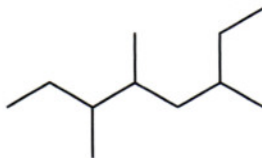
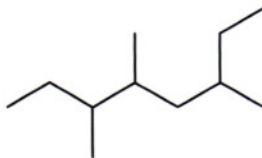
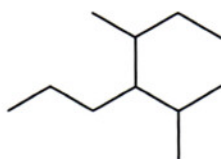
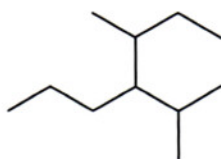


1. How many alkanes of formula C_7H_{16} possess a quaternary carbon atom?
 A) 1
 B) 2
 C) 3
 D) 4
 E) 5

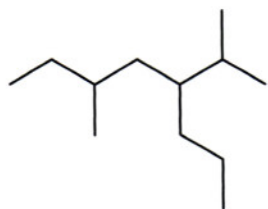


2. The IUPAC name for  is:
 A) 6-Ethyl-3,4-dimethylheptane
 B) 2-Ethyl-4,5-dimethylheptane
 C) 3,4,6-Trimethyloctane
 D) 3,5,6-Trimethyloctane
 E) 2-(1-Methylpropyl)-4-methylhexane



3. An IUPAC name for  is:
 A) 5-Methyl-4-(1-methylpropyl)hexane
 B) 2-Methyl-3-(1-methylpropyl)hexane
 C) 2-Methyl-3-(2-methylpropyl)hexane
 D) 3-Methyl-4-(1-methylethyl)heptane
 E) 5-Methyl-4-(1-methylethyl)heptane

4. A correct IUPAC name for the following compound is:



- A) 2,5-Dimethyl-3-propylheptane
- B) 3,6-Dimethyl-5-propylheptane
- C) 6-Methyl-4-(1-methylethyl)octane
- D) 2-Methyl-3-(2-methylbutyl)hexane
- E) 3-Methyl-5-(1-methylethyl)octane

5. Which of these is the common name for the 1,1-dimethylpropyl group?

- A) tert-Butyl
- B) tert-Pentyl
- C) Isopentyl
- D) Neopentyl
- E) sec-Pentyl

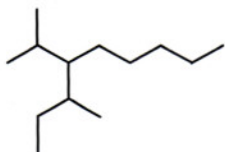
6. An IUPAC name for the group $\begin{array}{c} \text{CH}_3\text{CHCH}_2- \\ | \\ \text{CH}_2\text{CH}_3 \end{array}$ is:

- A) Isopentyl
- B) Isoamyl
- C) sec-Butylmethyl
- D) 2-Methylbutyl
- E) 2-Ethylpropyl

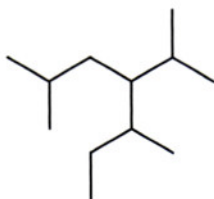
7. The neopentyl group has the alternative name:

- A) 1,1-Dimethylpropyl
- B) 1,2-Dimethylpropyl
- C) 2,2-Dimethylpropyl
- D) 1-Methylbutyl
- E) 2-Methylbutyl

8. What is a correct name for the following compound?



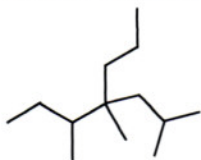
- A) 3-Isobutyl-2-methylheptane
- B) 3-sec-Butyl-2-methyloctane
- C) 5-Isobutyl-6-methylheptane
- D) 2-Ethyl-3-isopropyloctane
- E) 4-Isopropyl-3-methylnonane



9. An IUPAC name for  is:

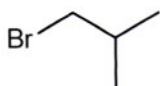
- A) 3-Isobutyl-2,4-dimethylhexane
- B) 3-sec-Butyl-2,5-dimethylhexane
- C) 4-sec-Butyl-2,5-dimethylhexane
- D) 4-Isopropyl-2,5-dimethylheptane
- E) 4-Isopropyl-3,6-dimethylheptane

10. An IUPAC name for the following compound is:



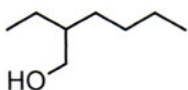
- A) 4-Isobutyl-3,4-dimethylheptane
- B) 4-sec-Butyl-2,4-dimethylheptane
- C) 2,4,5-Trimethyl-4-propylheptane
- D) 3,4,6-Trimethyl-4-propylheptane
- E) 4-Isobutyl-4,5-dimethylheptane

11. What is the common name for this compound?



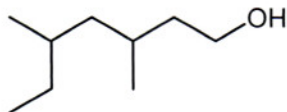
- A) Isobutyl bromide
- B) tert-Butyl bromide
- C) Butyl bromide
- D) sec-Butyl bromide
- E) Bromo-sec-butane

12. What is the correct IUPAC name for the following compound?



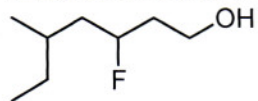
- A) 3-Hydroxymethylheptane
- B) 3-Hydroxymethylhexane
- C) 3-Methoxyheptane
- D) 2-Ethyl-1-hexanol
- E) 2-Ethyl-1-heptanol

13. What is the correct IUPAC name for the following compound?



- A) 5-Ethyl-3-methylhexanol
- B) 5-Ethyl-3-methyl-1-hexanol
- C) 2-Ethyl-4-methyl-6-hexanol
- D) 3,5-Dimethyl-7-heptanol
- E) 3,5-Dimethyl-1-heptanol

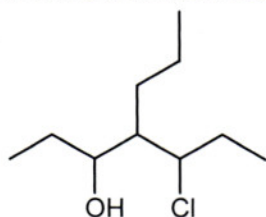
14. What is the correct IUPAC name for the following compound?



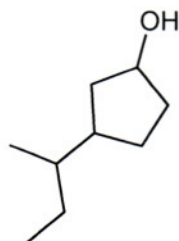
- A) 5-Ethyl-3-fluorohexanol
- B) 5-Ethyl-3-fluoro-1-hexanol
- C) 2-Ethyl-4-fluoro-6-hexanol
- D) 3-fluoro-5-methyl-7-heptanol
- E) 3-fluoro-5-methyl-1-heptanol

15. Which of the following is a correct name which corresponds to the common name tert-pentyl alcohol?
- A) 2,2-Dimethyl-1-propanol
 - B) 2-Ethyl-2-propanol
 - C) 2-Methyl-2-butanol
 - D) 3-Methyl-1-butanol
 - E) Methyl tert-butanol

16. A correct IUPAC name for the following compound is:

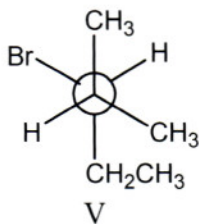
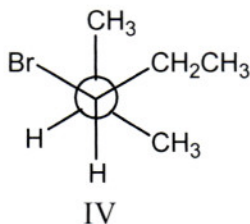
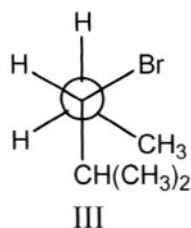
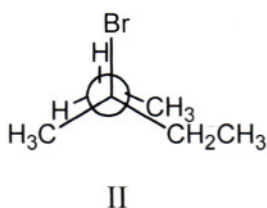
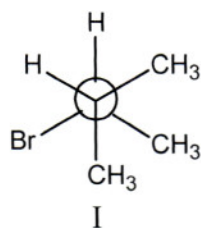


