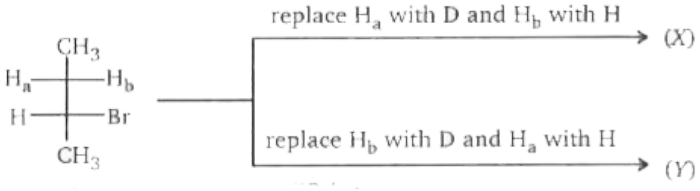
CHEMISTRY

BOOKS - MS CHOUHAN

ISOMERISM (STRUCTURAL & STEREOISOMERISM)

Level 1

1.



Relation between (X) and (Y) is :

A. enantiomers

B. diastereomers

C. E and Z isomer

D. constitutional isomer

Answer: B

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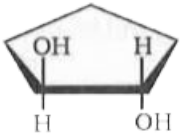
2. Which of the following cyclopentane derivative is optically inactive ?

A.

B.



C.

D.

Answer: C

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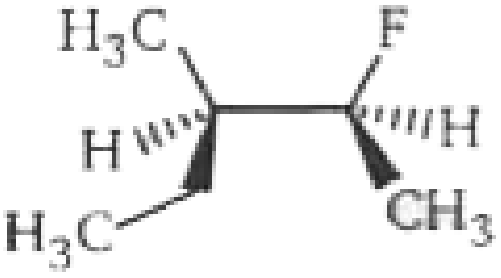
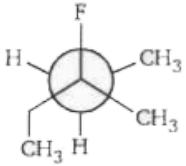
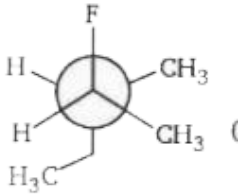
3. Which is the most stable conformer along the 2,3 C-C bond axis of the compound ?



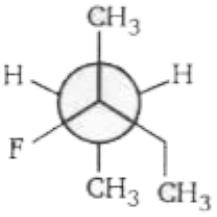
A.



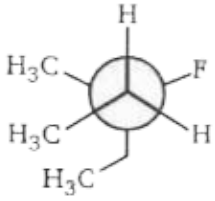
B.



C.



D.



Answer: B

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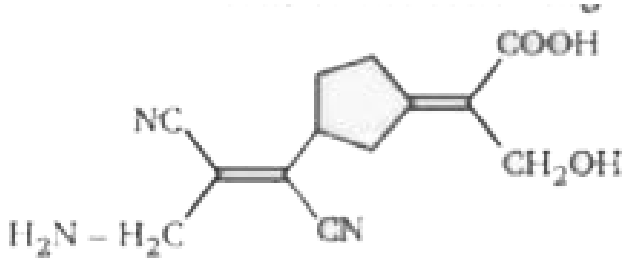
4. Assign double bond configurations to the following:



A. E

B. Z

C. E, E

D. Z, Z

Answer: C

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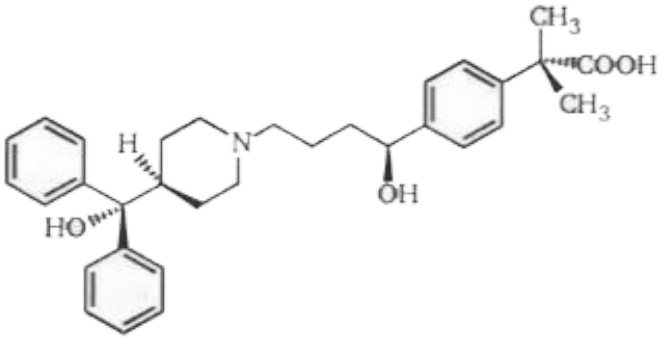
5. Allegra, a common prescription drug with the structure shown below, is given for the treatment of seasonal allergies. How many stereogenic carbon does Allegra possess ?



A. 1

B. 2

C. 3

D. 4

Answer: A

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6. How many meso isomers of $C_4H_8Cl_2$ will be ?

A. 0

B. 1

C. 2

D. 3

Answer: B

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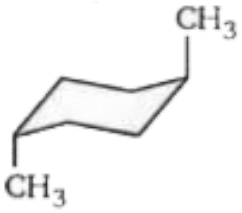
7. The stable form of trans-1, 4 dimethylcyclohexane is represented as:

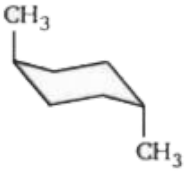
A.

B.



C.

D.



Answer: C

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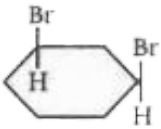
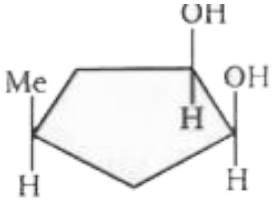
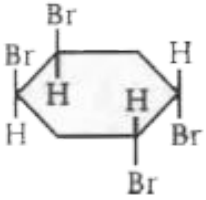
8. Which of the following compound is non-resovable (meso) compounds ?

A. 

B. 

C. 

D. All of these

Answer: D

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9. $HO - \underset{(2)}{CH_2} - \underset{(3)}{CH_2} - F$

Which conformer of above compound is most stable across $C_2 - C_3$?

A. staggered

B. eclipsed (partially)

C. gauche

D. fully eclipsed

Answer: C

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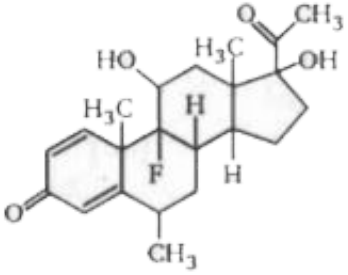
10. The following molecule is fluorometholone, a steroidal anti-inflammatory agent. How many stereogenic centers does it contain ?



fluorometholone

A. 5

B. 6

C. 7

D. 8

Answer: D

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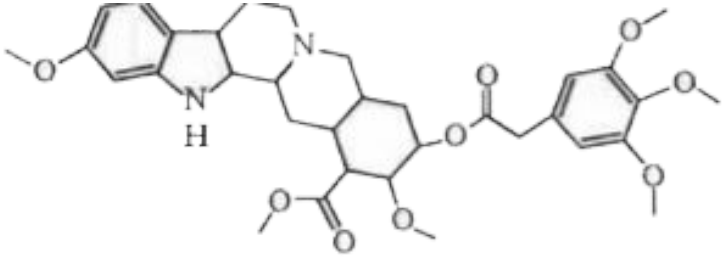
11. How many chiral carbons are there in Reserpine (an antipsychotic drug) ?



A. 9

B. 8

C. 7

D. 6

Answer: B

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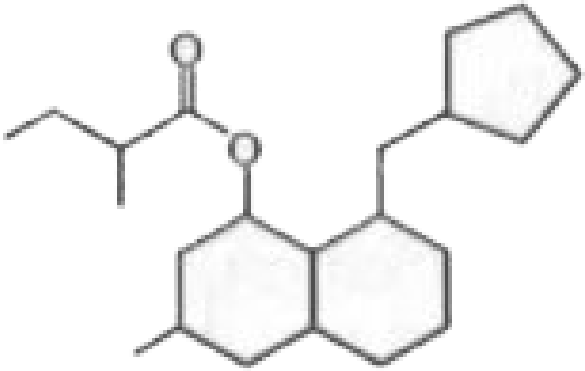
12. How many chiral centers are in the following compound ?



A. 4

B. 5

C. 6

D. 7

Answer: C

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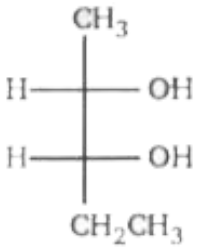
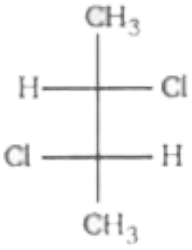
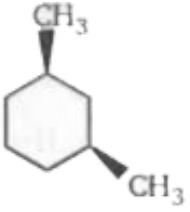
13. Which of the following compounds are meso forms ?







A. A) 1 only

B. B) 3 only

C. C) 1 and 2

D. D) 2 and 3

Answer: B

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14. The process of separation of racemic mixture into d andl enantiomers is called :

A. Racemization

B. Isomerization

C. Resolution

D. Equilibration

Answer: C

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15. Rank of the following groups in order of R, S precedence (IV is highest) : -

$\underset{1}{-CH(CH_3)_2}$ $\underset{2}{-CH_2CH_2Br}$ $\underset{3}{-CH_2Br}$ $\underset{4}{-C(CH_3)_3}$

A. A) $\begin{matrix} I & II & III & IV \\ 3 & 2 & 4 & 1 \end{matrix}$

B. B) $\begin{matrix} I & II & III & IV \\ 1 & 4 & 2 & 3 \end{matrix}$

C. C) $\begin{matrix} I & II & III & IV \\ 3 & 4 & 1 & 2 \end{matrix}$

D. D) $\begin{matrix} I & II & III & IV \\ 3 & 4 & 2 & 1 \end{matrix}$

Answer: C

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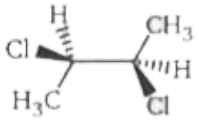
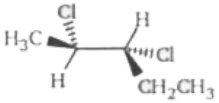
16. Which of the following is a meso compound ?

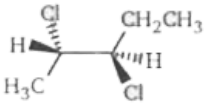
A. A)

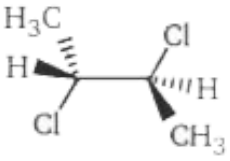


B. B)



C. C)





D. D)

Answer: D

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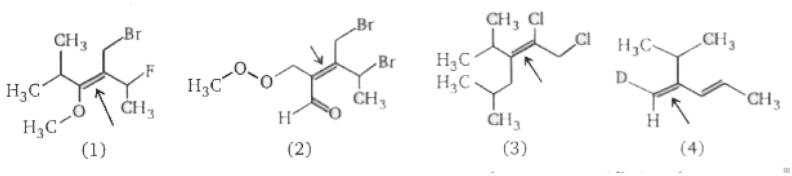
17. Among the following structures, select E isomers (arrows indicate the bonds to be considerd) ?



A. A) 1 and 2

B. B) 1 and 3

C. C) 1 and 4

D. D) 2 and 3

Answer: C

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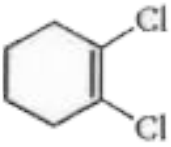
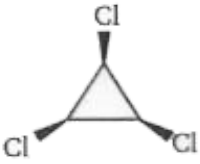
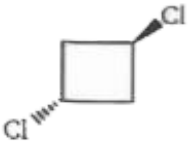
18. Which of the following compounds has a zero dipole moment ?

A. A) 

B. B) 

C. C) 

D. D) 

Answer: D

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19. On Pluto, where everything is frozen, astronauts discovered two forms of butane gauche and anti. Assuming that there are no rotations around single bonds, which statement about the two forms is correct ?

A. A) They are enantiomers

B. B) They are diastereoisomers

C. C) They are meso compounds

D. D) The gauche form has two stereogenic centers, and the anti has only one

Answer: B

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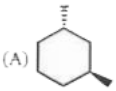
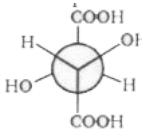
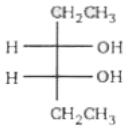
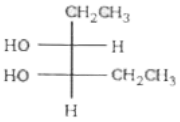
20. Which of the following will show optical activity ?

(A) 

(B) 

(C) 

(D) 

(E) $50/50$ mixture of C and D

A. A) A, D and E

B. B) A and E only

C. C) B, C and D

D. D) All except C

Answer: A

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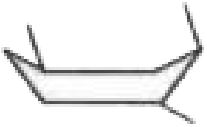
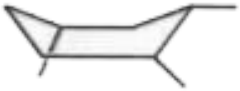
21. Among the structure shown below, which has lowest potential energy?

A. 

B. 

C. 

D. 

Answer: A

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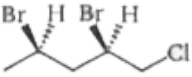
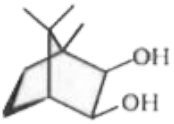
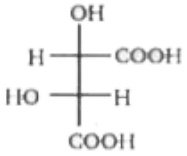
22. Which of the following molecules is/are chiral ?

(I) 

(II) 

(III) 

A. I

B. II

C. III

D. I, II

Answer: D

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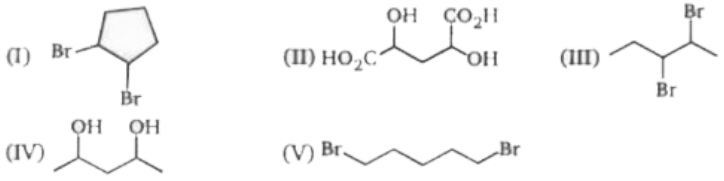
23. A compound was synthesized by a student, but its structure was not identified.However, his wonderfully helpful instructor told him that it was a meso compound with 5 carbons and 2 stereogenic centers. Which of the following structures should the student consider as possibilities for his compound ?



A. I,II,IV

B. II, IV

C. I, III, V

D. II, IV, V

Answer: A

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24. How many isomers are possible for the following molecule ?

A. 1

B. 2

C. 3

D. 4

Answer: D

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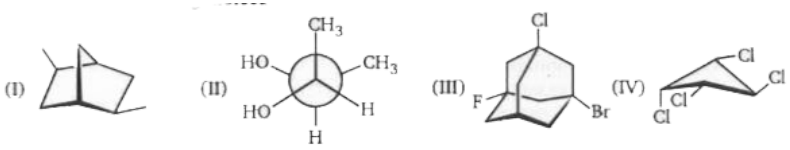
25. Which of the following molecules are chiral ?



A. A) I, II, III and IV

B. B) II, III and IV

C. C) II and IV

D. D) I and II

Answer: A

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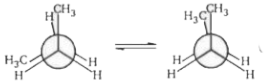
26. Which equilibrium is not rapid at room temperature ?

A. 

B. 

C. 

D. 

Answer: B

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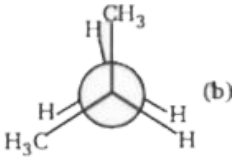
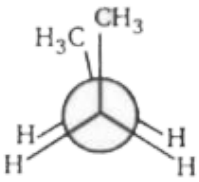
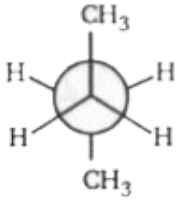
27. Which is the lowest energy conformation of butane ?

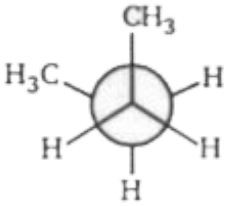
A. 

B. 

C.



D.



Answer: C

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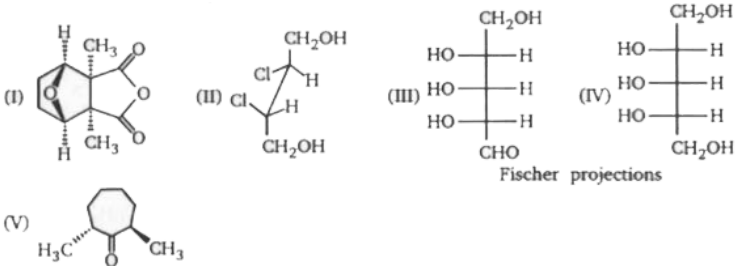
28. Which of the structures given below are chiral ?



A. A) I, II, III

B. B) II, III, V

C. C) II, III

D. D) I, II

Answer: B

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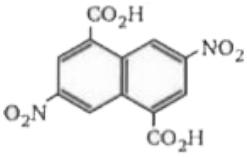
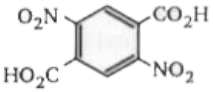
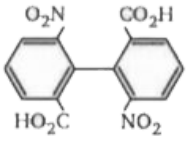
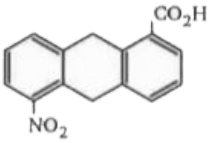
29. Which of the following carboxylic acids could be resolved by reaction with an enantiomerically pure chiral amine ?

A. A) 

B. B) 

C. C) 

D. D)



Answer: C

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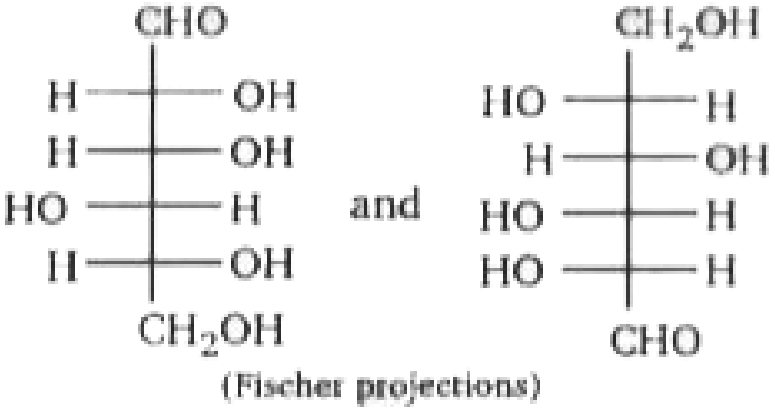
30. What is the relationship between the molecules in the following pairs ?



(Fischer projections)

A. enantiomers

B. diastereomers

C. identical

D. structural isomers

Answer: C

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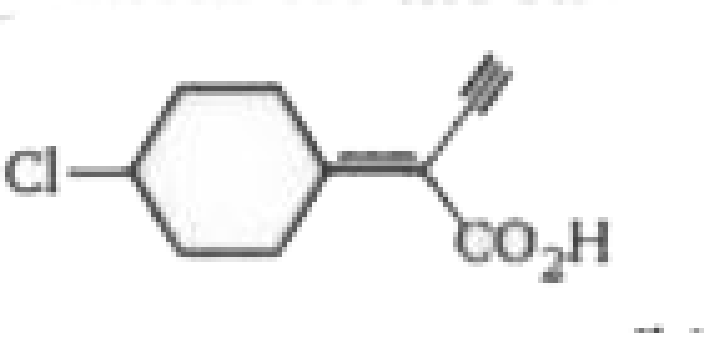
31. What are the correct designations for the structure below ?



A. E, E

B. Z, E

C. E, Z

D. No geometrical isomers are possible

Answer: D

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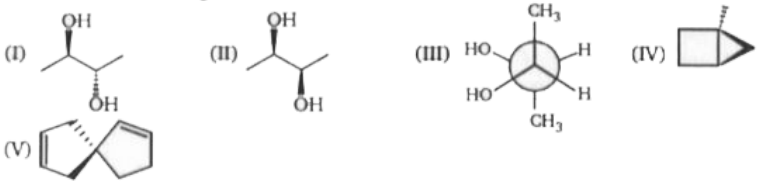
32. Which of the following molecules are chiral ?



