

# Test Bank for Organic Chemistry with Biological Topics 6th Smith

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# 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)  $1s^2, 2s^2, 2p^5$

## 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 ( $\text{Mg}^{2+}$ )?  
3) \_\_\_\_\_

- A)  $1s^2, 2s^2, 2p^6$
- B)  $1s^2, 2s^2, 2p^6, 3s^1$
- 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 ( $\text{Cl}^-$ )?  
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) \_\_\_\_\_

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

- 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<sub>3</sub>
- 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) \_\_\_\_\_

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

- A) HCl
- B) N<sub>2</sub>
- C) CHCl<sub>3</sub>
- 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<sub>4</sub>OH

CH<sub>3</sub>OH

MgCO<sub>3</sub>

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

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

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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## Question Details

Difficulty : 1 Easy

Topic : Structure and Bonding

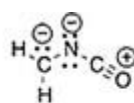
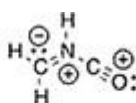
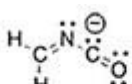
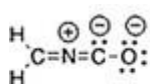
Bloom's : 1. Remember

Chapter : 01

Accessibility : Keyboard Navigation

Section : 01.02

13) Which is not an acceptable Lewis structure for the anion  $\text{CH}_2\text{NCO}^-$ ?



13) \_\_\_\_\_

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

## Question Details

Section : 01.03

Topic : Structure and Bonding

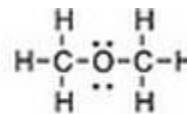
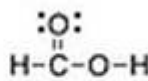
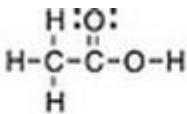
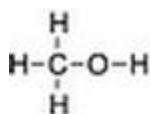
Chapter : 01

Accessibility : Keyboard Navigation

Difficulty : 2 Medium

Bloom's : 4. Analyze

14) Which of the following Lewis structures is correct?



14) \_\_\_\_\_



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

## Question Details

Section : 01.03

Topic : Structure and Bonding

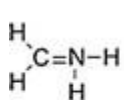
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Accessibility : Keyboard Navigation

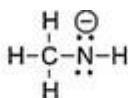
Difficulty : 2 Medium

Bloom's : 4. Analyze

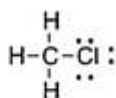
15) Which of the following Lewis structures is correct?



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

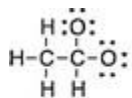
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Difficulty : 2 Medium

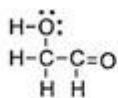
Bloom's : 4. Analyze

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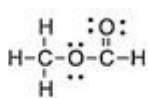
16) Which is the correct Lewis structure for acetic acid ( $\text{CH}_3\text{CO}_2\text{H}$ )?



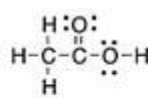
I



II



III



IV

16) \_\_\_\_\_

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

## Question Details

Section : 01.03

Topic : Structure and Bonding

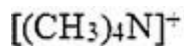
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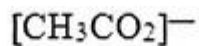
Difficulty : 2 Medium

Bloom's : 4. Analyze

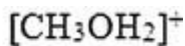
17) In which of the following ions does carbon have a formal charge?



I



II



III

17) \_\_\_\_\_

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

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## Question Details

Difficulty : 1 Easy

Section : 01.03

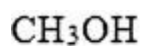
Topic : Structure and Bonding

Bloom's : 1. Remember

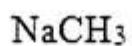
Chapter : 01

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 (CO<sub>2</sub>) 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  $C_2H_6O$ ?

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  $C_3H_8O$ ?

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  $C_3H_6$ ?

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  $C_2H_4Cl_2$ ?

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  $C_3H_6O$ ?

26) \_\_\_\_\_

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

## Question Details

Topic : Structure and Bonding

Chapter : 01

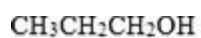
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Difficulty : 2 Medium

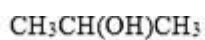
Bloom's : 4. Analyze

Section : 01.04

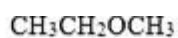
27) Which of the following molecules are constitutional isomers?