- A) 4-propyl-5-chloro-3-heptanol
 - B) 4-propyl-3-chloro-5-heptanol
 - C) 4-(1-chloropropyl)-3-heptanol
 - D) 5-chloro-4-propyl-3-heptanol
 - E) 3-hydroxy-4-propyl-5-chloroheptane
17. The correct IUPAC name for the following compound is:



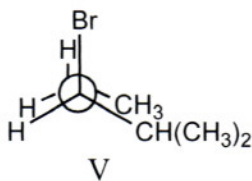
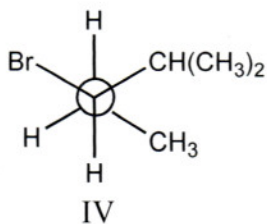
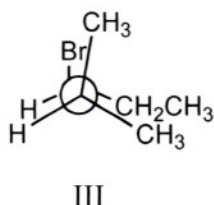
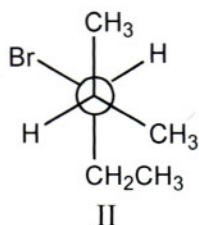
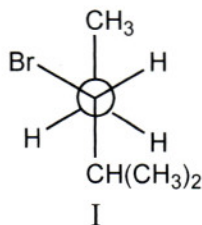
- A) 1-Hydroxy-3-sec-butylcyclopentane
- B) 3-sec-Butyl-1-cyclopentanol
- C) 1-sec-Butyl-3-cyclopentanol
- D) 4-sec-Butyl-1-cyclopentanol
- E) 3-Isobutyl-1-cyclopentanol

18. The most stable conformation of 3-bromo-2-methylpentane, viewed through the C-2—C-3 bond (*i.e.*, C-2 in the front, C-3 in the back):



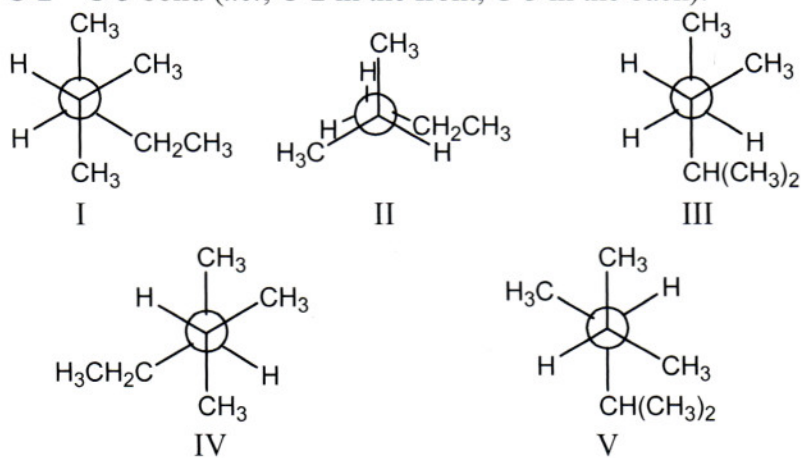
- A) I
B) II
C) III
D) IV
E) V

19. The least stable conformation of 3-bromo-2-methylpentane, viewed through the C-2—C-3 bond (*i.e.*, C-2 in the front, C-3 in the back):



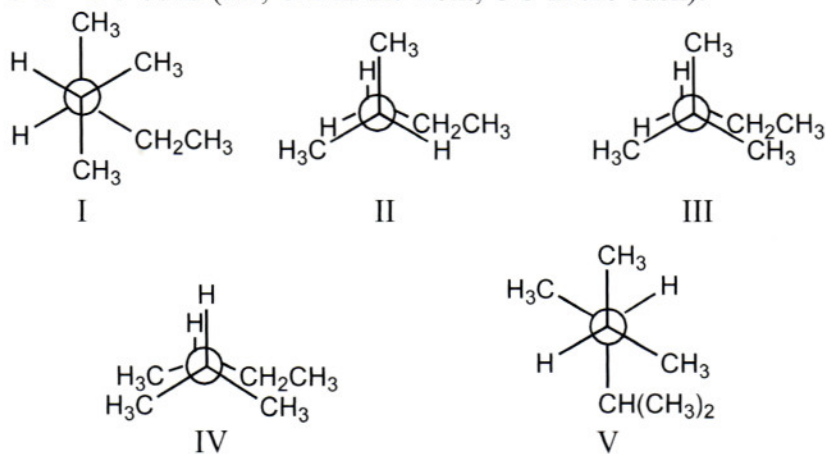
- A) I
B) II
C) III
D) IV
E) V

20. The most stable conformation of 2,3-dimethylpentane, viewed through the C-2—C-3 bond (*i.e.*, C-2 in the front, C-3 in the back):



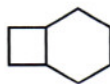
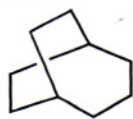
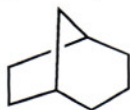
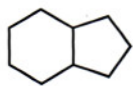
- A) I
 B) II
 C) III
 D) IV
 E) V

21. The least stable conformation of 2,3-dimethylpentane, viewed through the C-2—C-3 bond (*i.e.*, C-2 in the front, C-3 in the back):



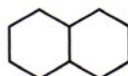
- A) I
 B) II
 C) III
 D) IV
 E) V

22. Which of the following is bicyclo[3.2.2]nonane?



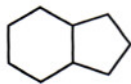
- A) I
- B) II
- C) III
- D) IV
- E) V

23. Which compound is a bicycloheptane?

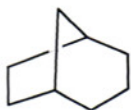


- A) I
- B) II
- C) III
- D) IV
- E) V

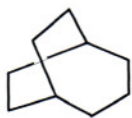
24. Which one is bicyclo[5.2.0]nonane?



I



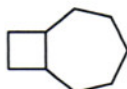
II



III



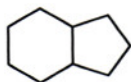
IV



V

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

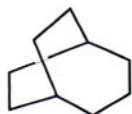
25. Which one is bicyclo[4.3.0]nonane?