A. A) I and III

B. B) I and V

C. C) II and III

D. D) II, III, IV

Answer: D

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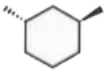
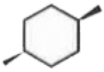
33. Which one of the following isomeric structures has the lowest energy ?

(a)  (b)  (c)  (d) 

(e) 

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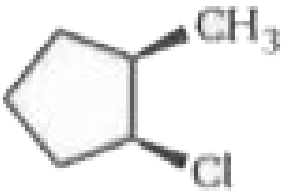
34. The following compounds are identical with respect to :



A. molecular composition

B. boiling point

C. melting point

D. IUPAC name

Answer: A

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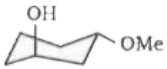
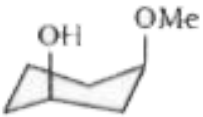
35. Among the following, the most stable isomer is :

A. 

B. 

C. 

D. 

Answer: D

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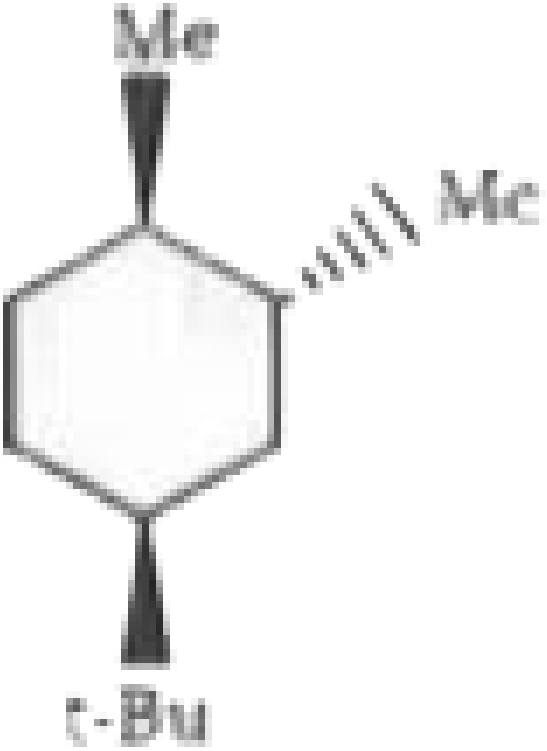
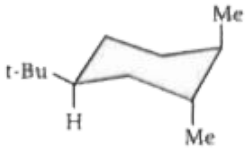
36. The most stable conformation of the following compound is :



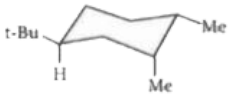
A. A)

B. B)

C. C)



D. D)



Answer: C

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37. Which of the following molecules have non zero dipole moments ?

(I) gauche conformation of 1, 2-dibromoethane

(II) anti conformation of 1, 2-dibromoethane

(III) trans-1, 4-dibromocyclohexane

(IV) cis-1, 4-dibromocyclohexane

(V) tetrabromomethane

(VI) 1, 1-dibromocyclohexane

A. A) I and II

B. B) I and IV

C. C) II and V

D. D) I, IV and VI

Answer: D

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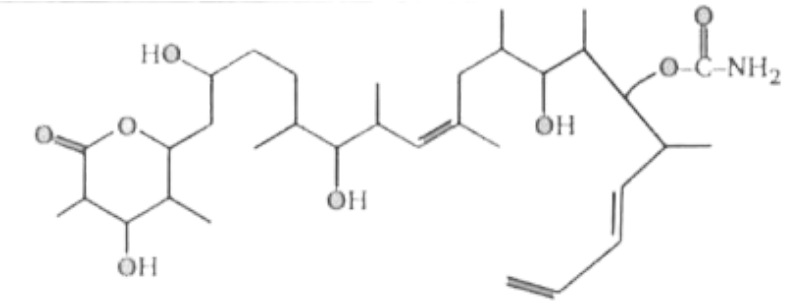
38. What is the maximum number of stereoisomers possible for discodermolide ?



A. A) 2^{14}

B. B) 2^{15}

C. C) 2^{16}

D. D) 2^{17}

Answer: B

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39. An aqueous solution containing compounds A and B shows optical activity. A and B are stereoisomers. Which of the following possibilities cannot be correct?

A. A has two chiral centers, but B does not have any because it has a symmetry plane

B. A and B are enantiomers

C. A and B are diastereomers

D. A and B are not present in equal amounts

Answer: A

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40. Which of the following structures represents the lowest-energy form of (1S, 2S, 4R)-trimethyl -cyclohexane ?

A. 

B. 

C. 

D. 

Answer: A

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41. Which one of the following is a diastereomer of (R)-4-bromo-cis-2-hexene ?

A. (S)-4-bromo-cis-2-hexene

B. (S)-5-bromo-trans-2-hexene

C. (R)-4-bromo-trans-2-hexene

D. (R)-5-bromo-trans-2-hexene

Answer: C

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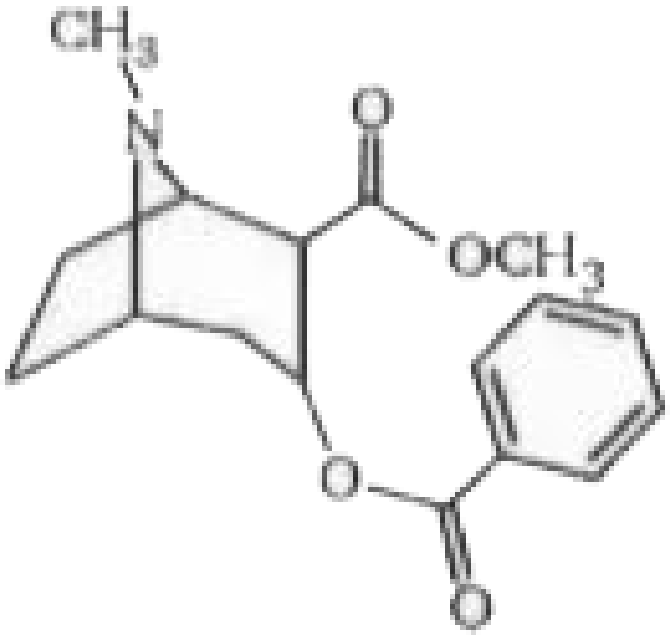
42. The structural formula of cocaine is shown below. How many stereogenic carbon atoms are there in this molecule ?



A. 1

B. 2

C. 3

D. 4

Answer: D

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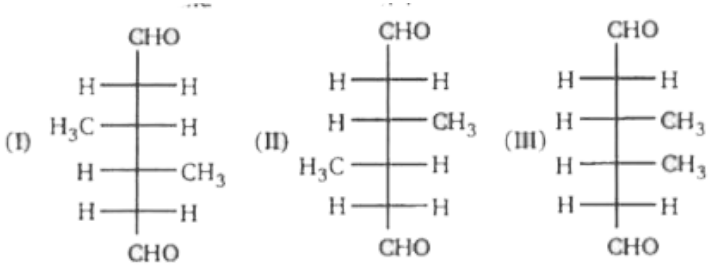
43. Which of the following statements best describes the stereochemical relationships of compound I, II and III shown below ?



A. All compounds are chiral

B. None of the compounds is chiral

C. I and II are meso compounds

D. I and II are diastereomers, and III is a meso compound

Answer:

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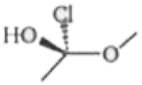
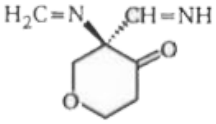
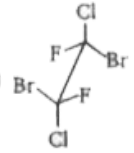
44. What is the absolute configuration of the following molecules ? (NS = the molecule has no center) Note : For the purpose of this question only,

the order of stereocenters is not specified , i.e., R, S = S, R.

(I) 

(II) 

(III) 

(IV) 

A. A)

I	II	III	IV
R	R,S	R	NS

B. B)

I	II	III	IV
R	R,R	S	R,R

C. C)

I	II	III	IV
R	R,S	NS	NS

D. D)

I	II	III	IV
R	R,S	R	R,S

Answer: D

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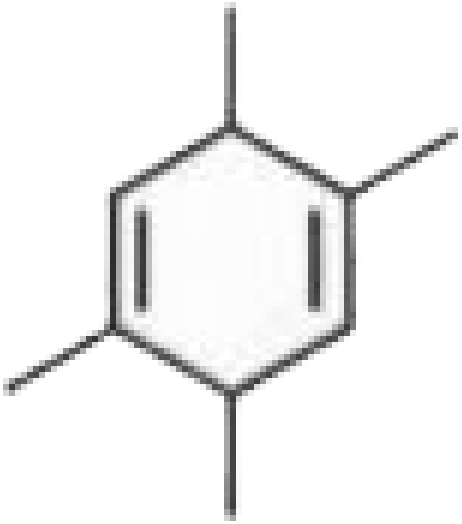
45. The number of all the possible stereoisomers formed by the given compound is :



A. 2

B. 3

C. 32

D. 64

Answer: B

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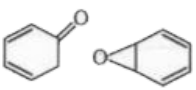
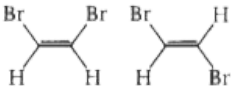
46. The relationship among the following pairs of isomers is:

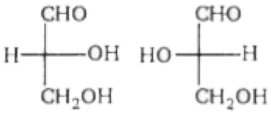
(I)



(II)



(III)



(IV)

I	A: Constitutional
II	B: Configurational
III	C: Conformational
IV	D: Optical

A. A) $I - A, II - B, III - B, IV - D$

B. B) $I - A, II - A, III - B, IV - D$

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

D. D) $I - B, II - B, III - A, IV - B$

Answer: B

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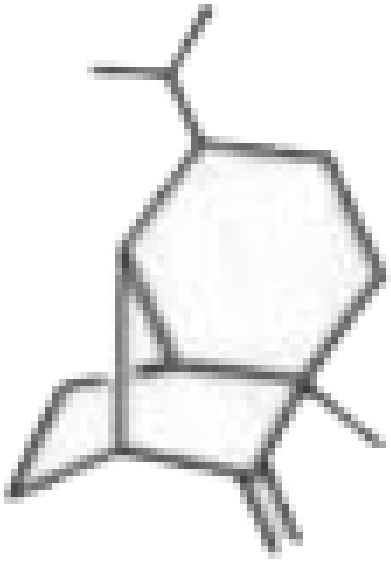
47. The structural formula of sativene is shown below. How many stereogenic centers are there in this molecule ?



A. 2

B. 4

C. 3

D. 5

Answer: D

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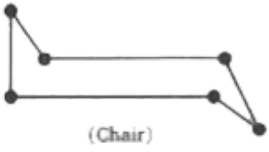
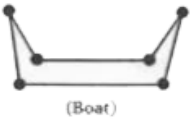
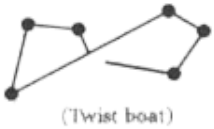
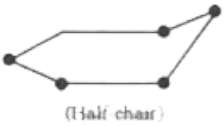
48. Which of the following is the least stable conformer of cyclohexane ?

A. 

B. 

C. 

D. 

Answer: D

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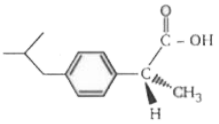
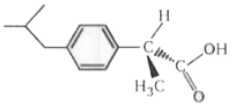
49. The S- enantiomer of ibuprofen is responsible for its pain-relieving properties. Which one of the following structures shown below is (S)-ibuprofen ?

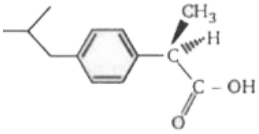
A.



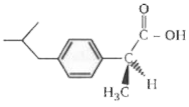
B.



C.



D.



Answer: D

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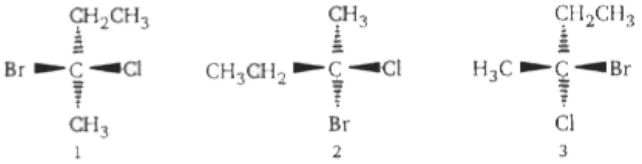
50. Which of the following depict the same ?



A. 1 and 2

B. 2 and 3

C. 1 and 3

D. 1, 2, and 3

Answer: D

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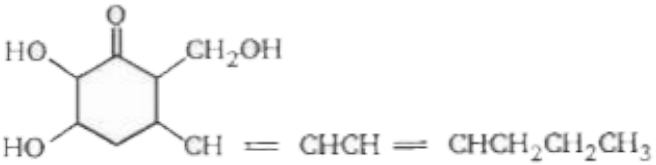
51. A naturally occurring substance has the constitution shown below. How many may have this constitution ?



A. 2

B. 8

C. 16

D. 64

Answer: D

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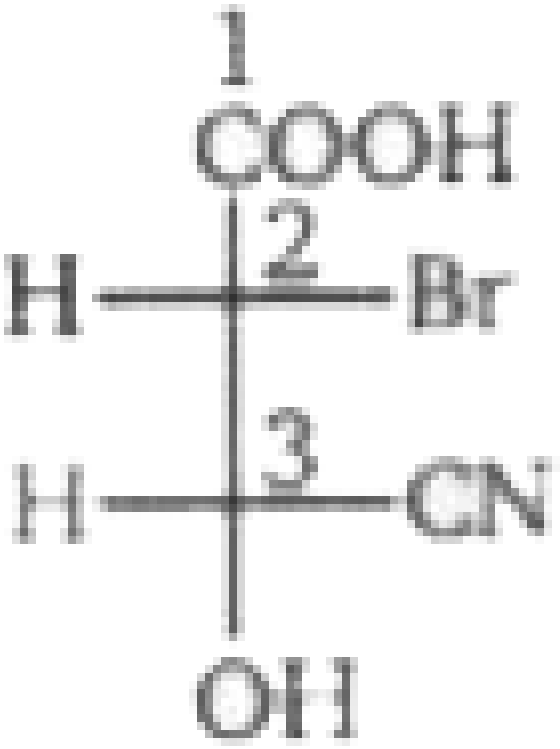
52. The absolute configurations of the two centers in the following molecule are :



A. $2(R), 3(S)$

B. $2(R), 3(R)$

C. $2(S), 3(S)$

D. $2(S), 3(R)$

Answer: A

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53. The total number of stereoisomer possible for 2, 3-dichloro butane :

A. 2

B. 3

C. 4

D. 5

Answer: B

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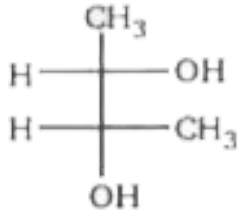
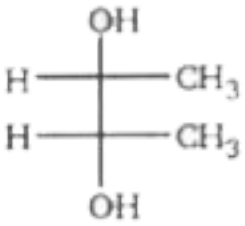
54. Which of the following structure is not meso-2,3-butanediol ?

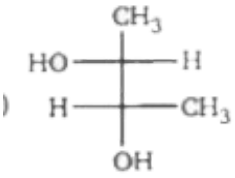
A.



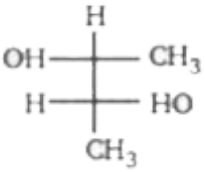
B.



C.



D.



Answer: A

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55. A solution of optically active 1- phenylethanol racemizes in acidified aqueous medium. It is due to :

A. enolization

B. carbonium ion formation

C. carbanion formation

D. reversible oxidation-reduction

Answer: B

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56. The most stable conformation of ethylene glycol is :

A. A) Anti

B. B) Gauche

C. C) Partially eclipsed

D. D) Fully eclipsed

Answer: B

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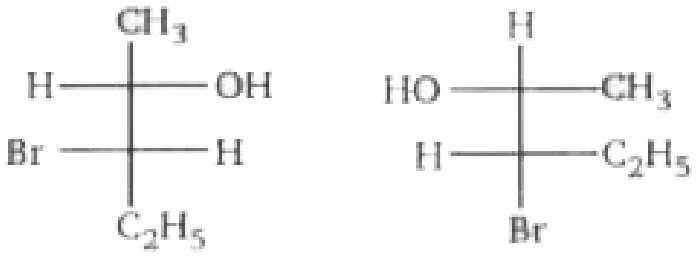

57.

The molecules represented by the above two structures are :

A. identical

B. enantiomers

C. diastereomers

D. epimers

Answer: A

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58. The correct order of priority of groups - $SCH_3(I),\ -NO_2(II),\ -C\equiv CH(III)$ and $-CH_2C_6H_5(IV)$, on the basis of CIP classification, is (increasing order) :

A. I, III, II, IV

B. IV, III, II, I

C. II, IV, I, III

D. III, IV, II, I

Answer: B

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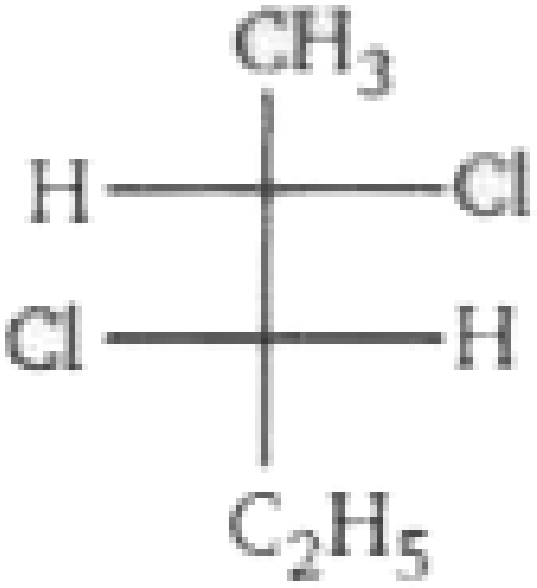
59. The configuration at C-2 and C-3 of the compound given :



A. $2R, 3S$

B. $2S, 3R$

C. $2S, 3S$

D. $2R, 3R$

Answer: C

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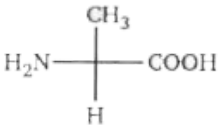
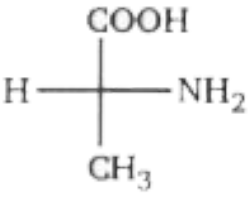
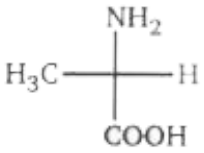
60. Amongst the following amino acids, the (R) - enantiomer is represented by:

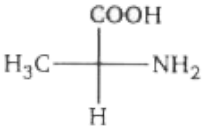
A. 