I



II



III



IV

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<sub>2</sub>O
- B) BCl<sub>3</sub>
- C) CH<sub>4</sub>
- D) CO<sub>2</sub>

## 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)  $\text{H}_2\text{CO}_3$
- B)  $\text{H}_2\text{SO}_4$
- C)  $\text{H}_2\text{O}$
- D)  $\text{HBr}$

## 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 ( $\text{H}_3\text{PO}_4$ )?

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) \_\_\_\_\_

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

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

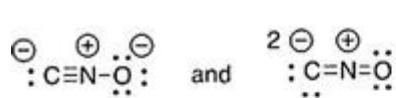
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Bloom's : 2. Understand

Section : 01.06

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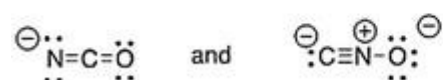
33) Which of the following pair does not represent resonance structures?



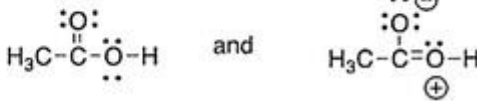
I



II



III



IV

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.

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

## Question Details

Difficulty : 1 Easy

Topic : Structure and Bonding

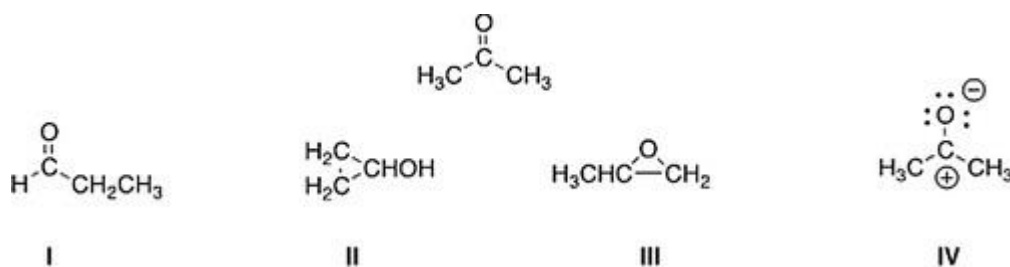
Chapter : 01

Accessibility : Keyboard Navigation

Bloom's : 2. Understand

Section : 01.06

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



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

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

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



36) \_\_\_\_\_

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

## Question Details

Topic : Structure and Bonding

Chapter : 01

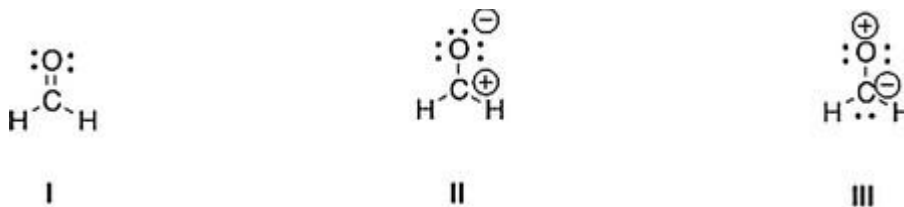
Accessibility : Keyboard Navigation

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,  $\text{H}_2\text{CO}$ .