I



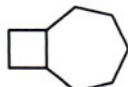
II



III



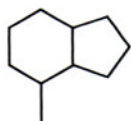
IV



V

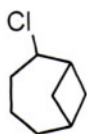
- A) I
- B) II
- C) III
- D) IV
- E) V

26. A correct name for the following compound is:



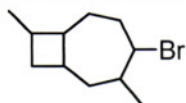
- A) 2-Methylbicyclo[4.3.0]nonane
- B) 1-Methylbicyclo[4.3.1]nonane
- C) 7-Methylbicyclo[4.3.0]nonane
- D) 2-Methylbicyclo[4.3.1]nonane
- E) 1-Methylbicyclo[4.3.0]nonane

27. What is the correct name of the following compound?



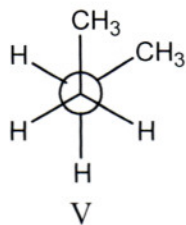
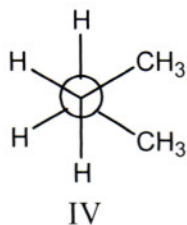
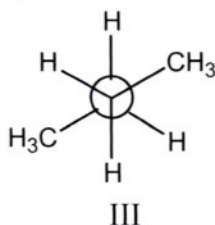
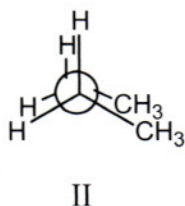
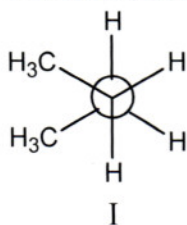
- A) 1-Chlorobicyclo[4.1.1]octane
- B) 2-Chlorobicyclo[4.1.0]octane
- C) 2-Chlorobicyclo[4.1.1]octane
- D) 2-Chlorobicyclo[4.1.1]heptane
- E) 5-Chlorobicyclo[4.1.1]octane

28. A correct name for the following compound is:



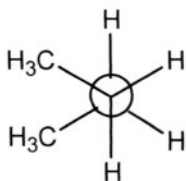
- A) 4-bromo-3,8-dimethylbicyclo[5.2.2]nonane
- B) 3,8-dimethyl-4-bromo-bicyclo[5.2.0]nonane
- C) 4-bromo-3,8-dimethylbicyclo[5.2.1]decane
- D) 7-bromo-2,6-dimethylbicyclo[5.2.0]nonane
- E) 4-bromo-3,8-dimethylbicyclo[5.2.0]nonane

29. The least stable conformation of butane is:

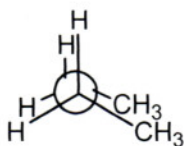


- A) I
- B) II
- C) III
- D) IV
- E) V

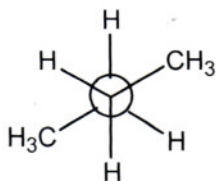
30. The most stable conformation of butane is:



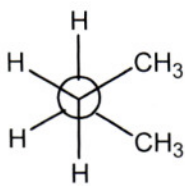
I



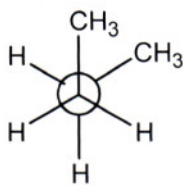
II



III



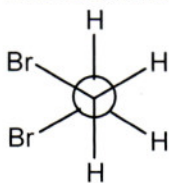
IV



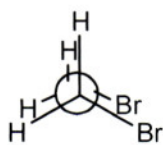
V

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

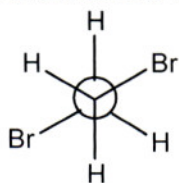
31. The most stable conformation of 1,2-dibromoethane is:



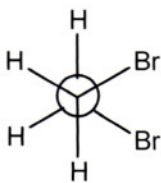
I



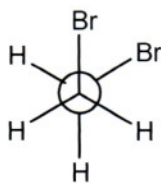
II



III



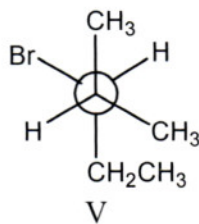
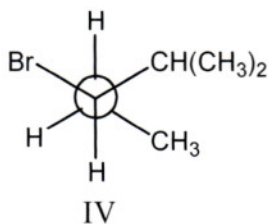
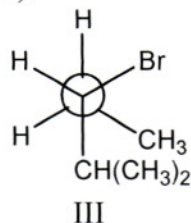
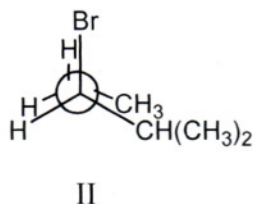
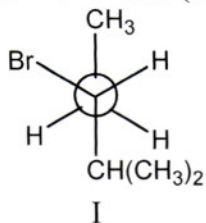
IV



V

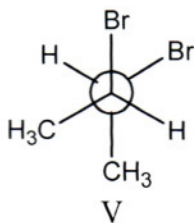
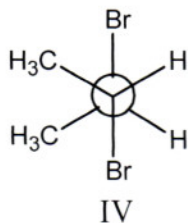
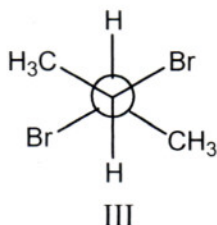
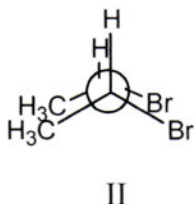
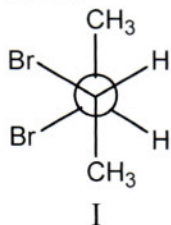
- A) I
- B) II
- C) III
- D) IV
- E) V

32. The most stable conformation of 3-bromo-2-methylpentane, viewed through the C-3—C-4 bond (*i.e.*, C-3 in the front, C-4 in the back):



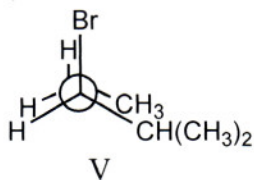
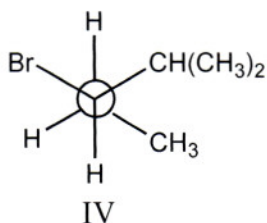
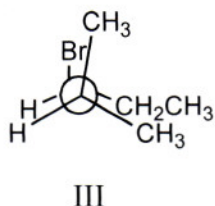
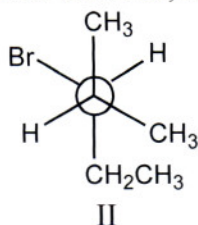
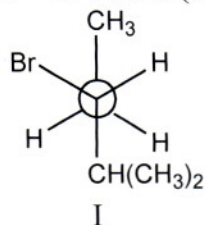
- A) I
- B) II
- C) III
- D) IV
- E) V

33. The most stable conformation of 2,3-dibromobutane, viewed through the C-2—C-3 bond :



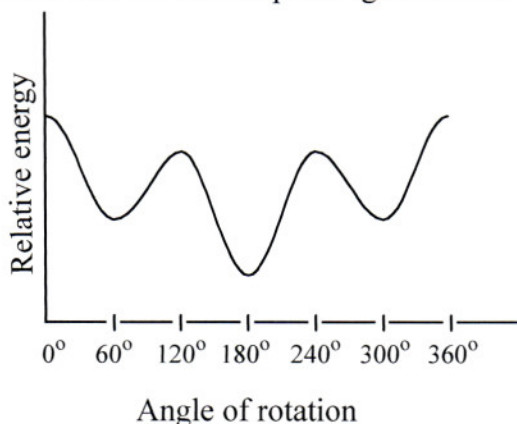
- A) I
- B) II
- C) III
- D) IV
- E) V

34. The least stable conformation of 3-bromo-2-methylpentane, viewed through the C-3—C-4 bond (*i.e.*, C-3 in the front, C-4 in the back):