B. 

C.



D.



Answer: B

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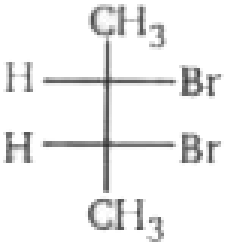
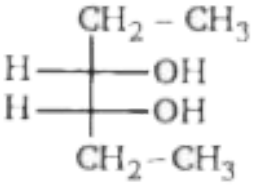
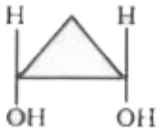
61. Which of the following is a meso compound ?

A.



B.



C. 

D. All of these

Answer: D

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62. Predict stereochemistry of product when d and l-amine reacts with l-acid:

A. Diastereomers

B. Meso

C. Racemic

D. Pure Enantiomer

Answer: A

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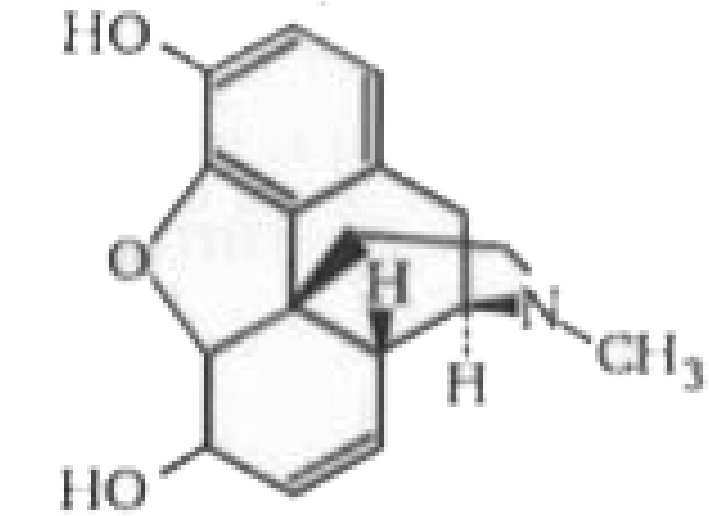
63. How many chiral center (excluding N centres) are there in morphine?



A. 4

B. 5

C. 6

D. More than 6

Answer: B

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64. Which dimethylcyclobutane is optically active ?

A. trans-1,2

B. cis-1, 2

C. trans-1,3

D. cis-1, 3

Answer: A

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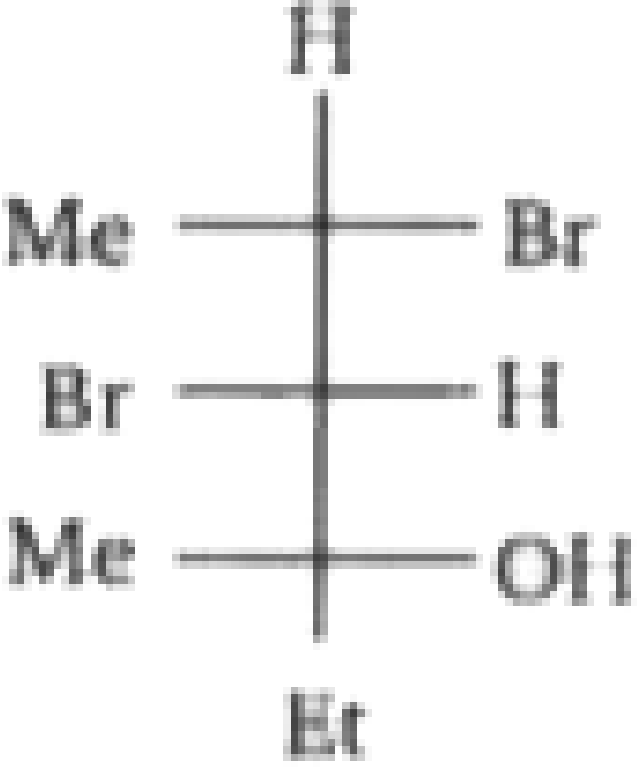
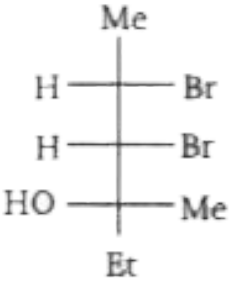
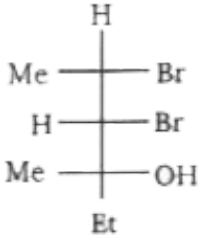
65. Which of the following is the enantiomer of the compound shown below ?



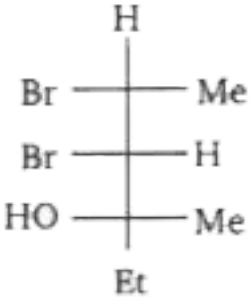
A.



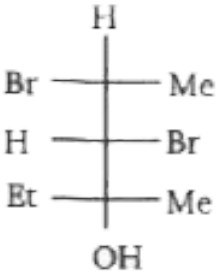
B.



C.



D.



Answer: A

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66. How many different stereoisomers are possible for the following compound ?

$$ClHC = HC - \overset{\overset{H}{|}}{\underset{\underset{Cl}{|}}{C}} - CH = CHCl$$

A. 1

B. 2

C. 3

D. 0

Answer: D

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67. The following compounds are best described as :

$(R) - PhCH(OH)CH_3$ and $(S) - PhCH(OH)CH_3$

A. enantiomers

B. diastereomers

C. not stereoisomers

D. conformational isomers (differing by single bond rotation)

Answer: A

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68. Rank of the following groups in order of R, S precedence (IV is highest) : -

$\underset{1}{-CH(CH_3)_2}$ $\underset{2}{-CH_2CH_2Br}$ $\underset{3}{-CH_2Br}$ $\underset{4}{-C(CH_3)_3}$

A. $2 > 3 > 1$

B. $1 > 3 > 2$

C. $3 > 1 > 2$

D. $2 > 1 > 3$

Answer: D

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69. Compare the stabilities of the following two compounds :

A : cis-1-Ethyl-3-methylcyclohexane

B: trans-1-Ethyl-3-methylcyclohexane

A. A is more stable

B. A and B are of equal stability

C. B is more stable

D. No comparison can be made

Answer: A

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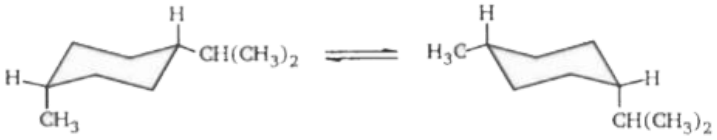
70. What, if anything, can be said about the magnitude of the equilibrium constant K for the following equilibrium ?



A. $K = 1$

B. $K < 1$

C. $K > 1$

D. No estimate of K can be made

Answer: B

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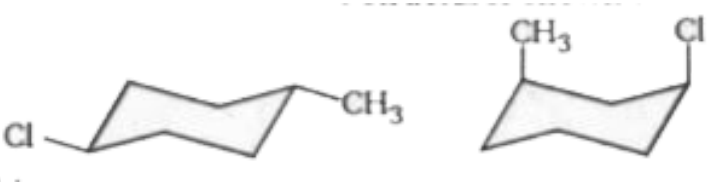
71. What is the relationship between the two structures shown ?



A. Constitutional isomers

B. Stereoisomers

C. Different drawing of the same conformation of the same compound

D. Different conformation of the same compound

Answer: A

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72. Which of the following statements is true ?

A. van der Waals' strain in cis-1, 2 dimethylcyclopropane is the principal reason for its decreased stability relative to the trans isomer

B. Cyclohexane gives off more heat per CH_2 group on being burned in air than any other cycloalkane

C. The principal source of strain in the boat conformation of cyclohexane is angle strain

D. The principal source of strain in the gauche conformation of butane is torsional strain

Answer: A

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73. $Ph - CH = NO_2H \xrightarrow[3\text{ days}]{\text{isomerises}} \underset{(50-50\,\%)}{(x)}$ Isomer (x) is :

A. $Ph - NO - CH_2OH$

B. $Ph - CH_2 - NO_2$

C. $Ph - NH - CO_2H$

D. None

Answer: B

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74. Which of the following will not show geometrical isomerism ?

A. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH - CH_2 - CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH = CH - CH_2 - CH_3$

C. $CH_3 - CH = CH - CH_3$

D. $CH_3 - CH_2 = CH - CH_2 - CH_3$

Answer: A

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75. The two compounds shown below are :

A. diastereomers

B. enantiomers

C. epimers

D. regiomers

Answer: B

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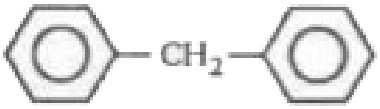
76. The molecular formula of diphenylmethane,



, is $C_{13}H_{12}$;

How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom ?

A. 6

B. 4

C. 8

D. 7

Answer: B

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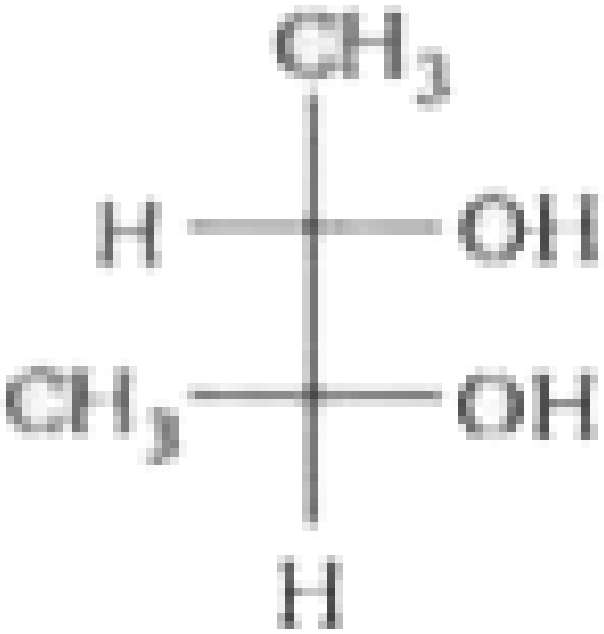
77. Correct configuration of the following molecule is :



A. 2S, 3S

B. 2S, 3R

C. 2R, 3S

D. 2R, 3R

Answer: A

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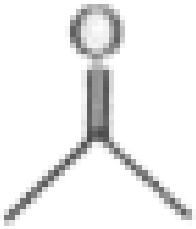
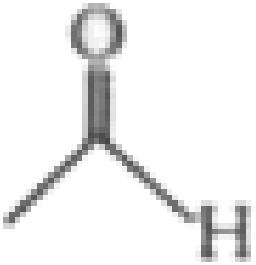
78. Maximum enol content is in :

A. 

B. 

C. 

D. 

Answer: D

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79. Which of the following will have one of the stereoisomer meso ?

A. 2-chlorobutane

B. 2, 3-dichlorobutane

C. 2,3-dichloropentane

D. 2-hydroxypropanoic acid

Answer: B

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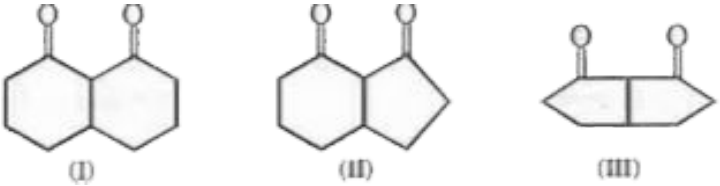
80. The correct decreasing order in the enol content of following molecules is :



A. $I > II > III$

B. $II > I > III$

C. $III > II > I$

D. $II > III > I$

Answer: A

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81. Total number of stereoisomers of the compound 1-bromo-3-chlorocyclobutane is:

A. 0

B. 1

C. 2

D. 3

Answer: C

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82. Total number of stereoisomers of the 1,3 dichlorocyclohexane is:

A. 0

B. 1

C. 2

D. 3

Answer: C

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83. Total number of stereoisomers of the compound 1, 4-dichlorocyclohexane is :

A. 0

B. 1

C. 2

D. 3

Answer: C

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84. Total number of stereoisomers of the compound 2-4-dichloroheptane is:

A. 0

B. 1

C. 2

D. 4

Answer: D

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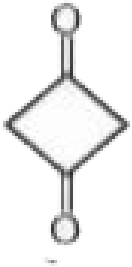
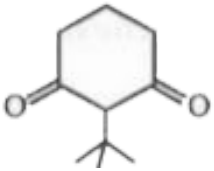
85. In which of the following keto form is more dominating than enol form:

A. 

B. 

C. 

D. all of these

Answer: D

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86. Among the following compounds, which will give maximum enol content in solution :

A. $C_6H_5 - \overset{\overset{O}{||}}{C} - CH_2 - \overset{\overset{O}{||}}{C} - C_6H_5$

B. $CH_3 - \overset{\overset{O}{||}}{C} - CH_2 - \overset{\overset{O}{||}}{C} - CH_3$

C. $CH_3 - \overset{\overset{O}{||}}{C} - CH_2 - CH_2 - CH_3$

D. $CH_3 - \overset{\overset{O}{||}}{C} - CH_2 - COOC_2H_5$

Answer: A

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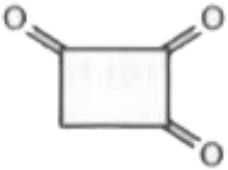
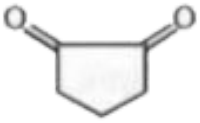
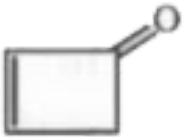
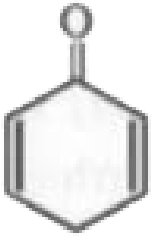
87. Which of the following has unstable enol form ?

A.



B. 

C. 

D. 

Answer: C

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88. Calculate enantiomeric excees of mixture containing 6g of (+) 2-butanol and 4g of (-) -2-butanol.

A. $10\ \%$

B. $20\ \%$

C. 40 %

D. 33 %

Answer: B

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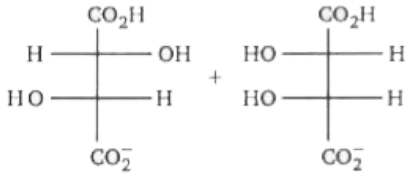
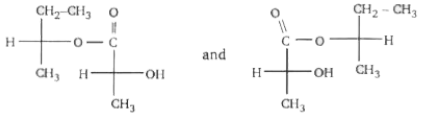
89. Which of the following pair represent pair of diastereomers ?

A. Meso tartaric acid and (l) tartaric acid



B.

C. 

D. All of these

Answer: D

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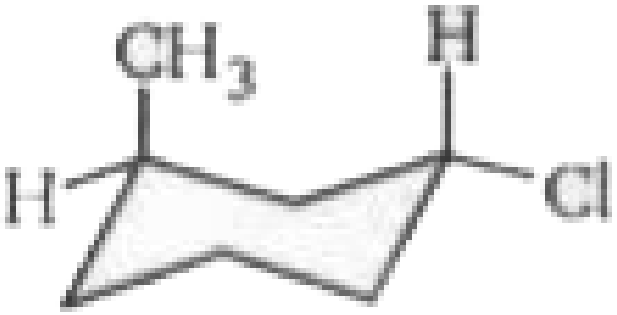
90. The stereochemistry of this molecule is :



A. 1R, 3R

B. 1R, 3S

C. 1S, 3S

D. 1S, 3R

Answer: A

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91. Pure (S)-2-butanol has a specific rotation of +13.52 degrees. A sample of 2-butanol prepared in the lab and purified by distillation has a calculated specific rotation of +6.76 degrees. What can you conclude about the composition ?

A. 50% (S), 50% impurity

B. 50% (S), 50% (R)

C. 50% (S), 50% racemic

D. some other mixture

Answer: C

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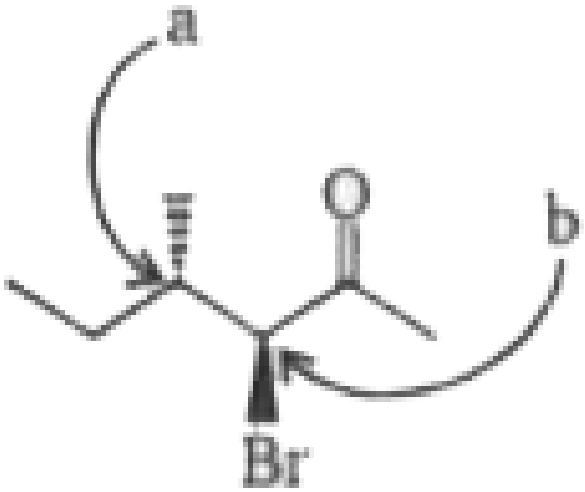
92. Determine the absolute configurations of the chiral centres in the following compound.



A. a=R, b=S

B. a = R, b=R

C. a =S, b=S

D. a =S, b=R

Answer: C

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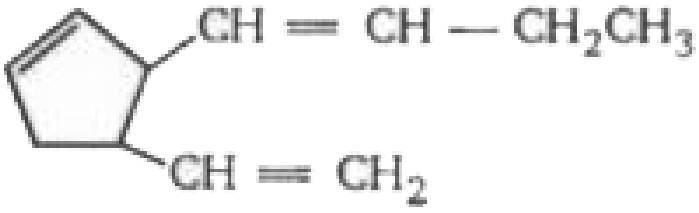
93. Total number of stereoisomers possible for following compound is :



A. 8

B. 16

C. 32

D. 64

Answer: A

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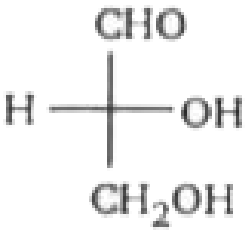
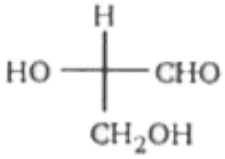
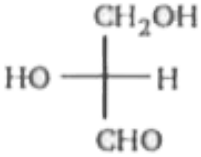
94. Which is the correct structure of D glyceraldehyde ?

A. 

B. 

C. 