37) \_\_\_\_\_

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

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

## Question Details

Topic : Structure and Bonding

Chapter : 01

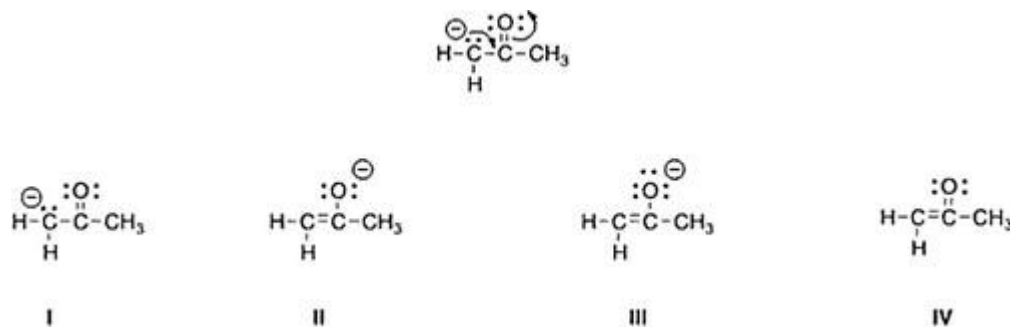
Accessibility : Keyboard Navigation

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.



38) \_\_\_\_\_

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

## Question Details

Topic : Structure and Bonding

Chapter : 01

Accessibility : Keyboard Navigation

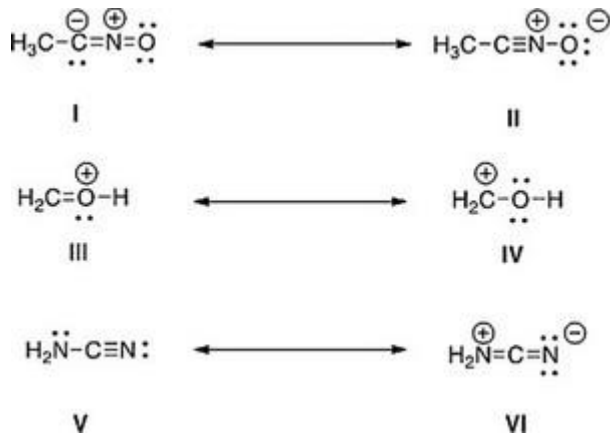
Difficulty : 2 Medium

Bloom's : 2. Understand

Section : 01.06

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

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, CH<sub>4</sub>?

40) \_\_\_\_\_

- A) 90°
- B) 109.5°
- C) 120°
- D) 180°

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

## 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,  $\text{CH}_3\text{CH}=\text{CH}_2$ ?

41) \_\_\_\_\_

- A)  $90^\circ$
- B)  $109.5^\circ$
- C)  $120^\circ$
- D)  $180^\circ$

## 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,  $\text{H}_2\text{CO}$ ?

42) \_\_\_\_\_

- A)  $90^\circ$
- B)  $109.5^\circ$
- C)  $120^\circ$
- D)  $180^\circ$



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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

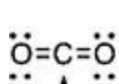
Difficulty : 2 Medium

Topic : Molecular Shape

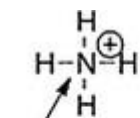
Bloom's : 2. Understand

Section : 01.07

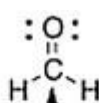
43) Determine the geometry around the indicated atom in each species.



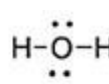
I



II



III



IV

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,  $\text{CH}_3\text{CN}$ ?

44) \_\_\_\_\_

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

- A)  $90^\circ$
- B)  $109.5^\circ$
- C)  $120^\circ$
- D)  $180^\circ$

## 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  $\text{BH}_3$ ?

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  $\text{CH}_4$ ?

46) \_\_\_\_\_

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

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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

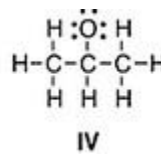
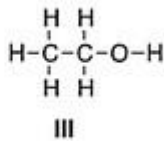
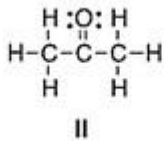
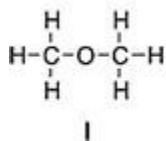
Difficulty : 2 Medium

Topic : Molecular Shape

Bloom's : 4. Analyze

Section : 01.07

47) Which of the following is the appropriate conversion of the condensed structure,  $\text{CH}_3\text{COCH}_3$ , to a Lewis structure?