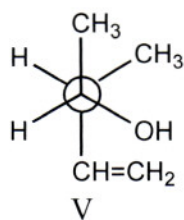
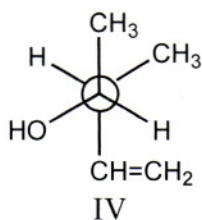
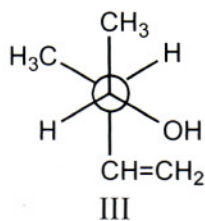
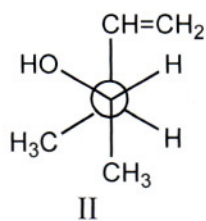
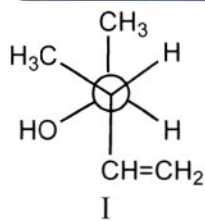
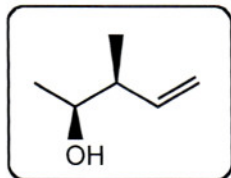
- A) I
 B) II
 C) III
 D) IV
 E) V

35. Consider the graph below, which is a plot of the relative energies of the various conformations of 2,3-dimethylbutane, viewed through the C-2—C-3 bond. The conformations corresponding to the 120° and 240° are:



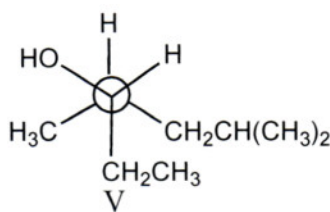
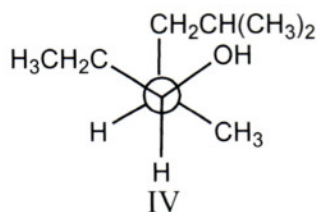
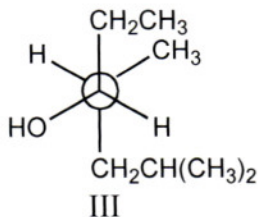
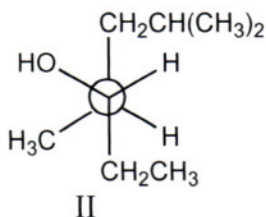
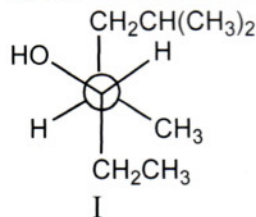
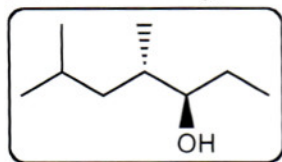
- A) Eclipsed, more stable than the conformation at 0°
 B) Eclipsed, more stable than the conformation at 180°
 C) Staggered, more stable than the conformation at 0°
 D) Staggered, less stable than the conformation at 180°
 E) Two of the above are true

36. Which staggered Newman projection(s), looking down the C-2—C-3 bond (C-2 in front and C-3 in back), illustrates the following boxed compound?

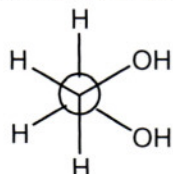


- A) I, II and V
 B) II and V
 C) III and IV
 D) V only
 E) None of the above

37. Which staggered Newman projection(s), looking down the C-3—C-4 bond (C-3 in front and C-4 in back), illustrate(s) the following boxed compound?



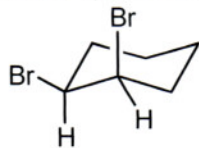
- A) I, II and III
 B) II and V
 C) I and II
 D) III only
 E) None of the above
38. The most stable conformation for 1,2-ethanediol (ethylene glycol) is shown below. It is the most stable conformation because:



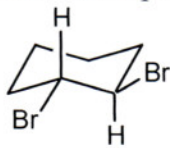
- A) this corresponds to an anti conformation.
 B) in general, gauche conformations possess the minimum energy.
 C) it is stabilized by intramolecular hydrogen bonding.
 D) it is a staggered conformation.
 E) it has the highest energy of all the possibilities.
39. Which cycloalkane has the least ring strain?
- A) Cyclopropane
 B) Cyclobutane
 C) Cyclopentane
 D) Cyclohexane
 E) Cycloheptane

40. The preferred conformation of cis-3-tert-butyl-1-methylcyclohexane is the one in which:
- the tert-butyl group is axial and the methyl group is equatorial.
 - the methyl group is axial and the tert-butyl group is equatorial.
 - both groups are axial.
 - both groups are equatorial.
 - the molecule exists in a boat conformation.

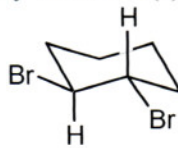
41. trans-1,2-Dibromocyclohexane is represented by structure(s):



I



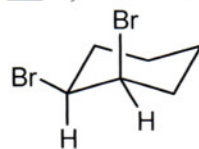
II



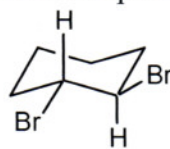
III

- I
- II
- III
- II and III
- I and II

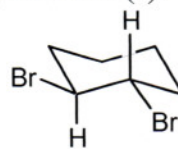
42. cis-1,2-Dibromocyclohexane is represented by structure(s):



I



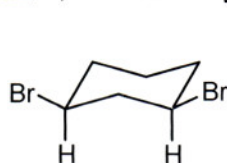
II



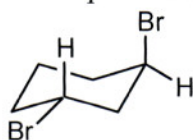
III

- I
- II
- III
- II and III
- I and II

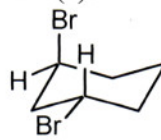
43. cis-1,3-Dibromocyclohexane is represented by structure(s):



I



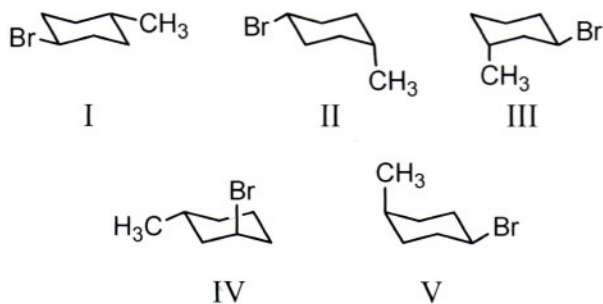
II



III

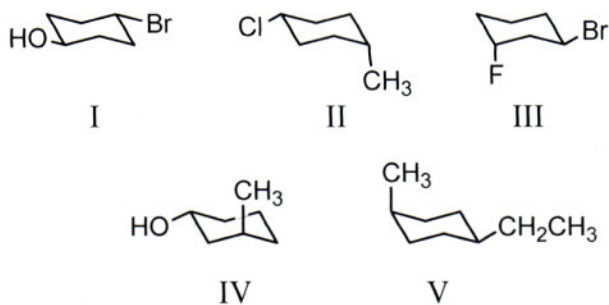
- I
- II
- III
- II and III
- I and II

44. The most stable conformation of cis-1-tert-butyl-2-methylcyclohexane is the one in which:
- the tert-butyl group is axial and the methyl group is equatorial.
 - the methyl group is axial and the tert-butyl group is equatorial.
 - both groups are axial.
 - both groups are equatorial.
 - the twist boat conformation is adopted.
45. In the most stable conformation of cis-1,4-dimethylcyclohexane, the methyl groups are:
- one axial, one equatorial.
 - both axial.
 - both equatorial.
 - alternating between being both axial and both equatorial.
 - None of the above
46. Which conformation represents the most stable conformation of trans-1-bromo-4-methylcyclohexane?