D. All of these

Answer: D

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95. $HO-\underset{(3)}{CH_2}-\underset{(2)}{CH_2}-\underset{(1)}{\overset{\overset{O}{||}}{C}}-H$

Which conformer of above compound is most stable (consider

conformer across $(C_2 - C_3)$

A. Staggered

B. Gauche

C. Fully eclipsed

D. Partially eclipsed

Answer: B

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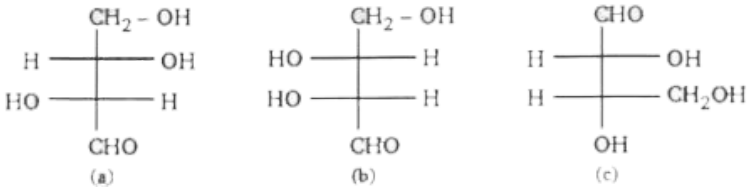
96.



(D) & (L)

Configuration of above carbohydrate is :

A. L, L, D

B. L, D, L

C. L, L, L

D. L, D, D

Answer: B

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97. How many isomers have the name bromomethylcyclopentane ? (ignoring chirality)

A. 4

B. 5

C. 6

D. 7

Answer: C

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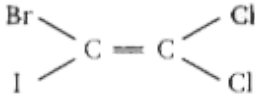
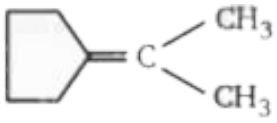
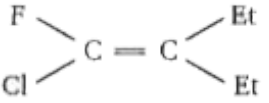
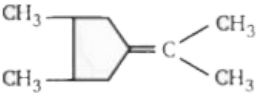
98. Which of the following compounds will show geometrical isomerism?

A. 

B. 

C. 

D. 

Answer: D

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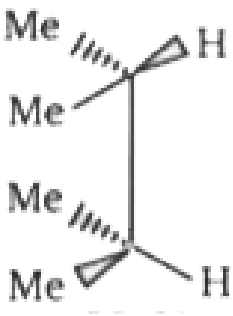
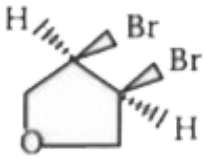
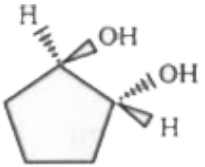
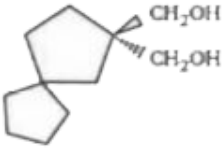
99. Which of the following structure represent meso-compound ?

A. 

B. 

C. 

D. 

Answer: B

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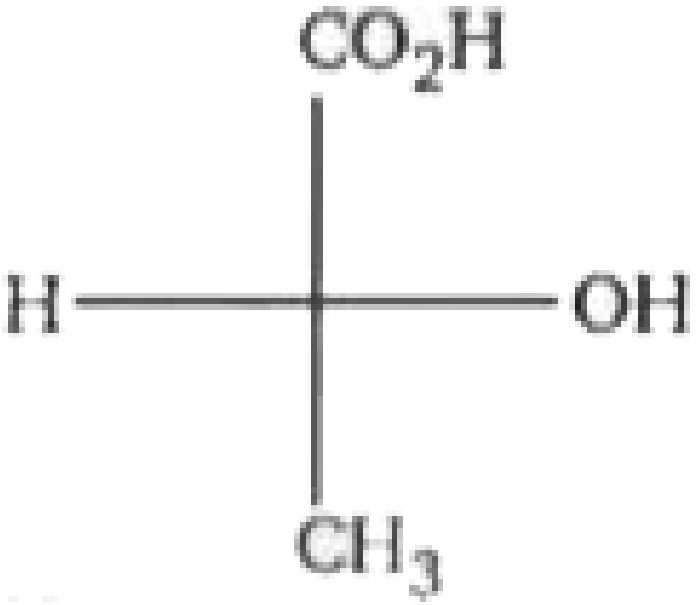

100.

How many representations of lactic acid are possible in Fischer projection (d &l)?

A. 8

B. 12

C. 24

D. 36

Answer: C

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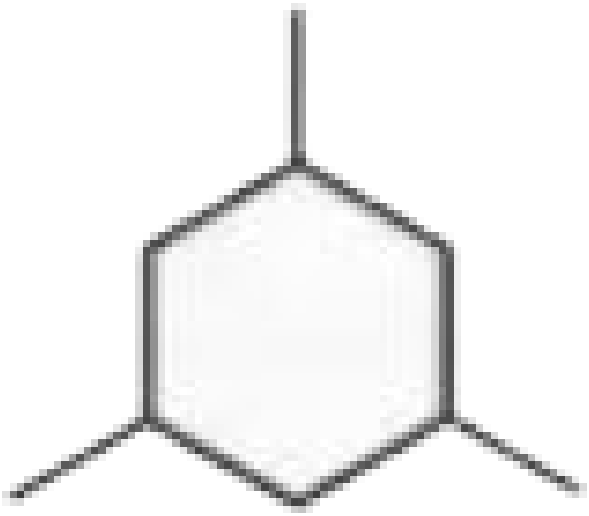
101. Total number of stereoisomer formed by the given compound is :



A. 2

B. 3

C. 4

D. 8

Answer: A

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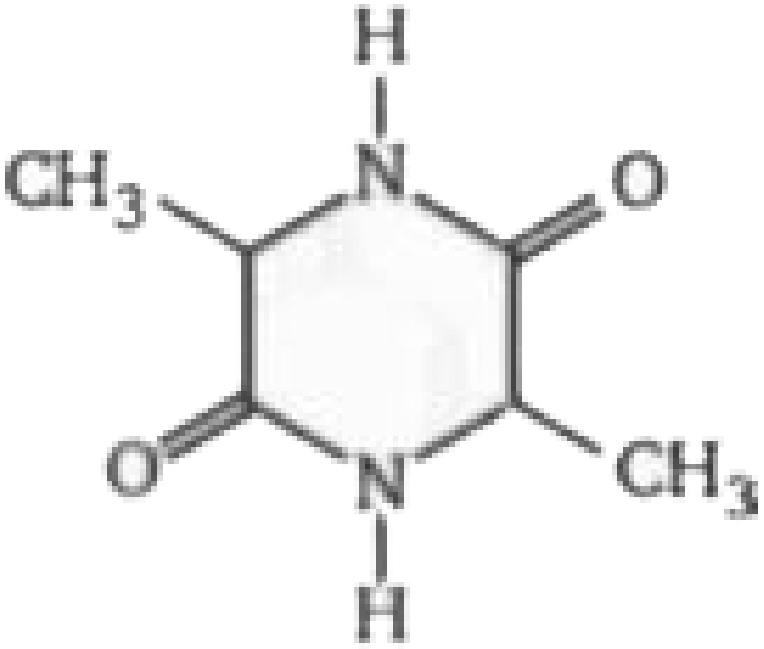
102. The number of stereoisomers formed by the given compound is :



A. 2

B. 3

C. 4

D. 5

Answer: B

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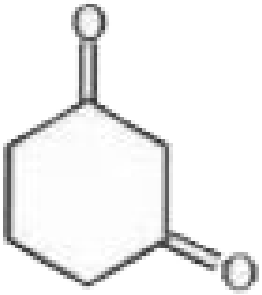
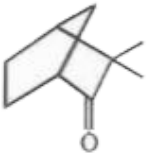
103. Which of the following compound does not undergo base - catalyzed exchange in D_2O even though it has an α-hydrogen?

A. 

B. 

C. 

D. both (b) & (c)

Answer: D

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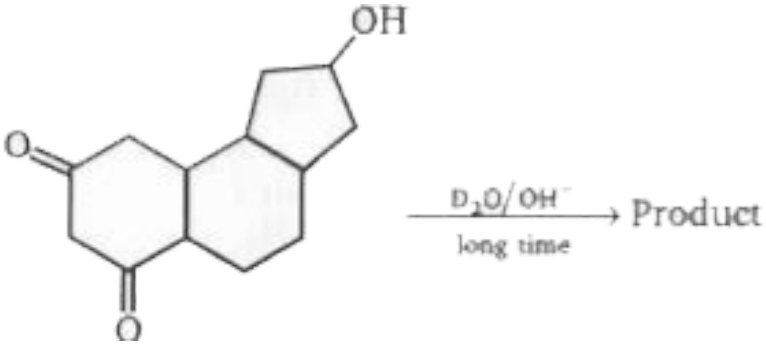
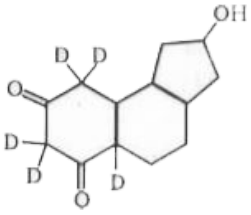
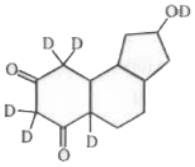
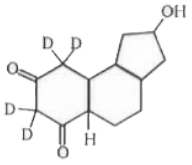
104. 

Identify the product formed in the above reaction:

A. 

B. 

C. 

D. None of these

Answer: B

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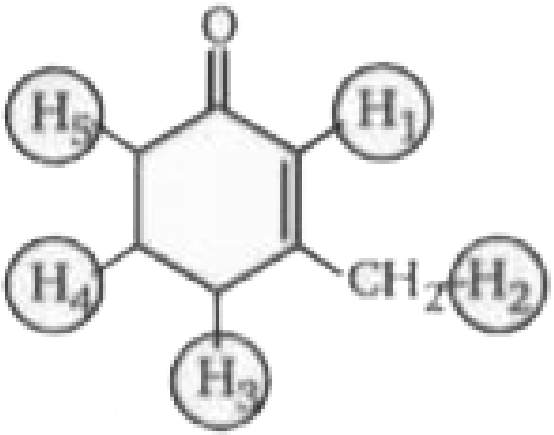
105. In 3-methyl-2-cyclohexenone which hydrogen cannot undergo deuterium exchange when it reacts with CH_3O^{Θ}/CH_3OD ?



A. H_1, H_4

B. H_4

C. H_3, H_2

D. H_5, H_3

Answer: B

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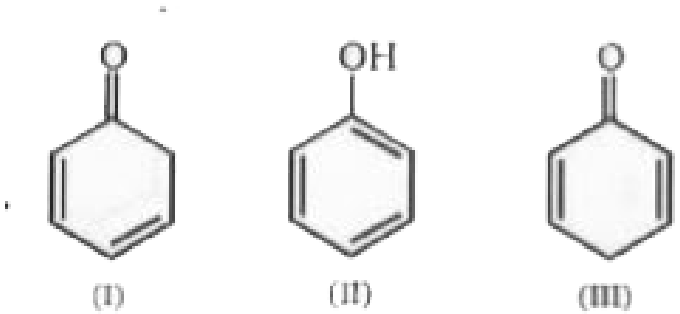

106.

The tautomer of II is :

A. I

B. III

C. both I and III

D. none of these

Answer: C

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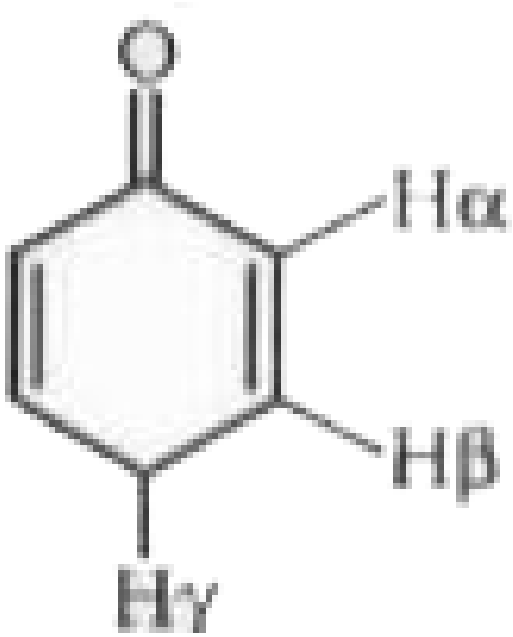
107.



In the enolization of the given molecule, the H-atom involved is :

A. $\alpha - H$

B. $\beta - H$

C. $\gamma - H$

D. cannot be enolized

Answer: C

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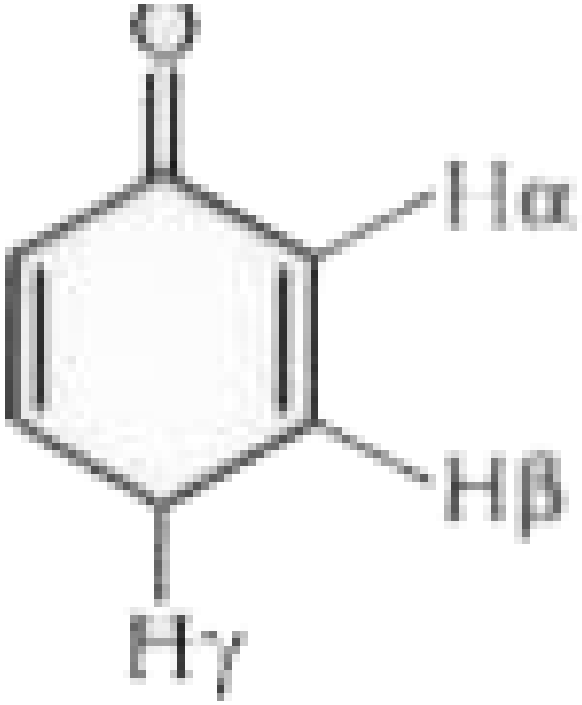
108.



Among the given structure which hydrogen can exhibit tautomerism ?

A. alpha

B. beta only

C. gama

D. none of these

Answer: B

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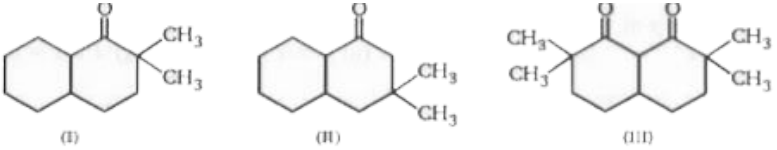
109.



Identify the which can exhibit tautomerism ?

A. I only

B. II only

C. III only

D. all of these

Answer: D

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110. $CH_3 - CHO$ and $CH_2 = CH - OH$ Between the two tautomers which is more stable ?

A. I

B. II

C. I = II

D. none of these

Answer: A

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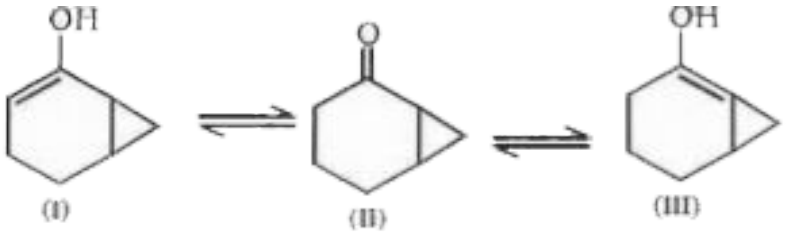
111.



Correct stability order of the given tautomers is :

A. $I > II > III$

B. $III > II > I$

C. $II > I > III$

D. $II > III > I$

Answer: C

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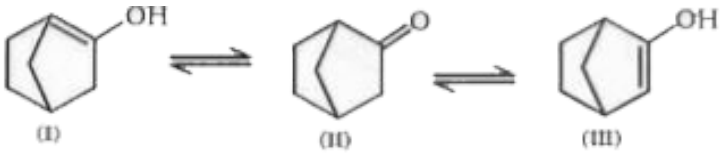
112.



Correct stability order of the given tautomers is :

A. $I > II > III$

B. $III > II > I$

C. $II > I > III$

D. $II > III > I$

Answer: D

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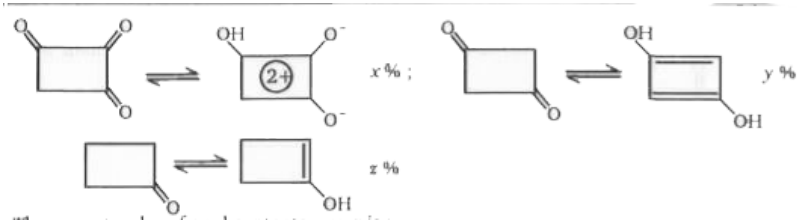
113. 

The correct order of enol contents x, y, z is :

A. $x > y > x$

B. $z > y > x$

C. $y > x > z$

D. $x > z > y$

Answer: D

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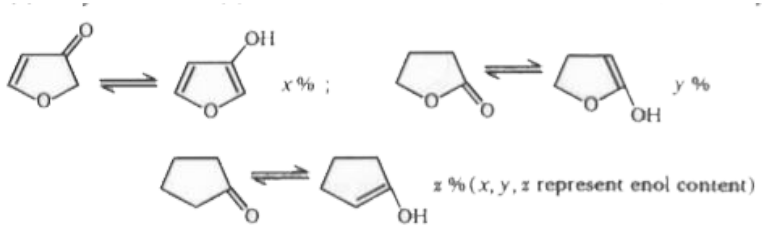
114.



(x, y, z represent enol content)

The correct order of x, y, z is :

A. $x > y > z$

B. $z > y > x$

C. $y > x > z$

D. $x > z > y$

Answer: D

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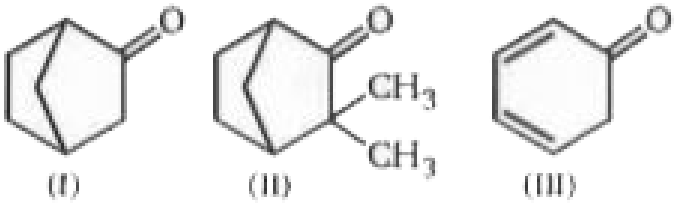
115. 

(I) (II) (III)

Among the given ketones, the one which does not enolize is :

A. I

B. II

C. III

D. none of these

Answer: B

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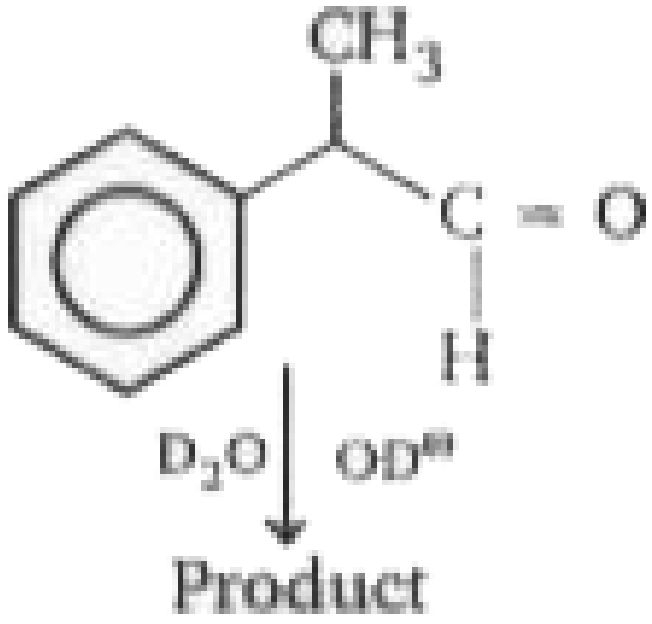
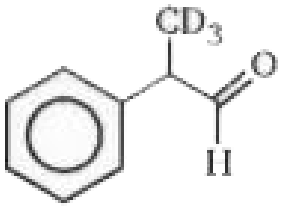
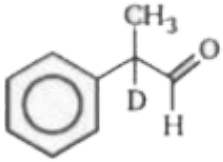
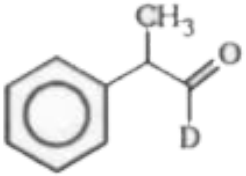


116.