47) \_\_\_\_\_

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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

Difficulty : 2 Medium

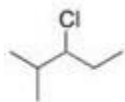
Bloom's : 2. Understand

Section : 01.08

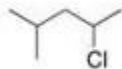
Topic : Drawing Organic Molecules

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

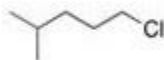
48) Which of the following is the appropriate conversion of  $(\text{CH}_3)_2\text{CHCH}_2\text{CHClCH}_3$  to a skeletal structure?



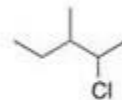
I



II



III



IV

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  $(\text{CH}_3)_4\text{C}$  to a skeletal structure?



I



II



III



IV

49) \_\_\_\_\_

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

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

## Question Details

Difficulty : 1 Easy

Chapter : 01

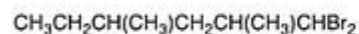
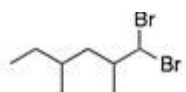
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Bloom's : 2. Understand

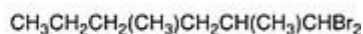
Section : 01.08

Topic : Drawing Organic Molecules

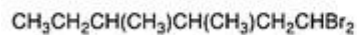
50) What is the condensed formula of the compound below?



I



II



III



IV

50) \_\_\_\_\_

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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

Difficulty : 2 Medium

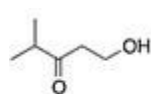
Bloom's : 2. Understand

Section : 01.08

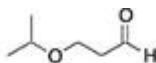
Topic : Drawing Organic Molecules

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

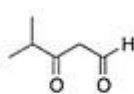
51) Which of the following is the appropriate conversion of  $(\text{CH}_3)_2\text{CHOCH}_2\text{CH}_2\text{CH}_2\text{OH}$  to a skeletal structure?



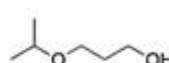
I



II



III



IV

51) \_\_\_\_\_

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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

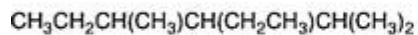
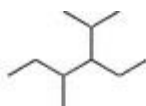
Difficulty : 2 Medium

Bloom's : 2. Understand

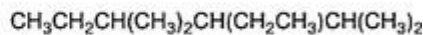
Section : 01.08

Topic : Drawing Organic Molecules

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



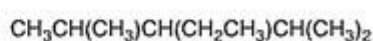
I



II



III



IV

52) \_\_\_\_\_

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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

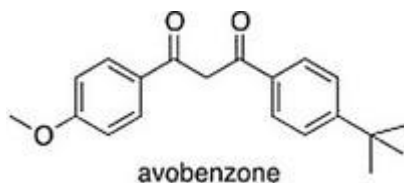
Difficulty : 2 Medium

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?



53) \_\_\_\_\_

- A) C<sub>22</sub>O<sub>22</sub>O<sub>3</sub>
- B) C<sub>20</sub>H<sub>22</sub>O<sub>3</sub>
- C) C<sub>21</sub>H<sub>23</sub>O<sub>3</sub>
- D) C<sub>20</sub>H<sub>24</sub>O<sub>3</sub>

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

Difficulty : 2 Medium

Bloom's : 3. Apply

Section : 01.08

Topic : Drawing Organic Molecules

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

54) In which structure is the hybridization incorrect?



54) \_\_\_\_\_

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

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

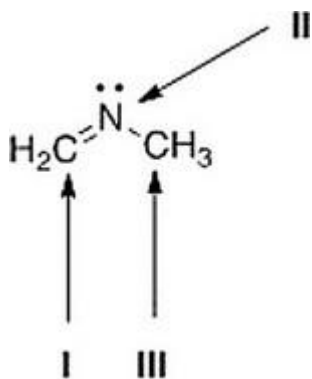
Difficulty : 2 Medium

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) \_\_\_\_\_



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

- A) I =  $sp^2$ ; II =  $sp^2$ ; III =  $sp^2$ .
- B) I =  $sp^2$ ; II =  $sp^3$ ; III =  $sp^3$ .
- C) I =  $sp$ ; II =  $sp^2$ ; III =  $sp^3$ .
- D) I =  $sp^2$ ; II =  $sp^2$ ; III =  $sp^3$ .