- I
- II
- III
- IV
- V

47. Which of the following can be described as *trans* isomers?



- A) I
B) II, V
C) III, IV
D) I, III and IV
E) None of the above are *trans* isomers.

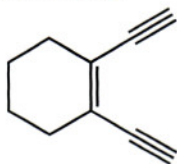
48. Catalytic hydrogenation of which of the following will yield 2-methylpentane?

- A) 2-methyl-1-pentene
B) 2-methyl-2-pentene
C) 4-methyl-2-pentene
D) 4-methyl-1-pentene
E) All of the above

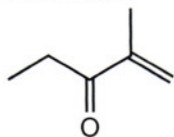
49. What product is formed when *trans*-1,2-dimethylcyclohexane is reacted with Pd/C and H₂?

- A) No reaction
B) *cis*-1,2-dimethylcyclohexane
C) *trans*-3,4-dimethylhexane
D) *trans*-1,2-dimethylhexane
E) None of the above

50. What is the index of hydrogen deficiency (or degree of unsaturation) of the following molecule?



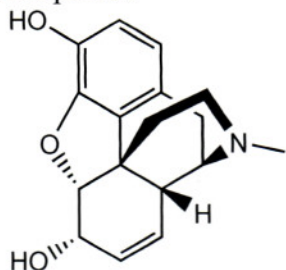
- A) 2
B) 3
C) 4
D) 5
E) 6
51. What is the index of hydrogen deficiency (or degree of unsaturation) of the following molecule?



- A) 2
B) 3
C) 4
D) 5
E) 6
52. What is the index of hydrogen deficiency (or degree of unsaturation) of a compound with the molecular formula of $C_6H_2O_2$?
- A) 3
B) 4
C) 5
D) 6
E) 7
53. What is the index of hydrogen deficiency (or degree of unsaturation) of a compound with the molecular formula of $C_{11}H_{20}Br_3F_4N_3O_3$?

- A) 0
B) 1
C) 2
D) 3
E) 4

54. What is the index of hydrogen deficiency (or degree of unsaturation) for the drug morphine?

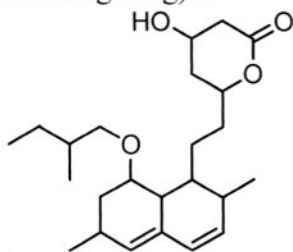


- A) 6
- B) 7
- C) 8
- D) 9
- E) 10

55. Enantiomers are:

- A) molecules that have a mirror image.
- B) molecules that have at least one stereogenic center.
- C) non-superposable molecules.
- D) non-superposable constitutional isomers.
- E) non-superposable molecules that are mirror images of each other.

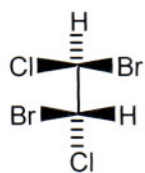
56. How many stereogenic centers are there in Lovastatin (Mevacor® : a cholesterol-lowering drug) ?



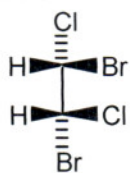
(Lovastatin)

- A) 4
- B) 5
- C) 6
- D) 7
- E) 8

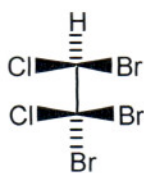
57. Which molecule is achiral?



I



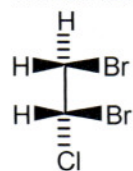
II



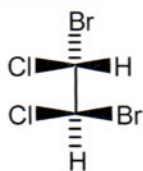
III

- A) I
 B) II
 C) III
 D) More than one of these
 E) None of these

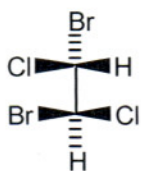
58. Which molecule is achiral?



I



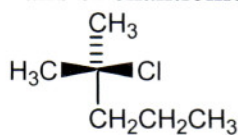
II



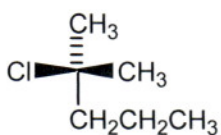
III

- A) I
 B) II
 C) III
 D) More than one of the above
 E) None of the above

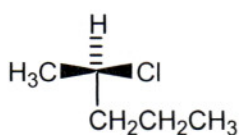
59. Pairs of enantiomers are:



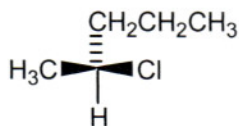
I



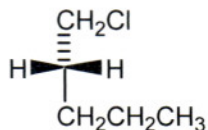
II



III



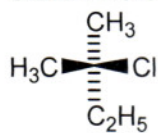
IV



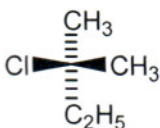
V

- A) I, II and III, IV
 B) I, II
 C) III, IV
 D) IV, V
 E) None of the structures

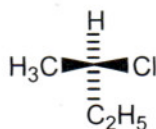
60. Chiral molecules are represented by:



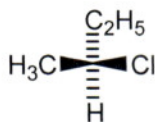
I



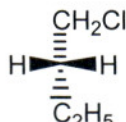
II



III



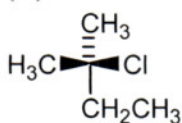
IV



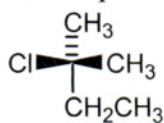
V

- A) I, II, III, IV and V
 B) I, II, III and IV
 C) I and II
 D) III and IV
 E) IV alone

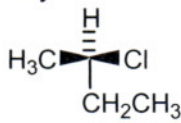
61. (R)-2-Chlorobutane is represented by:



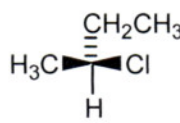
I



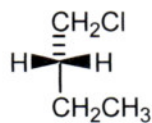
II



III



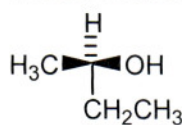
IV



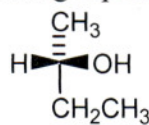
V

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

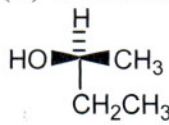
62. Which of the following represent (R)-2-butanol?