The product of this reaction should be :

A. 

B. 

C. 

D. All of these

Answer: B

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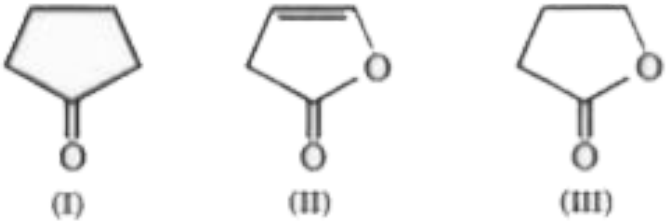
117. 

Among the given compounds, the correct order of enol content is :

A. $I > II > III$

B. $III > II > I$

C. $II > I > III$

D. $II > III > I$

Answer: C

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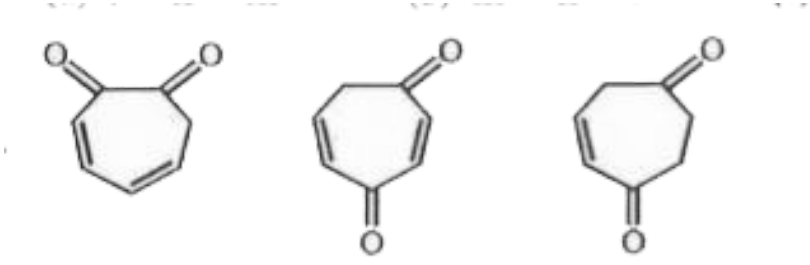

118.

Among the given compounds, the correct order of enol content is :

A. $I > II > III$

B. $III > II > I$

C. $II > I > III$

D. $II > III > I$

Answer: A

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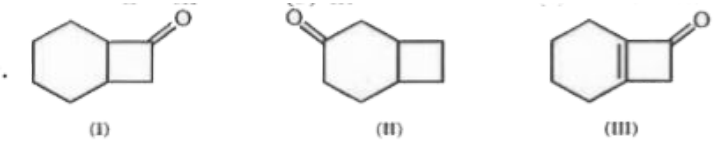
119.



Among the given compounds, the correct order of enol content is :

A. $I > II > III$

B. $III > II > I$

C. $III > I > II$

D. $II > I > III$

Answer: D

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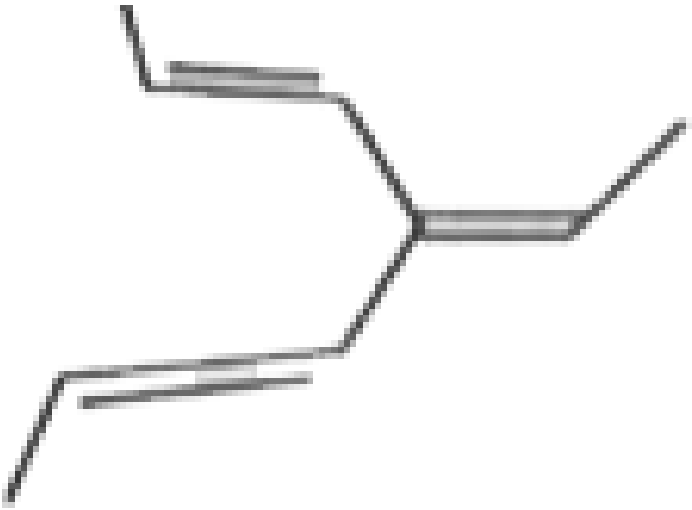
120. 

How many geometrical isomers are possible for the above compound ?

A. 3

B. 4

C. 6

D. 8

Answer: B

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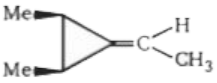
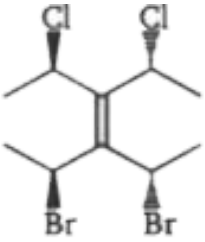
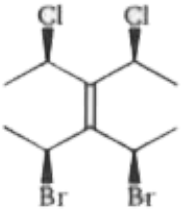
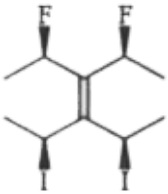
121. Which of the following compound will not show geometrical isomerism across the it π-bond ?

A. 

B. 

C. 

D. 

Answer: B

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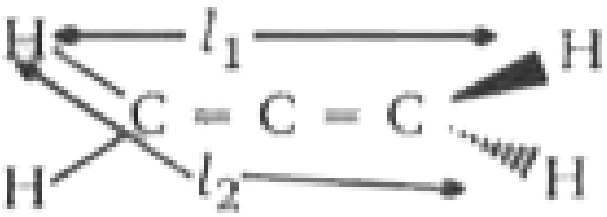

122.

Choose the correct relation between l_1 and l_2 ?

A. $l_1 = l_2$

B. $l_1 > l_2$

C. $l_1 < l_2$

D. $l_2 = 2l_1$

Answer: A

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123.

Choose the correct relation between l_1 and l_2 ?

A. $l_1 = l_2$

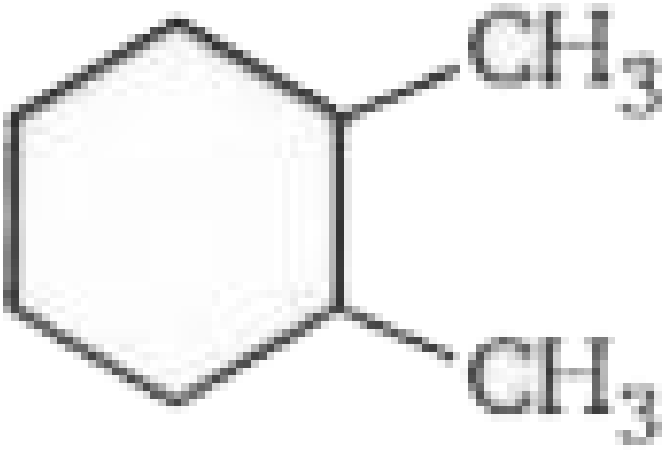
B. $l_1 > l_2$

C. $l_1 < l_2$

D. $l_2 = 2l_1$

Answer: C

Watch Video Solution



124.

How many geometrical isomers are possible for the above compound ?

A. 0

B. 2

C. 3

D. 4

Answer: B

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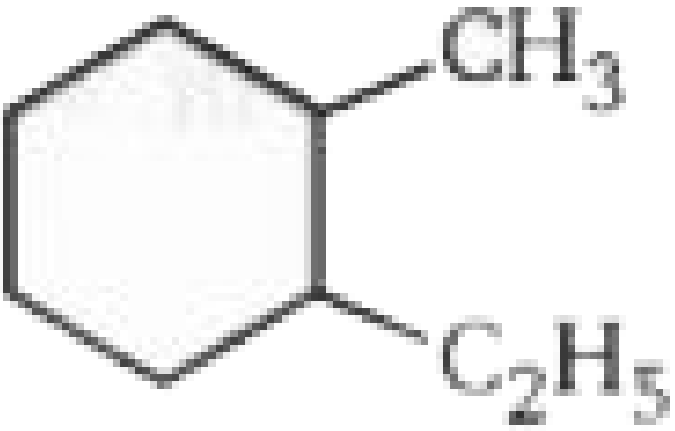

125.

How many geometrical isomers are possible for the above compound ?

A. 0

B. 2

C. 3

D. 4

Answer: B

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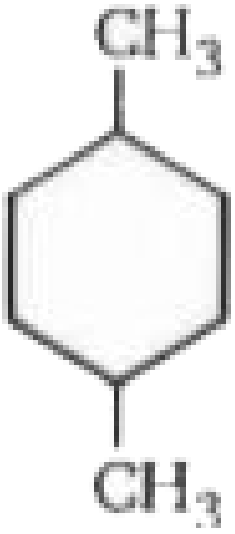
126.



How many geometrical isomers are possible for the above compound ?

A. 0

B. 2

C. 3

D. 4

Answer: B

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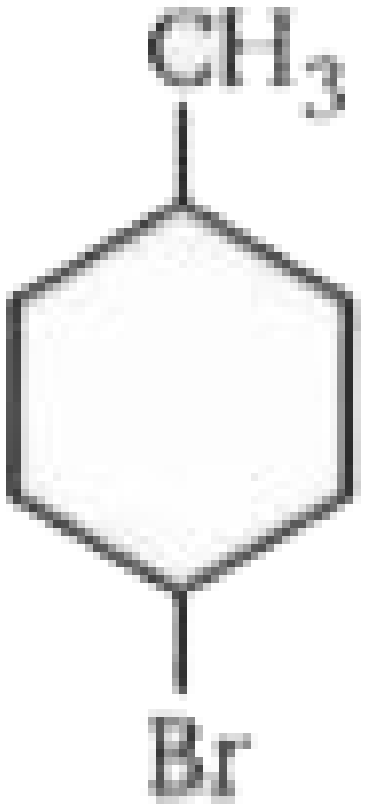
127.



How many geometrical isomers are possible for the above compound ?

A. 0

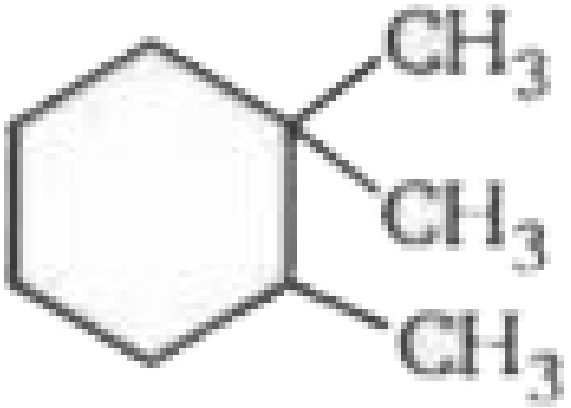
B. 2

C. 3

D. 4

Answer: B

Watch Video Solution



128.

How many geometrical isomers are possible for the above compound ?

A. 0

B. 2

C. 3

D. 4

Answer: A

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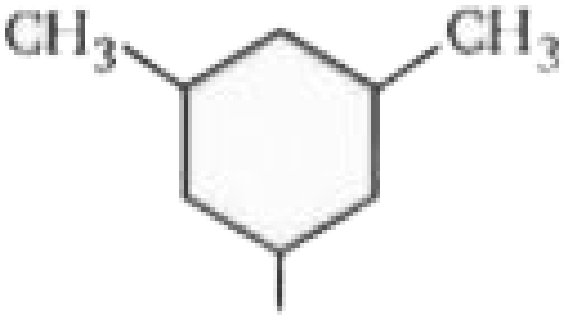


129.

How many geometrical isomers are possible for the above compound ?

A. 0

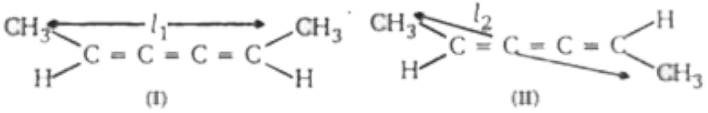
B. 2

C. 3

D. 4

Answer: B

Watch Video Solution



130.

I and II are geometrical isomers of each other because

A. $l_1 = l_2$

B. $l_1 > l_2$

C. $l_2 > l_1$

D. l_1 and l_2 cannot be compared.

Answer: C

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131. $CH_2 = CH - CH = CH - CH = CH_2$

How many geometrical isomers are possible for this compound ?

A. 2

B. 3

C. 4

D. 8

Answer: A

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132. $CH_3 - CH = \underset{\underset{Br}{|}}{C}\underset{\underset{Cl}{|}}{C}H - CH_2 - CH_3$

How many geometrical isomers are possible for this compound?

A. 2

B. 3

C. 4

D. 6

Answer: C

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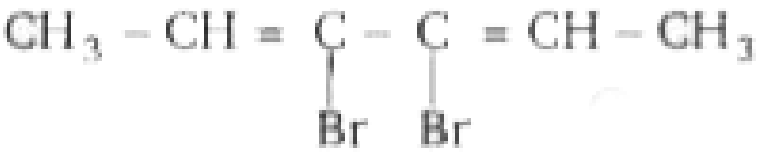

133.

How many geometrical isomers of this compound are possible ?

A. 2

B. 3

C. 4

D. 6

Answer: B

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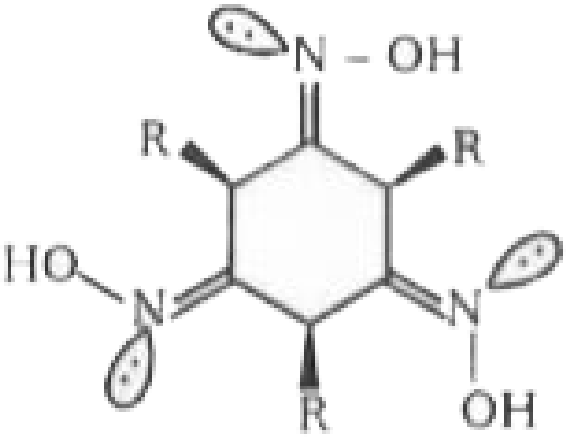

134.

A. chiral

B. C_3 axis of symmetry

C. Optically active

D. All of these

Answer: D

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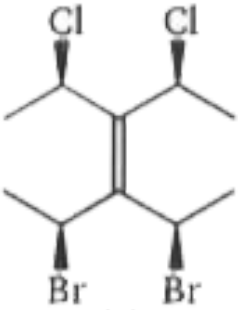
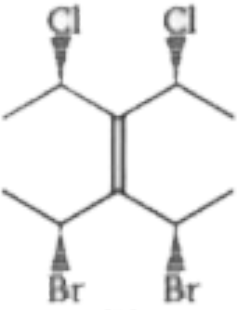


(A)



(B)

135.

Relationship between above pair (A) & (B) is :

A. Enantiomer

B. Diastereomers

C. Identical

D. Structural isomer

Answer: C

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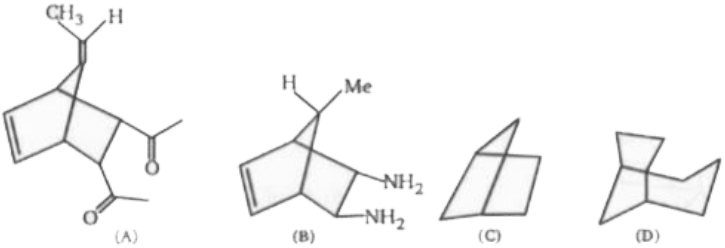

136.

From above compound (A), (B), (C) & (D) chiral compound is :

A. A

B. B

C. C

D. D

Answer: A

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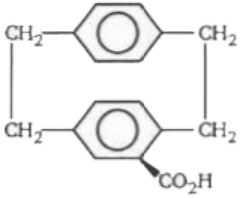
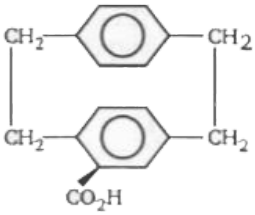
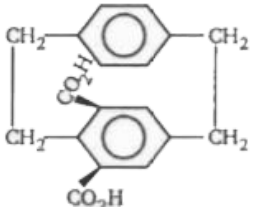
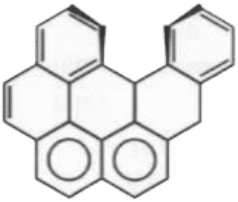
137. Which of the following molecules is achiral?

A. 

B. 

C. 

D. 

Answer: C

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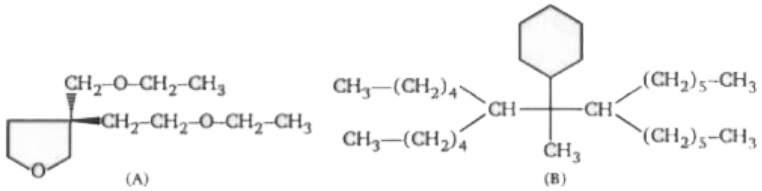
138. 

R and S configuration of compound (A) & (B) will be :

A. R, R

B. R, S

C. S, R

D. S, S

Answer: D

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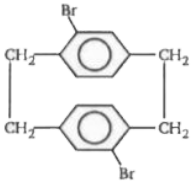
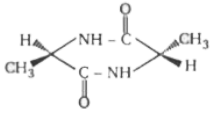
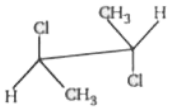
139. Which of following compound has center of symmetry?

A. 



B.



C.

D. All of these

Answer: D

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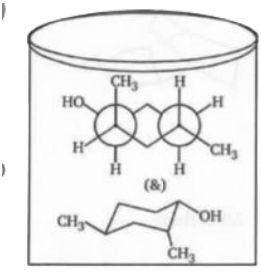
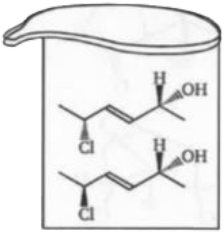
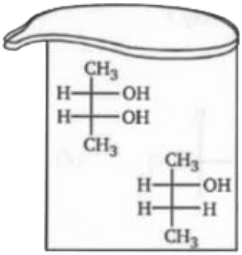
140. Which mixture of structure in each beaker would rotate plane polarized light ?

A.



B. 

C. 

D. All of these

Answer: D

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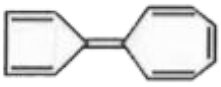
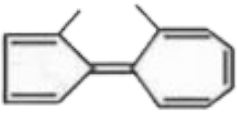
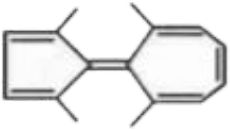
141. Which of following compound will rotate the plane polarized light at room temperature?

A. 

B. 

C. 

D. 

