B) *sp2*
C) *sp*
D) *p*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.09

**58)** Which atomic orbitals overlap to form the C-H *s* bonding molecular orbitals of ethane, CH3CH3?

58) _____

A) C*sp2* + H1*s*
B) C*sp3* + H1*s*
C) C2*p* + H1*s*
D) C*sp* + H1*s*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.10

**59)** Which atomic orbitals overlap to form the C-H *s* bonding molecular orbitals of ethylene, H2C=CH2?

59) _____



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A) C2*p* + H1*s*
B) C*sp* + H1*s*
C) C*sp3* + H1*s*
D) C*sp2* + H1*s*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.10

**60)** Which atomic orbitals overlap to form the carbon-carbon *s* and *p* bonding molecular orbitals of ethylene, H2C=CH2?

60) _____

A) C*sp3* + C*sp3*, and C2*p* + C2*p*
B) C*sp3* + C*sp3*, and C*sp2* + C*sp2*
C) C*sp2* + C*sp2*, and C2*p* + C2*p*
D) C*sp2* + C*sp2*, and C*sp2* + C*sp2*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.10

**61)** Which atomic orbitals overlap to form the C-H *s* bonding molecular orbitals of acetylene, C2H2?

61) _____



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A) C*sp* + H1*s*
B) C2*p* +H1*s*
C) C*sp3* + H1*s*
D) C*sp2* + H1*s*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.10

**62)** Which atomic orbitals overlap to form the carbon-carbon *s* bonding molecular orbital of acetylene, C2H2?

62) _____

A) C*sp2* + C*sp2*
B) C*sp* + C*sp*
C) C*sp3* + C*sp3*
D) C2*p* + C2*p*

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.10

**63)** When forming molecular orbitals from atomic orbitals, what is the order of increasing C-H bond strength for the following set?

$sp^3$ $sp^2$ $sp$
I II III



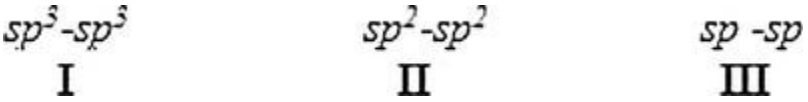
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63) _____

A) II < I < III
B) III < I < II
C) III < II < I
D) I < II < III

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.11

**64)** What is the order of decreasing bond length for a C-C bond composed of the following molecular orbitals?




64) _____

A) I > III > II
B) I > II > III
C) III > II > I
D) II > III > I

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 3. Apply
Section : 01.11

**65)** Which of the following statements about electronegativity and the periodic table is true?



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65) _____

A) Electronegativity decreases across a row of the periodic table.
B) Electronegativity increases down a column of the periodic table.
C) Electronegativity increases across a row of the periodic table.
D) Electronegativity does not change down a column of the periodic table.

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 2. Understand

**66)** Rank the following atoms in order of increasing electronegativity, putting the least electronegative first.

| S | Cl | F | N |
|---|---|---|---|
| I | II | III | IV |

66) _____

A) I < II < III < IV
B) I < IV < II < III
C) III < II < IV < I
D) I < II < IV < III

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 3. Apply



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**67)** Rank the following atoms in order of decreasing electronegativity, putting the most electronegative first.

| Si | N | O | C |
|---|---|---|---|
| I | II | III | IV |

67) _____

A) I > IV > II > III
B) II > III > IV > I
C) III > IV > II > I
D) III > II > IV > I

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 3. Apply

**68)** Which molecule has the greatest difference in electronegativity (DE) between the two different elements?

68) _____

A) $CO_2$
B) $H_2S$
C) $NH_3$
D) $H_2O$

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 3. Apply



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**69)** Which compound contains the most polar bond?

| $CH_3SH$ | $CH_3OH$ | $CH_3Cl$ | $CH_3NH_2$ |
|---|---|---|---|
| I | II | III | IV |

69) _____

A) I
B) II
C) III
D) IV

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 3. Apply

**70)** Which of the following compounds are non-polar?

| $CO_2$ | $NH_3$ | $H_2O$ | $BCl_3$ |
|---|---|---|---|
| I | II | III | IV |

70) _____

A) I, IV
B) I, II
C) II, III
D) II, IV



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**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Section : 01.13
Bloom's : 3. Apply

**71)** Which of the following molecules has non-polar covalent bonds?

71) _____

A) CO2
B) N2
C) CCl4
D) HF

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 2. Understand

**72)** Which of the following molecules has polar covalent bonds?

72) _____

A) MgO
B) NH3
C) Cl2
D) NaBr



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**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 2. Understand

**73)** Which of the following covalent bonds has the largest dipole moment?

73) _____

A) C-H
B) C-C
C) C-O
D) H-F

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 3. Apply

**74)** Which of the following molecules has the smallest dipole moment?

74) _____

A) $CO_2$
B) HCl
C) $H_2O$
D) $NH_3$



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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Section : 01.12
Topic : Molecular Shape
Bloom's : 2. Understand

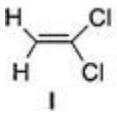
**75)** Which of the following molecules does *not* have a net dipole moment of zero?

75) _____

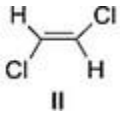
A) CCl4
B) BF3
C) CO2
D) NH3

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Bloom's : 2. Understand
Section : 01.13

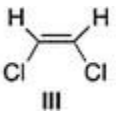
**76)** Which of the following molecules has a net dipole moment of zero?



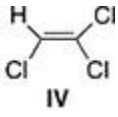
I



II



III



IV

76) _____

A) I
B) II
C) III
D) IV

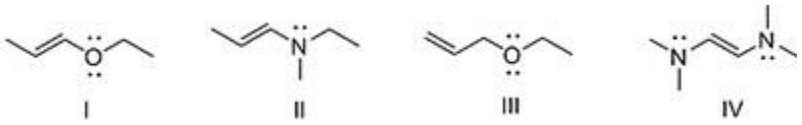


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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Section : 01.13
Bloom's : 4. Analyze

**77)** Consider compounds which contain both a heteroatom and a double bond. For which compound is no additional Lewis structure possible?




77) _____

A) I
B) II
C) III
D) IV

**Question Details**
Topic : Structure and Bonding
Chapter : 01
Accessibility : Keyboard Navigation
Bloom's : 4. Analyze
Difficulty : 3 Hard
Section : 01.06

**78)** Which of the following molecules has a net dipole moment of zero?

78) _____

A) $CH_4$
B) $CO_2$
C) $BH_3$
D) All of these are correct.



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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01

**Question Details**
Chapter : 01
Accessibility : Keyboard Navigation
Difficulty : 2 Medium
Topic : Molecular Shape
Section : 01.13
Bloom's : 4. Analyze



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# Organic Chemistry with Biological Topics 6th Edition by Smith CH01
# Answer Key

Test name: CH01

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



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26) D
27) D
28) B
29) B
30) C
31) B
32) D
33) C
34) A
35) D
36) B
37) A
38) C
39) B
40) B
41) C
42) C
43) A
44) D
45) B
46) A
47) B
48) B
49) D
50) A
51) D
52) A
53) B
54) B
55) D



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56) B
57) A
58) B
59) D
60) C
61) A
62) B
63) D
64) B
65) C
66) B
67) D
68) D
69) B
70) A
71) B
72) B
73) D
74) A
75) D
76) B
77) C
78) D



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