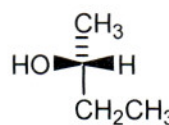
I



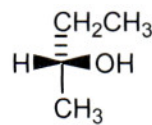
II



III



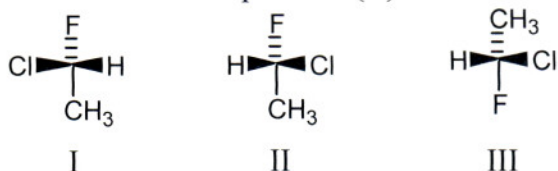
IV



V

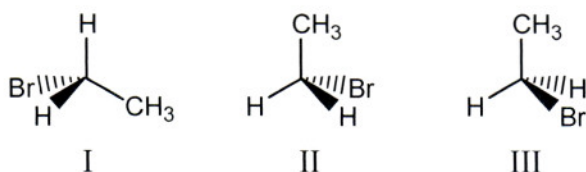
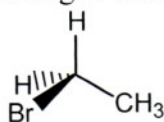
- A) III and V
 B) I, III, IV and V
 C) I, IV and V
 D) I and III
 E) I, II, IV and V

63. Which structure represents (R)-1-chloro-1-fluoroethane?



- A) I
 B) II
 C) III
 D) More than one of the above
 E) None of the above

64. Which of the following is the enantiomer of the following substance?

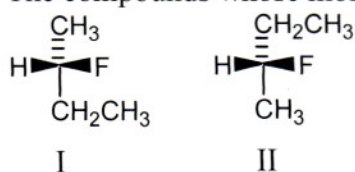


- A) I
 B) II
 C) III
 D) It does not have a non-superposable enantiomer.
 E) Both II and III

65. Which of the following is true about any (R)-enantiomer?

- A) It is dextrorotatory.
 B) It is levorotatory.
 C) It is an equal mixture of + and -.
 D) It is the mirror image of the (S)-enantiomer.
 E) (R) indicates a racemic mixture.

66. The compounds whose molecules are shown below would have:

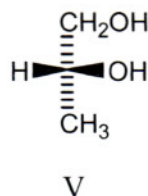
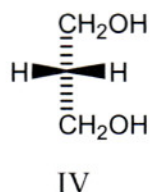
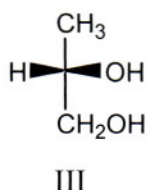
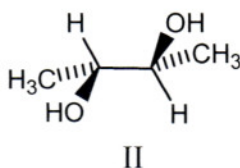
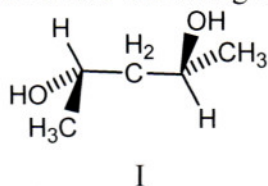


- A) the same melting point.
- B) different melting points.
- C) equal but opposite optical rotations.
- D) More than one of the above
- E) None of the above

67. What can be said with certainty if a compound has $[\alpha]_D^{25} = -9.25$?

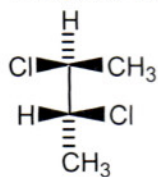
- A) The compound has the (S) configuration.
- B) The compound has the (R) configuration.
- C) The compound is not a meso form.
- D) The compound possesses only one stereogenic center.
- E) The compound has an optical purity of less than 100%.

68. Which of the following is a *meso* compound?

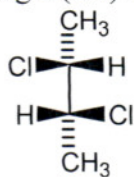


- A) I
- B) II
- C) III
- D) IV
- E) V

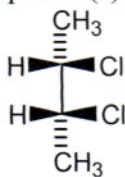
69. Which of the following is(are) *meso* compound(s)?



I



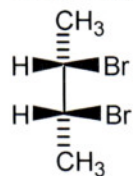
II



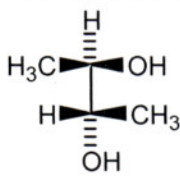
III

- A) I
 B) II
 C) III
 D) Both II and III
 E) Both I and III

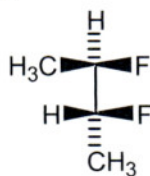
70. Which molecule is a *meso* compound?



I



II



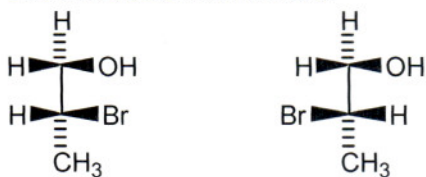
III

- A) I
 B) II
 C) III
 D) More than one of the above
 E) None of the above

71. Which statement is not true for a *meso* compound?

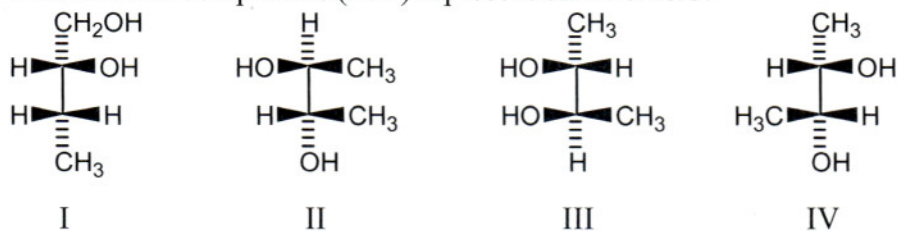
- A) The specific rotation is 0° .
 B) There are one or more planes of symmetry.
 C) A single molecule is identical to its mirror image.
 D) More than one stereogenic center must be present.
 E) The stereochemical labels, (R) and (S), must be identical for each stereogenic center.

72. The molecules shown are:



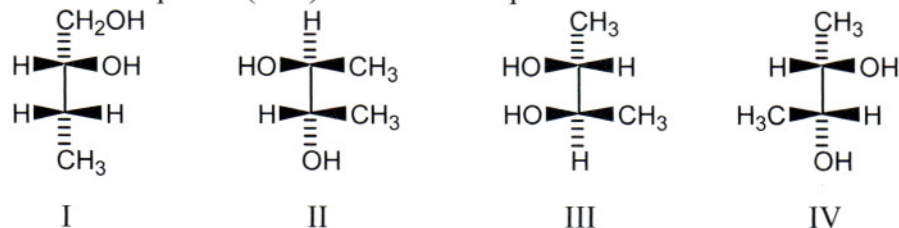
- A) constitutional isomers.
- B) enantiomers.
- C) diastereomers.
- D) identical.
- E) None of these

73. Which of the compounds (I-IV) represent enantiomers?



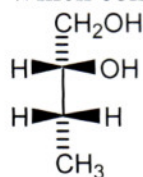
- A) I and II
- B) II and III
- C) III and IV
- D) II and IV
- E) III and I

74. Which compound (I-IV) is a meso compound?

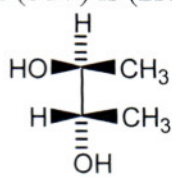


- A) I
- B) II
- C) III
- D) IV
- E) None of these

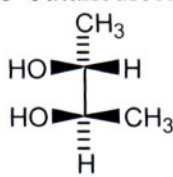
75. Which compound (I-IV) is (2R,3R)-2,3-butanediol?



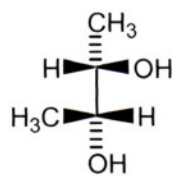
I



II



III



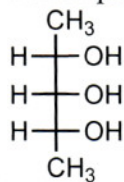
IV

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

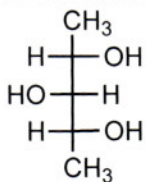
76. Which of the following molecules is achiral?