Answer: B

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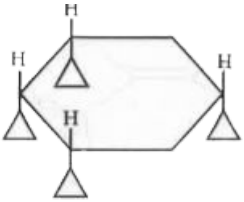
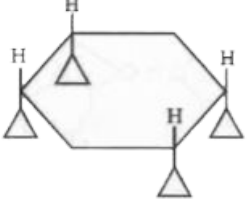
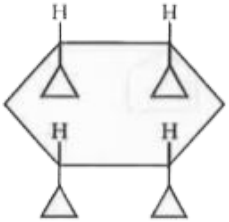
142. Which of the following having plane of symmetry?

A. 

B.



C.



D. All of these

Answer: D

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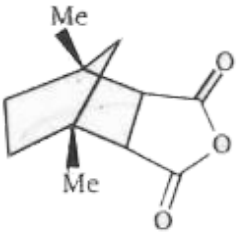
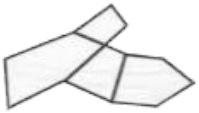
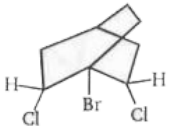
143. Which of following compound is achiral ?

A.





B.



C.

D. All of these

Answer: D

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144. Which of the following compound has plane of symmetry ?

$$R = -\underset{CH_3}{\underset{|}{CH}} - CH \qquad S = -\underset{Br}{\underset{|}{CH}} - Cl$$

A.

B.

C.

D. None of these

Answer: D

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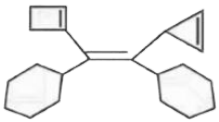
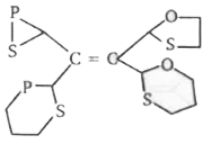
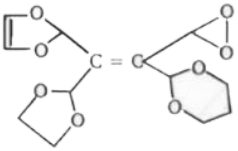
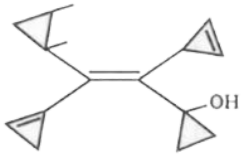
145. Which of following is E isomer ?

A.



B. 

C. 

D. 

Answer: D

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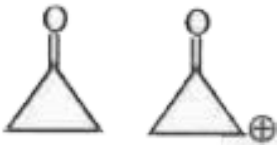
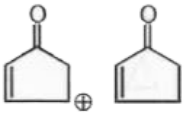
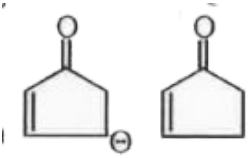
146. Among the given pairs, in which pair second compound has less enol content than first compound?

A. 

B. 

C. 

D. none of these

Answer: C

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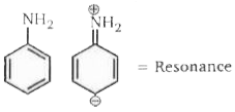
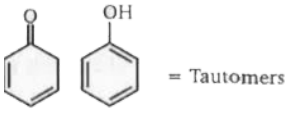
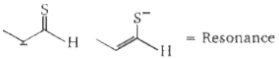
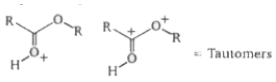
147. Which of the following is incorrect relation between given pairs ?

A. 

B. 

C. 

D. 

Answer: D

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148. $Ph-\underset{\underset{(A)}{OH}}{\underset{|}{CH}}-\overset{\overset{O}{||}}{C}-O-H$, (A) and (B) are isomer and isomerization effectively carried out by trace of base (B). Identify (B).

A. $Ph-CH_2-\overset{\overset{O}{||}}{C}-O-H$

B. $Ph-\overset{\overset{O}{||}}{C}-O-CH_3$

C. $Ph-\overset{\overset{O}{||}}{C}-CH_2-OH$

D. $H-\overset{\overset{O}{||}}{C}-CH_2-O-Ph$

Answer: C

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149. $CH_3 - CH = CH - CH = CH - CH_3$, total number of geometrical isomer is :

A. 2

B. 3

C. 4

D. 6

Answer: B

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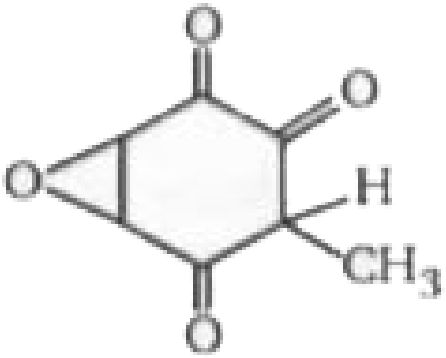
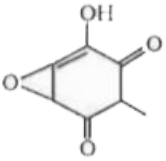
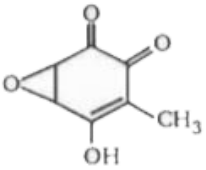
150. Identify most stable enol form of terric acid:



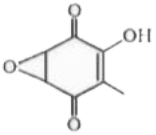
A.

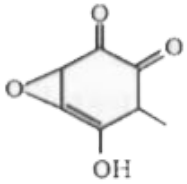


B.



C.





D.

Answer: C

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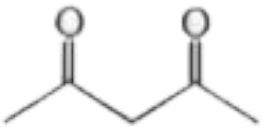
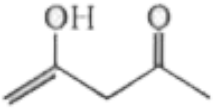
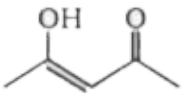
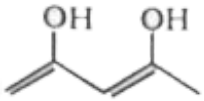
151. Which structure is most stable ?

A. 

B. 



C.

D. 

Answer: C

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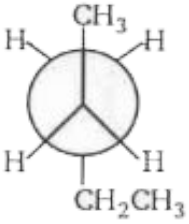
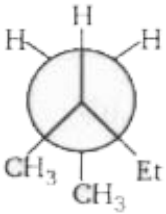
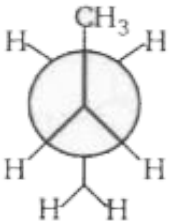
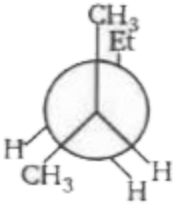
152. Identify conformer of 2-methly pentane :

A. 

B. 



C.



D.

Answer: D

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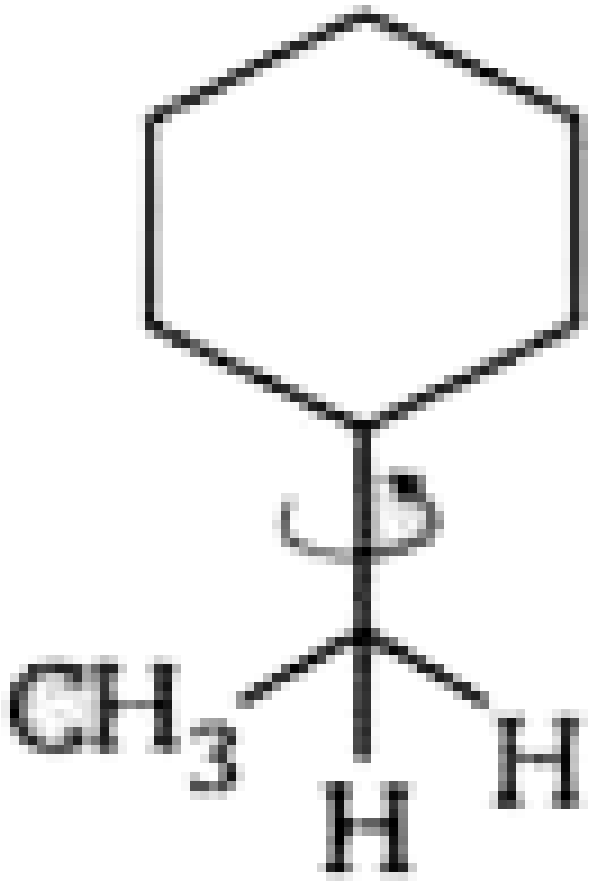
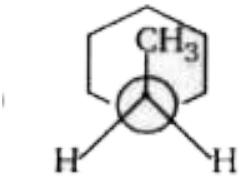
153. The lowest energy conformer of

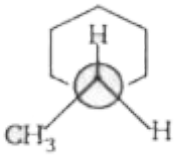


is:

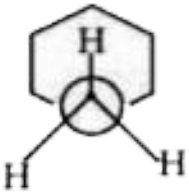
A.



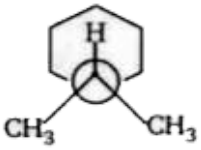
B.



C.



D.



Answer: B

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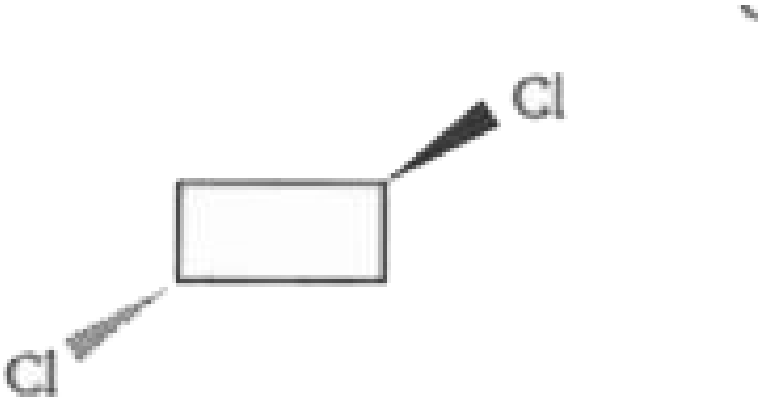

154.

How many atoms will bisect during plane of symmetry ?

A. 2

B. 4

C. 6

D. 8

Answer: C

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155. The number of all types of isomers of chlorobutane is :

A. 2

B. 4

C. 6

D. 5

Answer: D

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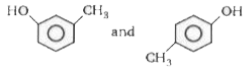
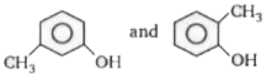
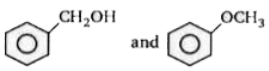
156. Which of the following pairs of compounds are not positional isomers ?

A. 

B. 

C. 

D. All of these

Answer: C

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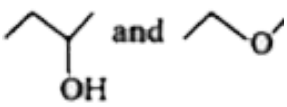
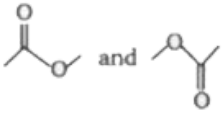
157. Which of the following pairs of compounds are functional isomers ?

A. 

B. 

C. 

D. 

Answer: B

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158. The isomeric alcohol which has a chiral carbon atom is:

A. n-butyl alcohol

B. iso-butyl alcohol

C. sec-butyl alcohol

D. tert-butyl alcohol

Answer: C

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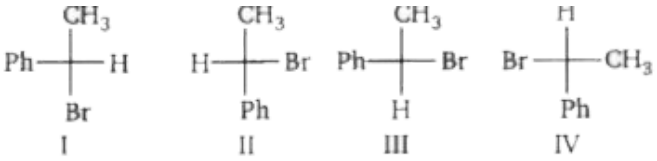
159. The pair of enantiomers among the following compound is:



A. I and IV

B. II and IV

C. II and III

D. I and II

Answer: C

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160. Which of the following is chiral?

A. A) Cell phone

B. B) Spiral staircase

C. C) Scissor

D. D) All of these

Answer: D

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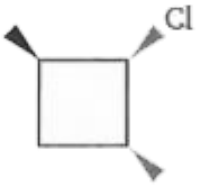
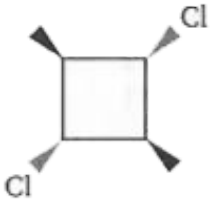
161. In which of the following compound, possess plane of symmetry as well as centre of symmetry?

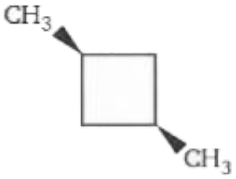
A. A)



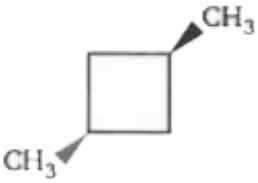
B. B)



C. C)



D. D)



Answer: D

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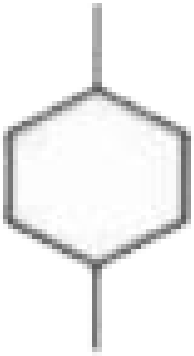
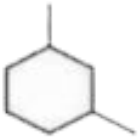
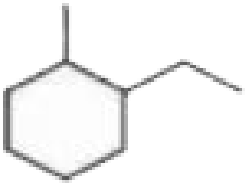
162. Which of the following compound has one of the stereoisomers as a meso compound?

A. 

B. 

C. 

D. 

Answer: B

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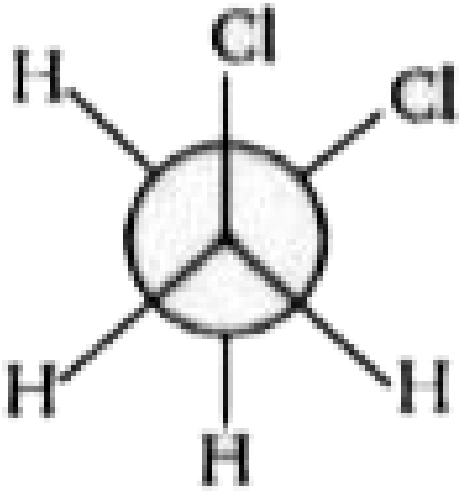
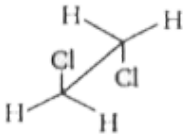
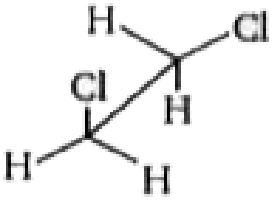
163. For the following Newman projection



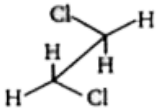


A. A)

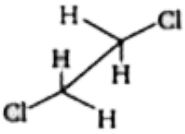
B. B)



C. C)



D. D)



Answer: B

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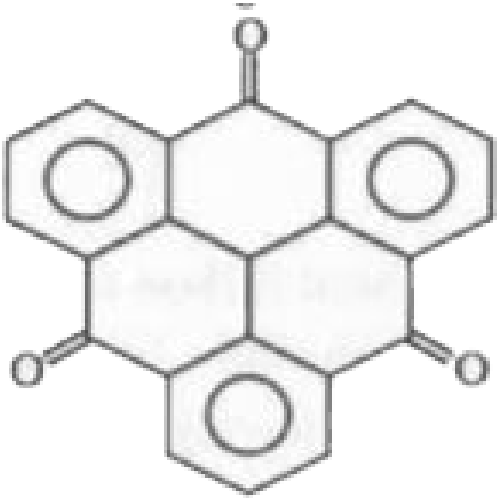
164. Which of the following is correct for the given compound?



A. It possess centre of symmetry

B. It possess C_4 axis of symmetry

C. It possess plane of symmetry

D. compound is chiral

Answer: C

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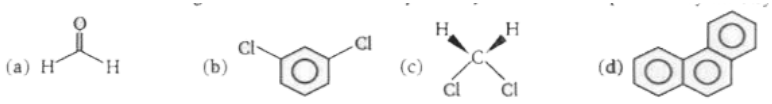
165. Which of the following molecules has axis of symmetry and a coaxial plane of symmetry?



(e) All of these

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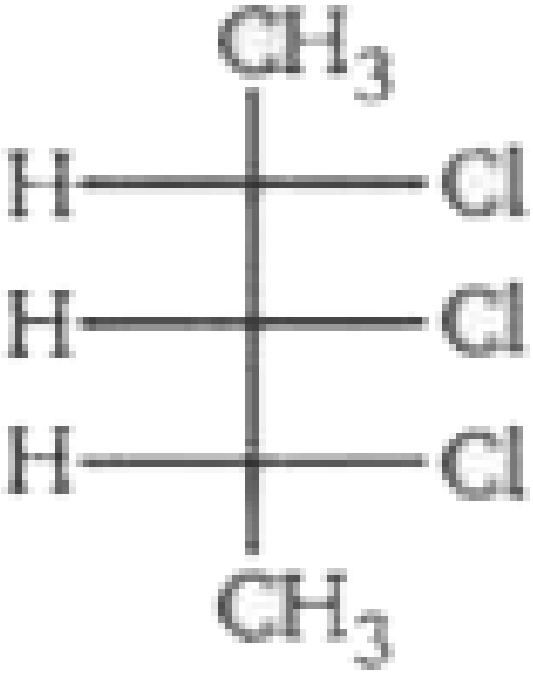
166. Number of diastereomer of given compound :



A. 2

B. 3

C. 4

D. 6

Answer: B

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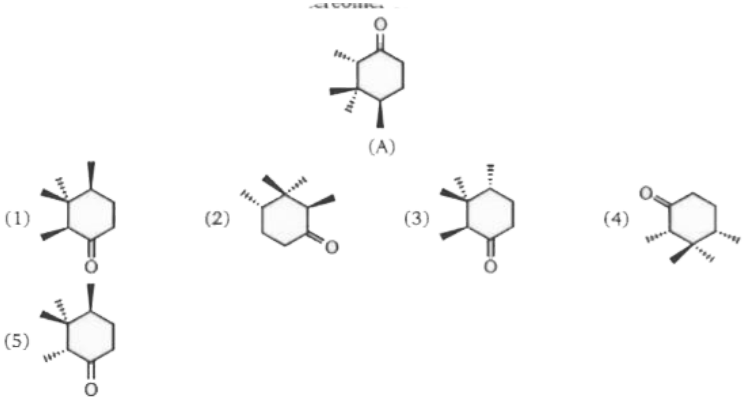
167. Which of the structures is/are diastereomer of A ?



A. 3

B. 1 and 4

C. 2 and 3

D. 5

Answer: B

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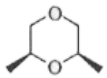
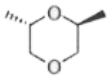
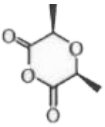
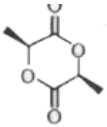
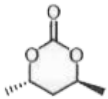
168. Identify which of the structures below are meso structures ?

(1) 

(2) 

(3) 

(4) 

(5) 

A. 1 and 3

B. 1,3 and 5

C. 1,3 and 4

D. 2 and 5

Answer: A

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169. How many enol form is possible for $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - CH_2 - CH_3$ (including stereoisomers) will be ?