## 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,  $(CH_3^+)$ ?

56) \_\_\_\_\_

- A)  $sp^3$
- B)  $sp^2$
- 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,  $NH_4^+$ ?

57) \_\_\_\_\_

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

- A)  $sp^3$
- B)  $sp^2$
- 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,  $\text{CH}_3\text{CH}_3$ ?

58) \_\_\_\_\_

- A)  $\text{C}sp^2 + \text{H}1s$
- B)  $\text{C}sp^3 + \text{H}1s$
- C)  $\text{C}2p + \text{H}1s$
- D)  $\text{C}sp + \text{H}1s$

## 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,  $\text{H}_2\text{C}=\text{CH}_2$ ?

59) \_\_\_\_\_

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

- A)  $C2p + H1s$
- B)  $Csp + H1s$
- C)  $Csp^3 + H1s$
- D)  $Csp^2 + H1s$

## 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,  $H_2C=CH_2$ ?

60) \_\_\_\_\_

- A)  $Csp^3 + Csp^3$ , and  $C2p + C2p$
- B)  $Csp^3 + Csp^3$ , and  $Csp^2 + Csp^2$
- C)  $Csp^2 + Csp^2$ , and  $C2p + C2p$
- D)  $Csp^2 + Csp^2$ , and  $Csp^2 + Csp^2$

## 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,  $C_2H_2$ ?

61) \_\_\_\_\_

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

- A)  $Csp + H1s$
- B)  $C2p + H1s$
- C)  $Csp^3 + H1s$
- D)  $Csp^2 + H1s$

## 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,  $C_2H_2$ ?

62) \_\_\_\_\_

- A)  $Csp^2 + Csp^2$
- B)  $Csp + Csp$
- C)  $Csp^3 + Csp^3$
- D)  $C2p + C2p$

## 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?

$sp^3$   
I

$sp^2$   
II

$sp$   
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

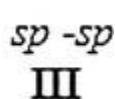
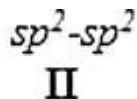
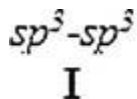
Difficulty : 2 Medium

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?

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

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  
I

Cl  
II

F  
III

N  
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

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

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) \_\_\_\_\_

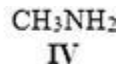
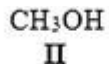
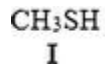
- A) CO<sub>2</sub>
- B) H<sub>2</sub>S
- C) NH<sub>3</sub>
- D) H<sub>2</sub>O

## 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?



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?



70) \_\_\_\_\_

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



# 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 : 3. Apply

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

71) \_\_\_\_\_

- A) CO<sub>2</sub>
- B) N<sub>2</sub>
- C) CCl<sub>4</sub>
- 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) NH<sub>3</sub>
- C) Cl<sub>2</sub>
- D) NaBr

# 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

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<sub>2</sub>
- B) HCl
- C) H<sub>2</sub>O
- D) NH<sub>3</sub>

# 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)  $\text{CCl}_4$
- B)  $\text{BF}_3$
- C)  $\text{CO}_2$
- D)  $\text{NH}_3$

## Question Details

Chapter : 01

Accessibility : Keyboard Navigation

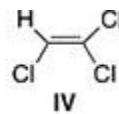
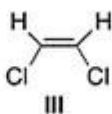
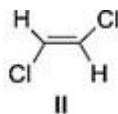
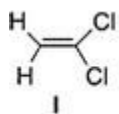
Difficulty : 2 Medium

Topic : Molecular Shape

Bloom's : 2. Understand

Section : 01.13

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



76) \_\_\_\_\_

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

# 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<sub>4</sub>
- B) CO<sub>2</sub>
- C) BH<sub>3</sub>
- D) All of these are correct.

# 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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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