- A) (2R,3R)-2,3-Dichloropentane
 B) (2R,3S)-2,3-Dichloropentane
 C) (2S,4S)-2,4-Dichloropentane
 D) (2S,4R)-2,4-Dichloropentane
 E) Two of these

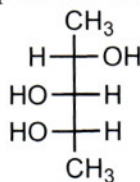
77. Which pair of structures represents the same compound?



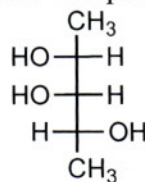
I



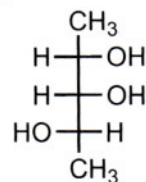
II



III



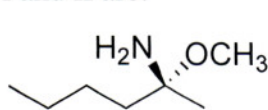
IV



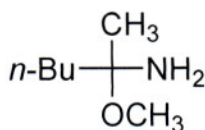
V

- A) I and II
 B) II and III
 C) III and IV
 D) III and V
 E) IV and V

78. I and II are:

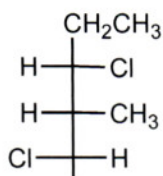


I



II

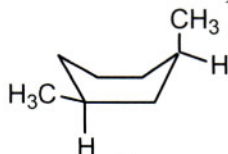
- A) constitutional isomers.
- B) enantiomers.
- C) identical.
- D) diastereomers.
- E) not isomeric.



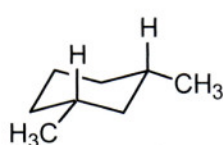
79. CH_3 is properly named:

- A) (3R,4S,5R)- 3,5-Dichloro-4-methylhexane
- B) (2S,3S,4S)- 2,4-Dichloro-3-methylhexane
- C) (2S,3R,4R)- 2,4-Dichloro-3-methylhexane
- D) (2S,3R,4S)-2,4-Dichloro-3-methylhexane
- E) (2S,3S,4R)- 2,4-Dichloro-3-methylhexane

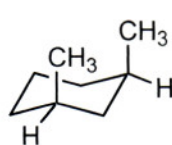
80. What structure represents the most stable conformation of cis-1,3-dimethylcyclohexane?



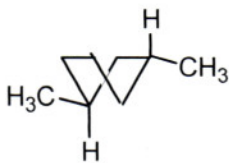
I



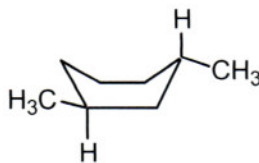
II



III



IV

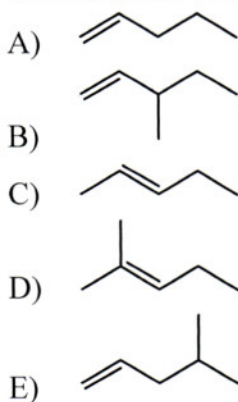


V

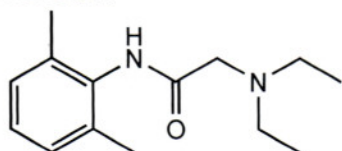
- A) I
- B) II
- C) III
- D) IV
- E) V

81. The most stable conformation of trans-1-tert-butyl-3-methylcyclohexane is the one in which:
- the tert-butyl group is axial and the methyl group is equatorial.
 - the methyl group is axial and the tert-butyl group is equatorial.
 - both groups are axial.
 - both groups are equatorial.
 - the twist boat conformation is adopted.

82. Which alkene would yield 3-methylpentane when subjected to catalytic hydrogenation?



83. What is the index of hydrogen deficiency (or degree of unsaturation) for the drug lidocain?

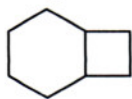


- 3
- 4
- 5
- 6
- 7

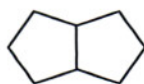
84. Which of the following structures represents bicyclo[3.2.1]octane?



I



II



III



IV



V

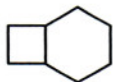
- A) I
- B) II
- C) III
- D) IV
- E) V

85. Which is the correct name for the compound shown below?



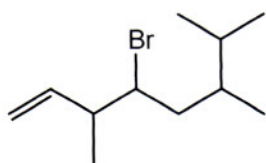
- A) Bicyclo[2.2.0]hexane
- B) Bicyclo[2.2.0]butane
- C) Bicyclo[2.2.2]hexane
- D) Bicyclo[2.2.1]hexane
- E) Disquarane

86. What is the name of this compound?



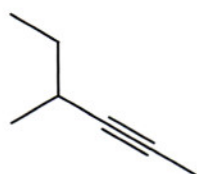
- A) Bicyclo[2.2.2]octane
- B) Bicyclo[3.2.1]octane
- C) Bicyclo[4.1.1]octane
- D) Bicyclo[4.2.0]octane
- E) Bicyclo[3.3.0]octane

87. A correct IUPAC name for the following compound is:



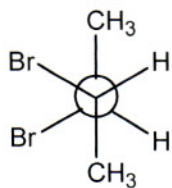
- A) 3,6,7-trimethyl-4-bromo-1-octene
 B) 4-bromo-3-methyl-6-isopropyl-1-heptene
 C) 4-bromo-3,6,7-trimethyl-1-octene
 D) 4-bromo-6-isopropyl-3-methyl-1-heptene
 E) 4-bromo-6-isopropyl-3,6-dimethyl-1-hexene

88. Give the IUPAC name for

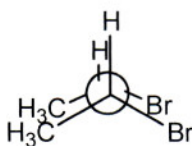


- A) 3-Methyl-4-hexyne
 B) 4-Methyl-2-hexyne
 C) 2-Ethyl-3-pentyne
 D) 4-Ethyl-2-pentyne
 E) 3-Methyl-2-hexyne

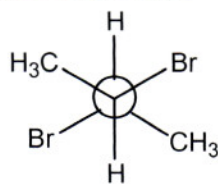
89. Which conformation(s) show(s) the bromines in a gauche orientation for 2,3-dibromobutane, viewed through the C-2—C-3 bond?



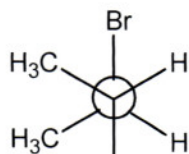
I



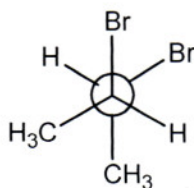
II



III



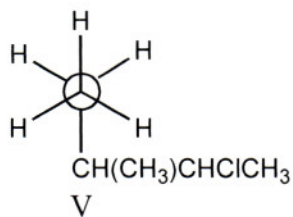
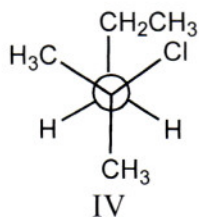
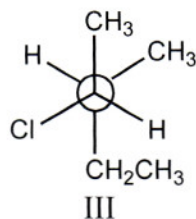
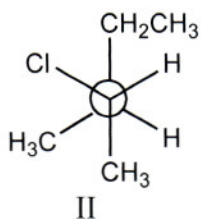
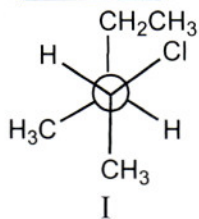
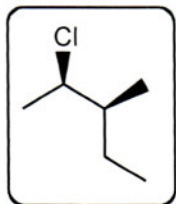
IV