A. 2

B. 3

C. 4

D. 5

Answer: C

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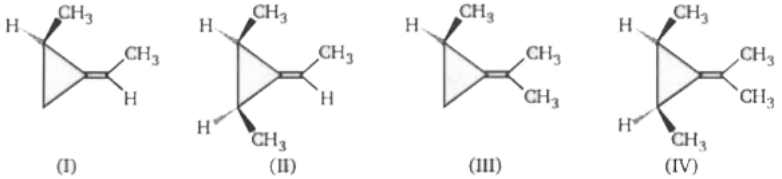
170. Find the sum of all the stereocenters that are present in below compounds :



A. 8

B. 9

C. 10

D. 11

Answer: C

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171. A pair of stereoisomers might be classified in various ways. Which of the following statement are true with respect to pairs of stereoisomers ?

(a) They might be configurational isomers

(b) They might be diastereomers

(c) They might be constitutional isomers

(d) They might be tautomers .

(e) They might be conformational isomers

(f) They might be enantiomers

(g) They might be positional isomers

A. a, b, f, e

B. b, d, e, f, g

C. a, b, f

D. a, b, c, f

Answer: C

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172. Ignoring specific markings, which of the following objects are chiral ?

(I) a shoe (II) a book (III) a pencil

(IV) a pair of shoes (consider the pair as one object) (V) a pair of scissors

A. A) I only

B. B) I & V

C. C) I, IV, V

D. D) III, IV, V

Answer: B

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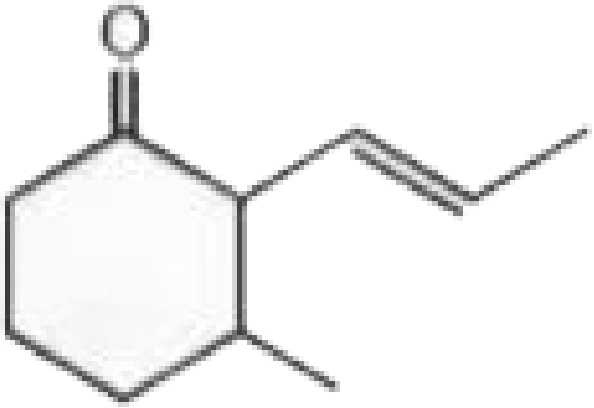
173. Calculate the total number of stereoisomers when alkene having trans configuration :



A. A) 2

B. B) 3

C. C) 4

D. D) 8

Answer: C

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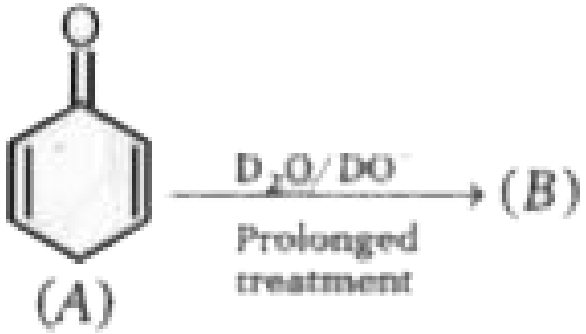
174.



After prolonged treatment of (A) by D_2O/DO^-, the difference in molecular weights of compounds (A) and (B) is :

A. A) 2

B. B) 3

C. C) 4

D. D) 8

Answer: C

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175. 

A mixture of all isomers possible from the mono-chlorination of the structure is subjected to fractional distillation, then how many fractions will be obtained?

A. A) 2

B. B) 3

C. C) 4

D. D) 5

Answer: B

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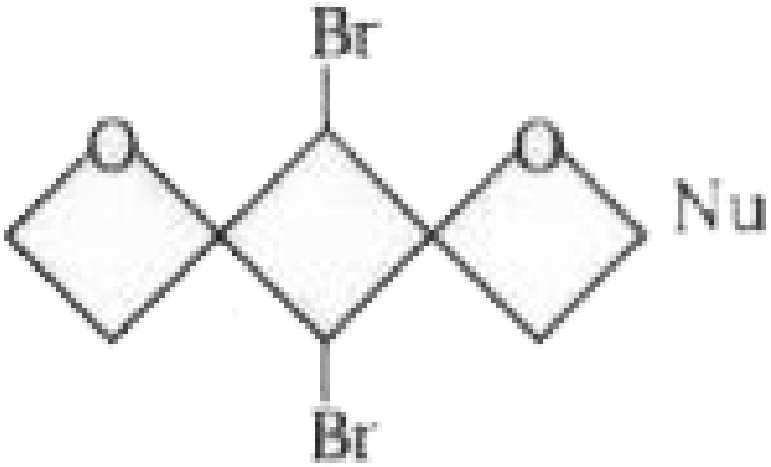

176. Number of optically active isomer is/are :

A. 0

B. 1

C. 2

D. 3

Answer: A

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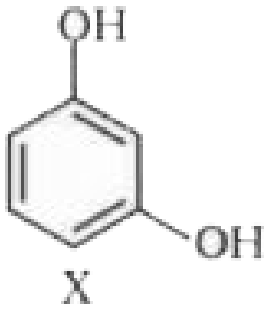
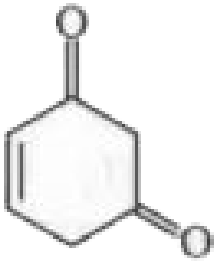
177. At normal temperature, X and Y



X



Y

A. resonance structures

B. tautomers

C. functional isomers

D. positional isomers

Answer: B

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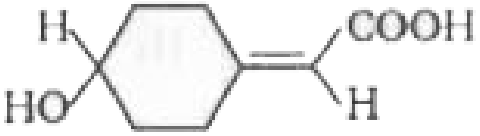
178. Two possible stereoisomers for



are

A. A) enantiomers

B. B) diastereomers

C. C) conformers

D. D) rotamers

Answer: A

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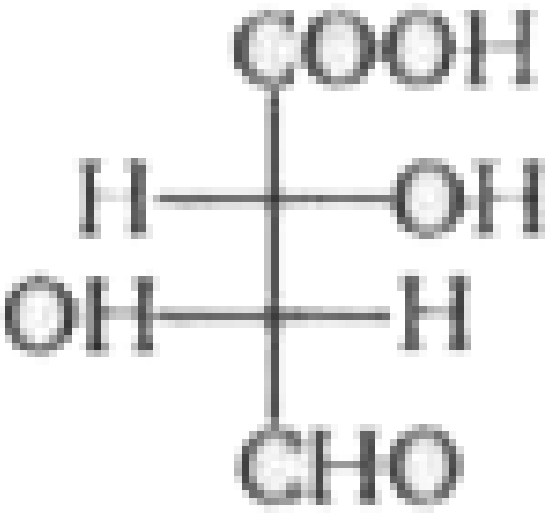
179. The configurations of the carbon atoms C_2 and C_3 in the following compound are respectively



A. A) R, R

B. B) S, S

C. C) R, S

D. D) S,R

Answer: A

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180. The compound that is chiral is

A. 3-methyl-3-hexene

B. 4chloro-1-methycyclohexane

C. 2-phenylpentane

D. 1,3-disopropylbenzene

Answer: C

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181. Number of optically active tartaric acid is/are possible :

A. A) 1

B. B) 2

C. C) 3

D. D) 4

Answer: B

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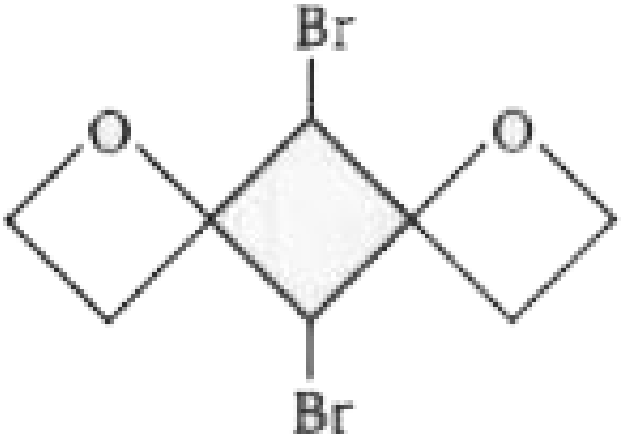

182. Number of optically active isomer is/are :

A. 0

B. 1

C. 2

D. 3

Answer: A

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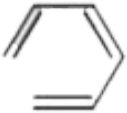
183. Correct relationship b/w pair of compounds.

(1)  and 

(2)  and 

(3)  and 

A. 1-Conformer, 2-Conformer , 3-Conformer

B. 1-Conformer, 2-Stereoisomers (GI) , 3-Stereoisomers (GI)

C. 1-Conformer , 2-Stereoisomers (GI), 3-Conformer

D. 1-Stereoisomerism (GI) , 2- Stereoisomerism (GI) , 3-Conformer

Answer: C

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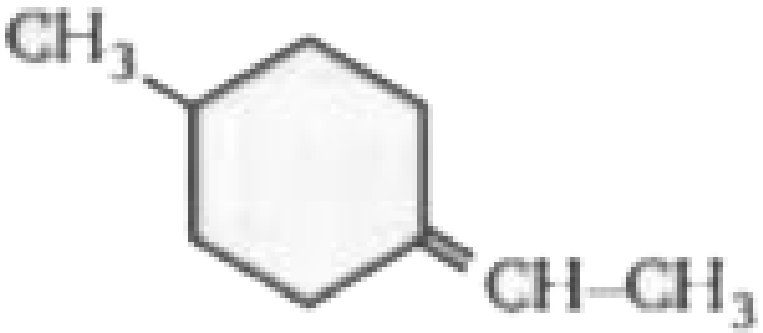
184. Number of diastereomers possible for



A. A) 1

B. B) 2

C. C) 4

D. D) 0

Answer: D

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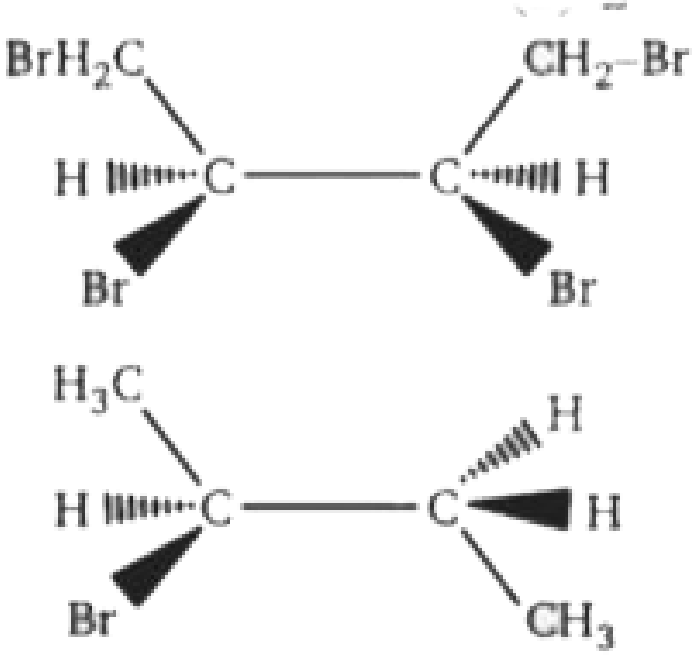

185.

Sum X + Y = ?

A. 1

B. 2

C. 3

D. 4

Answer: D

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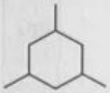
Level 2

1. Match the Column (I) and (II).

Column (I)		Column (II)	
Reaction		Stereoisomers	
(a)	$CH_3-CH=CH-CH=N-OH$	(p)	2
(b)		(q)	4
(c)	$CH_3-CH=CH-CH=CH-CH=CH-CH_3$	(r)	6
(d)	$CH_3-CH=CH-CH=CH-CH=CH-Ph$	(s)	8

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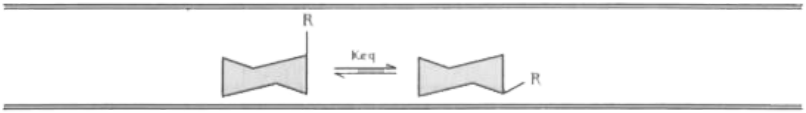
2. Match the Column (I) and (II).



Column (I)		Column (II)	
Group		Equilibrium Constant	
(a)	R = —H	(p)	38
(b)	R = —CH_3	(q)	23
(c)	R = —Et	(r)	18
(d)	R = —CH(—CH_3)—CH_3	(s)	1

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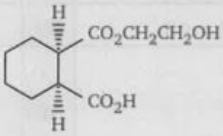
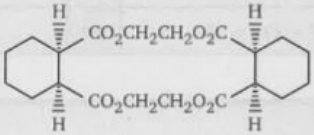
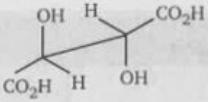
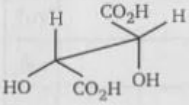
3. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Molecule		Nature	
(a)		(p)	Chiral
(b)		(q)	Achiral
(c)		(r)	Meso
(d)		(s)	Compound containing even number of chiral centers

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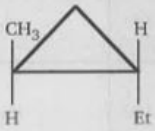
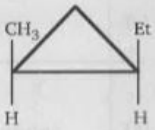
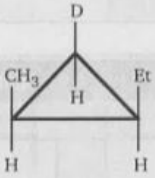
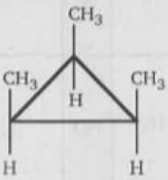
4. Match the Column (I) and (II), (Matrix)

Column (I)		Column (II)	
Compound		Isomerism	
(a)		(p)	Geometrical isomerism
(b)		(q)	Optical isomerism
(c)		(r)	Compound containing plane of symmetry
(d)		(s)	Compound containing center of symmetry

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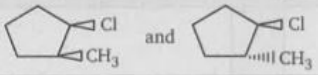
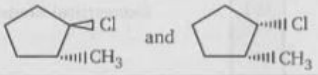
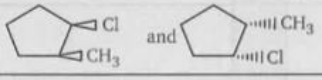
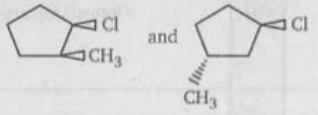
5. Match the Column (I) and (II).

Column (I)		Column (II)	
Molecules		Relationship	
(a)		(p)	Identical
(b)		(q)	Enantiomer
(c)		(r)	Diastereomer
(d)		(s)	Structural Isomerism

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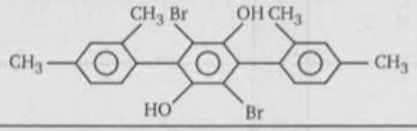
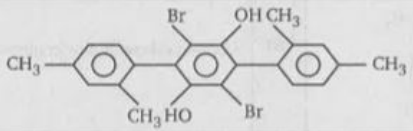
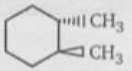
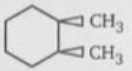
6. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Compound		Nature	
(a)		(p)	*cis*-compound
(b)		(q)	*trans*-compound
(c)		(r)	Optically active
(d)		(s)	Optically inactive

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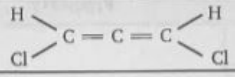
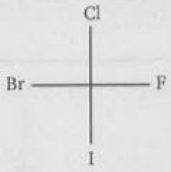
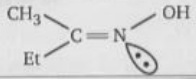
7. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Molecule		Property	
(a)		(p)	Chiral centers containing compound
(b)		(q)	Presence of stereocenter
(c)		(r)	Optically active compound
(d)		(s)	Compound containing plane of symmetry

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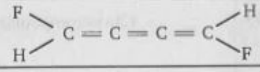
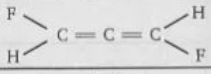
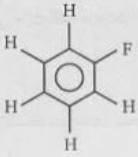
8. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Molecule		Property	
(a)		(p)	Polar molecule
(b)		(q)	Optically active
(c)		(r)	Optically inactive
(d)		(s)	Plane of symmetry

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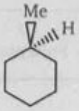
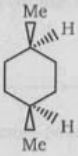
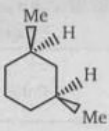
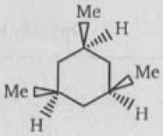
9. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Molecule		Property	
(a)		(p)	Meso compound
(b)		(q)	Achiral
(c)		(r)	Chiral compound
(d)		(s)	Compound will show geometrical isomerism

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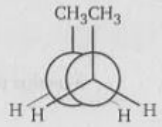
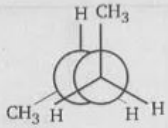
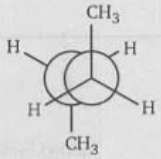
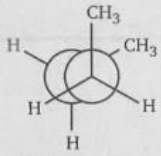
10. Match the Column (I) and (II).

Column (I)		Column (II)	
Modified Newmann Projection		Conformers	
(a)		(p)	Fully eclipsed
(b)		(q)	Partially eclipsed
(c)		(r)	Gauche
(d)		(s)	Staggered

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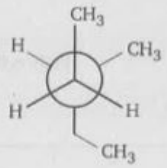
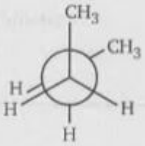
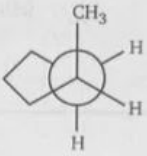
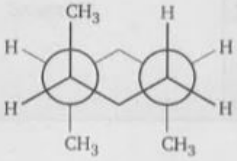
11. Match the Column (I) and (II).

Column (I)		Column (II)	
Newmann Projection		Name of the Compound	
(a)		(p)	3-methyl pentane
(b)		(q)	*n*-butane
(c)		(r)	Methyl-cyclopentane
(d)		(s)	1,2,4-trimethyl cyclohexane

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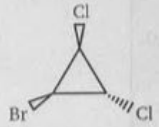
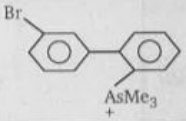
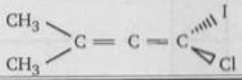
12. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Molecule			Property
(a)		(p)	Rotates plane polarized light
(b)		(q)	Cannot rotate plane polarized light
(c)		(r)	Plane of symmetry
(d)		(s)	Centre of symmetry

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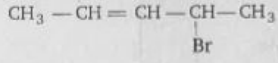
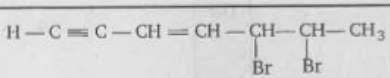
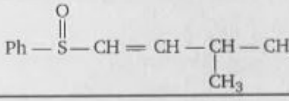
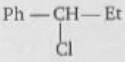
13. Match the Column (I) and (II).

Column (I)		Column (II)	
Molecule			Stereocenters
(a)		(p)	1
(b)		(q)	2
(c)		(r)	3
(d)		(s)	4

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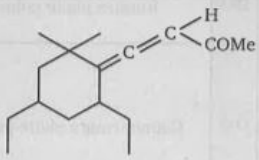
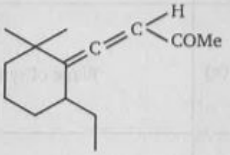
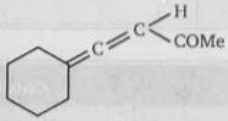
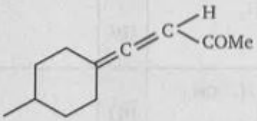
14. Match the Column (I) and (II).