V

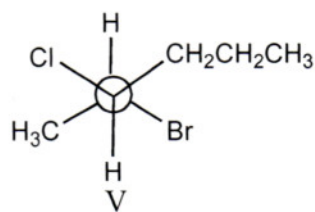
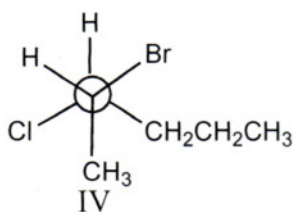
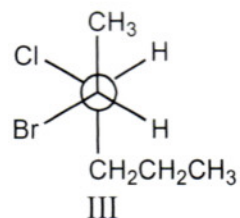
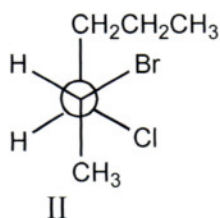
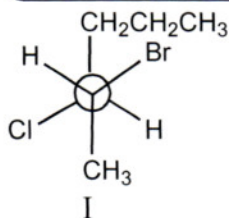
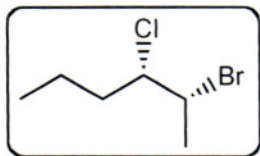
- A) I and II only
 B) III and IV only
 C) I and V only
 D) II only
 E) None of the above

90. Which staggered Newman projection(s), looking down the C-2—C-3 bond (C-2 in front and C-3 in back), illustrates the following boxed compound?



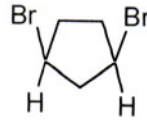
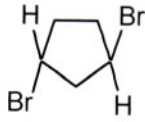
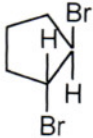
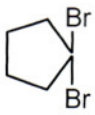
- A) I, II and III
 B) II and V
 C) I and II
 D) V only
 E) None of the above

91. Which staggered Newman projection(s), looking down the C-2—C-3 bond (C-2 in front and C-3 in back), illustrate(s) the following boxed compound?



- A) I only
 B) II and V
 C) I and II
 D) III only
 E) None of the above
92. Which cycloalkane has the greatest ring strain?
- A) Cyclopropane
 B) Cyclobutane
 C) Cyclopentane
 D) Cyclohexane
 E) Cycloheptane
93. Which of the following is true of any (S)-enantiomer?
- A) It rotates plane-polarized light to the right.
 B) It rotates plane-polarized light to the left.
 C) It is a racemic form.
 D) It is the mirror image of the corresponding (R)-enantiomer.
 E) It has the highest priority group on the left.

94. Which of the following is(are) *meso*?



I

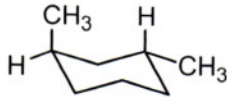
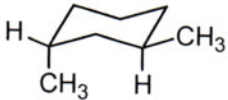
II

III

IV

- A) I
 B) II
 C) III
 D) IV
 E) Two of the above

95. The structures



represent:

- A) a single compound.
 B) enantiomers.
 C) meso forms.
 D) diastereomers.
 E) conformational isomers.

96. Hexane and 3-methylpentane are examples of:

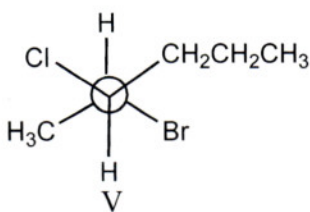
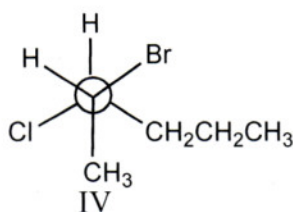
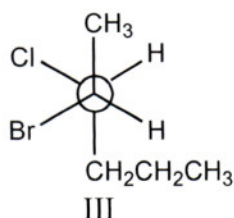
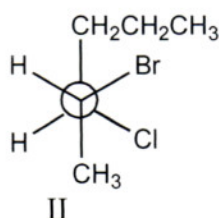
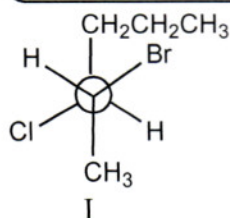
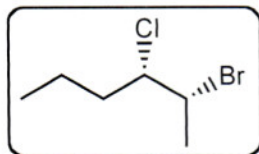
- A) enantiomers.
 B) stereoisomers.
 C) diastereomers.
 D) constitutional isomers.
 E) None of these

97. The molecules below are:



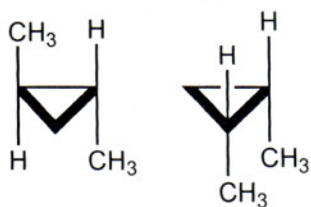
- A) constitutional isomers.
 B) enantiomers.
 C) diastereomers.
 D) identical.
 E) stereoisomers.

91. Which staggered Newman projection(s), looking down the C-2—C-3 bond (C-2 in front and C-3 in back), illustrate the following boxed compound?



- A) I only
 B) II and V
 C) I and II
 D) III only
 E) None of the above
92. Which cycloalkane has the greatest ring strain?
- A) Cyclopropane
 B) Cyclobutane
 C) Cyclopentane
 D) Cyclohexane
 E) Cycloheptane
93. Which of the following is true of any (S)-enantiomer?
- A) It rotates plane-polarized light to the right.
 B) It rotates plane-polarized light to the left.
 C) It is a racemic form.
 D) It is the mirror image of the corresponding (R)-enantiomer.
 E) It has the highest priority group on the left.

98. The molecules below are:



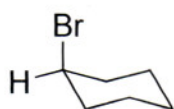
- A) structural isomers.
- B) enantiomers.
- C) diastereomers.
- D) identical.
- E) None of these

99. The molecules below are:

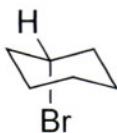


- A) constitutional isomers.
- B) enantiomers.
- C) diastereomers.
- D) identical.
- E) None of these

100. I and II are:



I



II

- A) constitutional isomers.
- B) enantiomers.
- C) identical.
- D) diastereomers.
- E) not isomeric.

Answer Key

1. C
2. C
3. D
4. E
5. B
6. D
7. C
8. E
9. D
10. C
11. A
12. D
13. E
14. E
15. C
16. D
17. B
18. E
19. C
20. D
21. D
22. C
23. D
24. E
25. A
26. A
27. C
28. E
29. B
30. C
31. C
32. A
33. C
34. E
35. A
36. B
37. D
38. C
39. D
40. D
41. D
42. A
43. A
44. B
45. A
46. A
47. C
48. E
49. A
50. E
51. A
52. D
53. A
54. D
55. E
56. E
57. A
58. C
59. C
60. D
61. C
62. C
63. B
64. D
65. D
66. D
67. C
68. A
69. E
70. D
71. E
72. B
73. B
74. D
75. C
76. D
77. D
78. B
79. D
80. B
81. B
82. B
83. C
84. E
85. A
86. D
87. C
88. B
89. C
90. E
91. A
92. A
93. D
94. D
95. A
96. D
97. A
98. C
99. D
100. C