Column (I)		Column (II)	
Molecule		Stereoisomers	
(a)		(p)	2
(b)		(q)	0
(c)		(r)	4
(d)		(s)	8

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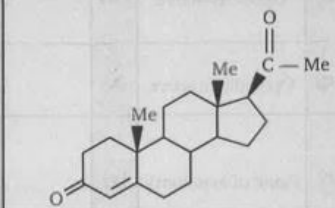
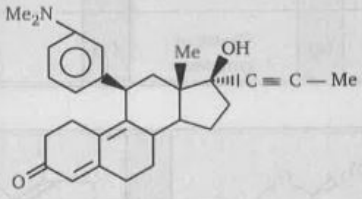
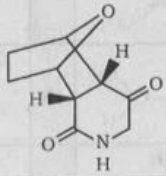
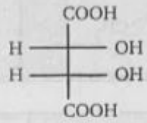
15. Match the Column (I) and (II). (Matrix)

Column (I)		Column (II)	
Molecule		Property	
(a)		(p)	Meso Compound
(b)		(q)	Compound having even no. of chiral centres
(c)		(r)	Optically active compound
(d)		(s)	Compound having odd no. of chiral centres.

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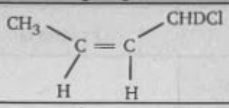
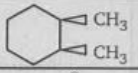
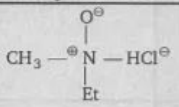
16. Match the Column (I), (II) and (III). (Matrix)

Column (I) Property		Column (II) Molecule		Column (III) No. of Chiral Center	
(a)		(p)	Optically active	(w)	0
(b)		(q)	Optically inactive	(x)	1
(c)		(r)	Plane of symmetry	(y)	2
(d)		(s)	Centre of symmetry	(z)	3

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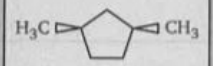
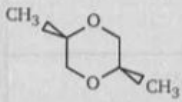
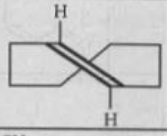
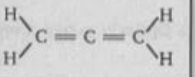
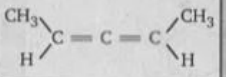
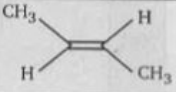
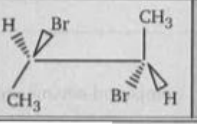
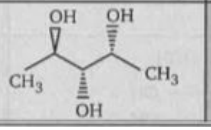
17.

(a)		(b)		(c)	
(d)		(e)		(f)	
(g)		(h)			

From the above compounds select :

(A) two of which are chiral and contain chiral centre : _____

(B) two of which are achiral and contains chiral centre : _____

(C) two of which are chiral and does not contain chiral centre : _____

(D) two of which are achiral and does not contain chiral centre : _____.

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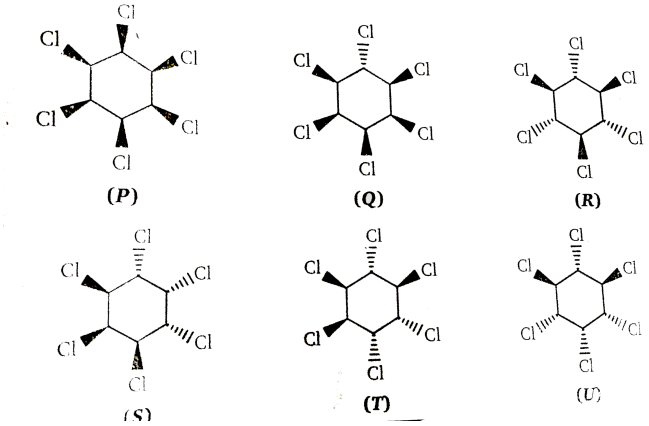
18.



Consider the structures and answer A, B & C

Which of the compound is optically active ?

A. P

B. R

C. S

D. T

Answer: A::D

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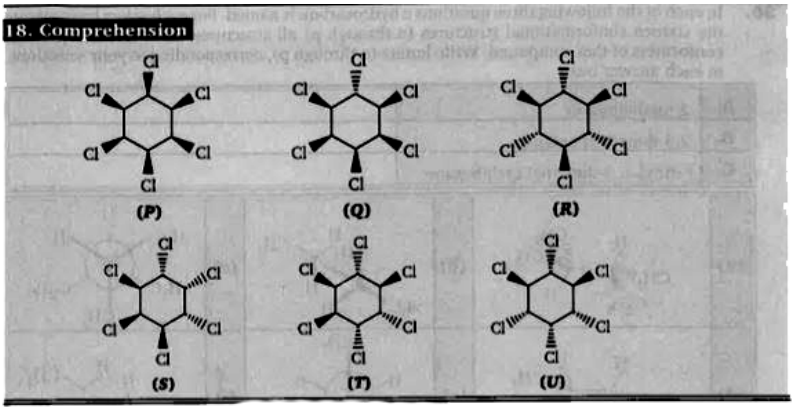
19.



Consider the given structures and answer A, B & C.

Which of the isomer is most stable ?

A. R

B. S

C. T

D. U

Answer: A::B

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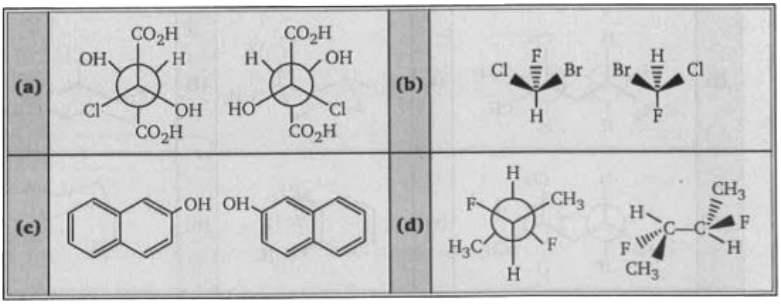
20. Identify relationship between following pairs :



If they are enantiomer answer will be 1, if they are diastereomers answer will be 2, if they are constitutional isomers answer will be 3 and if they are identical present 4 as the answer. Sum of answer of each part a + b + c + d is :.....

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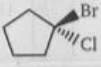
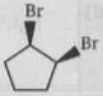
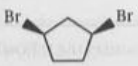
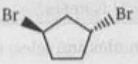
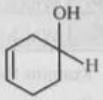
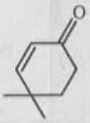
21. Examine structures a through j, shown below, with respect to their symmetry or lack of it. Assume that the five-membered rings and the ring in compound g are planar. The wedge-hatched bonds in b, c, d & e designate specific configurations. Also, for the acyclic compounds

assume stable anti conformations. Answer each of the following questions by writing letters (a through j), corresponding to your selections, in each answer box. If there is no structure that fits the description enter an x in the answer box.

Which structures are chiral ?

(a)		(b)		(c)	
(d)		(e)		(f)	
(g)		(h)	$C_2H_5CHCl_2$	(i)	$C_2H_5CHClC_2H_5$
(j)	$C_2H_5CHClCH_3$				

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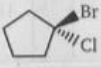
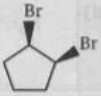
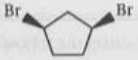
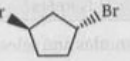
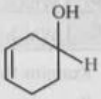
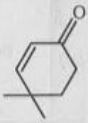
22. Examine structures through a to j, shown below, with respect to their symmetry or lack of it. Assume that the five-membered rings and the ring in compound g are planar. The wedge-hatched bonds in b, c, d & e

designate specific configurations. Also, for the acyclic compounds assume stable anti conformations. Answer each of the following questions by writing letters (a through j), corresponding to your selections, in each answer box. If there is no structure that fits the description enter an x in the answer box.

Which structures have a plane of symmetry?

(a)		(b)		(c)	
(d)		(e)		(f)	
(g)		(h)	$C_2H_5CHCl_2$	(i)	$C_2H_5CHClC_2H_5$
(j)	$C_2H_5CHClCH_3$				

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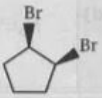
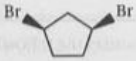
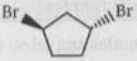
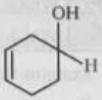
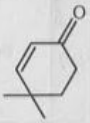
23. Examine structures through a to j, shown below, with respect to their symmetry or lack of it. Assume that the five-membered rings and the ring

in compound g are planar. The wedge-hatched bonds in b, c, d & e designate specific configurations. Also, for the acyclic compounds assume stable anti conformations. Answer each of the following questions by writing letters (a through j), corresponding to your selections, in each answer box. If there is no structure that fits the description enter an x in the answer box.

Which structures have a center of symmetry ?

(a)		(b)		(c)	
(d)		(e)		(f)	
(g)		(h)	$C_2H_5CHCl_2$	(i)	$C_2H_5CHClC_2H_5$
(j)	$C_2H_5CHClCH_3$				

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24. (i) 1,2-dichlorocyclopropane = w

(ii) 1,3-dimethyl-cyclobutane = x

(iii) 2-bromo-3-chlorobutane = y

(iv)1,3-dimethyl cyclohexane = x

Calculate total number of stereoisomer of the above compounds.

Sum of w+ x + y +z = ...

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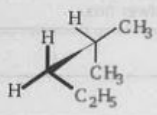
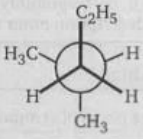
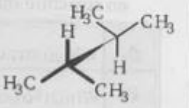
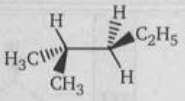
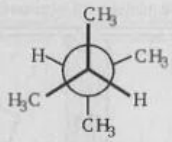
25. Examine the following formulas and select those pairs that satisfy the following conditions: Be sure to write two letters (and only two) in each answer box, unless you select f. In the second and third parts more than one answer is possible.

(a)		(b)		(c)	
(d)		(e)		(f)	No formulas meet the designated condition

Which are constitutional isomers?

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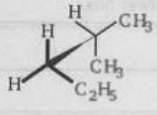
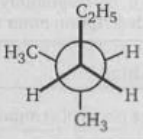
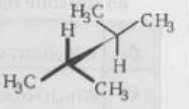
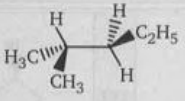
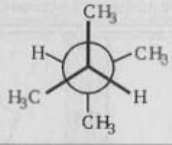
26. Examine the following formulas and select those pairs that satisfy the following conditions: Be sure to write two letters (and only two) in each answer box, unless you select f. In the second and third parts more than one answer is possible.

(a)		(b)		(c)	
(d)		(e)		(f)	No formulas meet the designated condition

Which are constitutional isomers?

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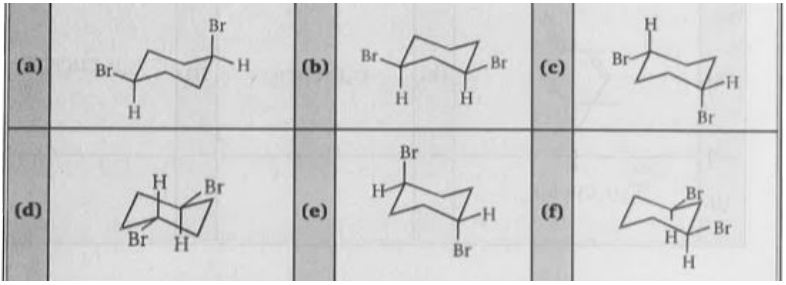
27. Examine the following formulas and select those pairs that satisfy the following conditions : Be sure to write two letters (and only two) in each answer box. In the second and fourth parts more than one answer is possible.



Which are identical in all respects?

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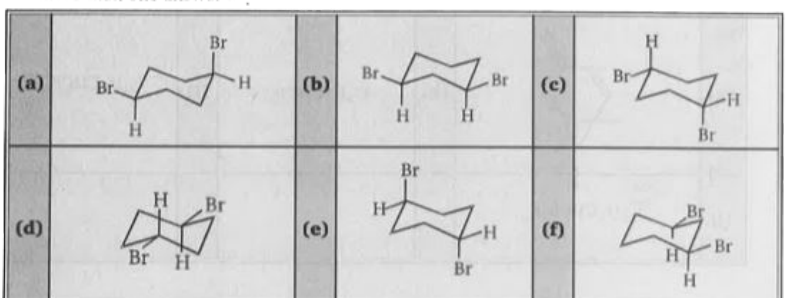
28. Examine the following formulas and select those pairs that satisfy the following conditions : Be sure to write two letters (and only two) in each answer box. In the second and fourth parts more than one answer is possible.



Which are configuration isomers?

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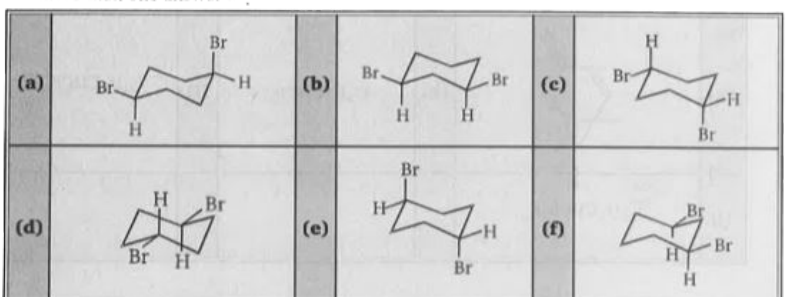
29. Examine the following formulas and select those pairs that satisfy the following conditions : Be sure to write two letters (and only two) in each answer box. In the second and fourth parts more than one answer is possible.



Which are configuration isomers?

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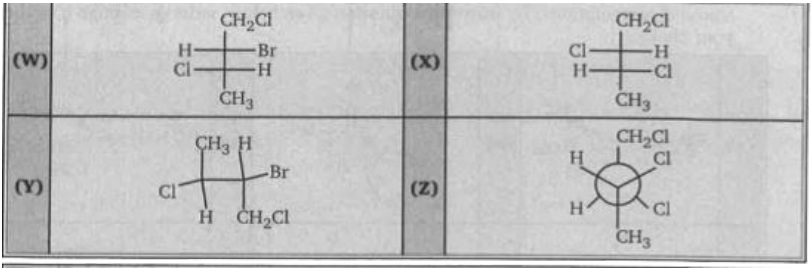
30. Consider the following statements regarding the given projection (True or False).



W and Y are diastereomers .

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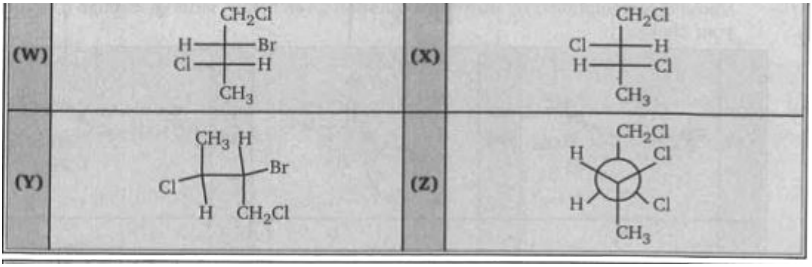
31. Consider the following statements regarding the given projection (True or False).



Z is the projection of X .

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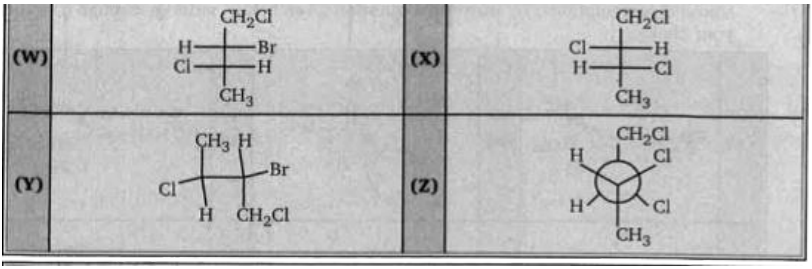
32. Consider the following statements regarding the given projection (True or False).



W, X, Y and Z are optically active .

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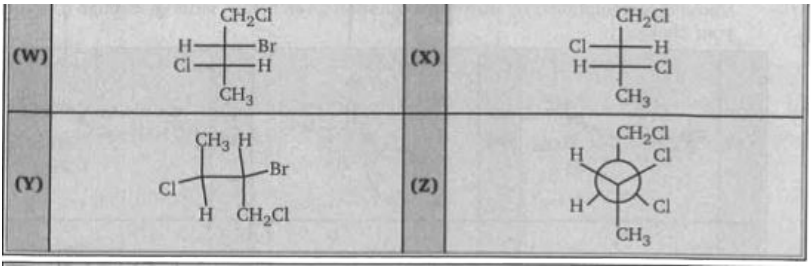
33. Consider the following statements regarding the given projection (True or False).



Y and Z are isomer .

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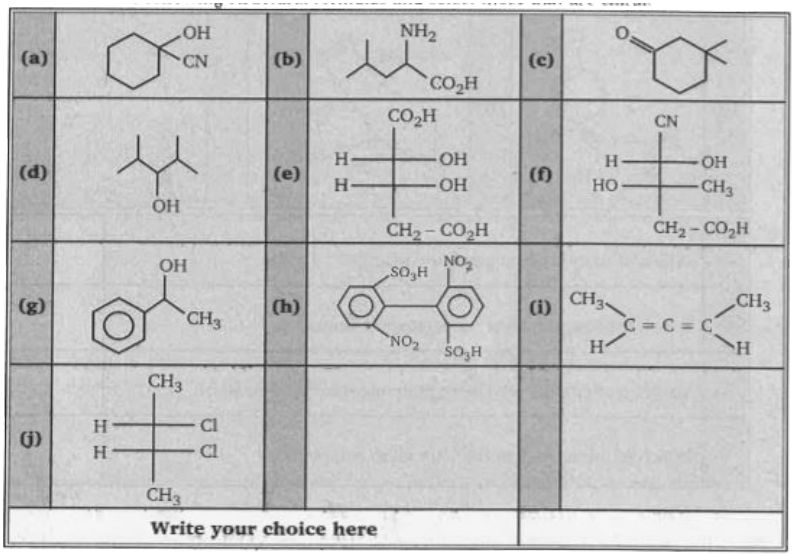
34. Examine the following structural formulas and select those that are chiral.



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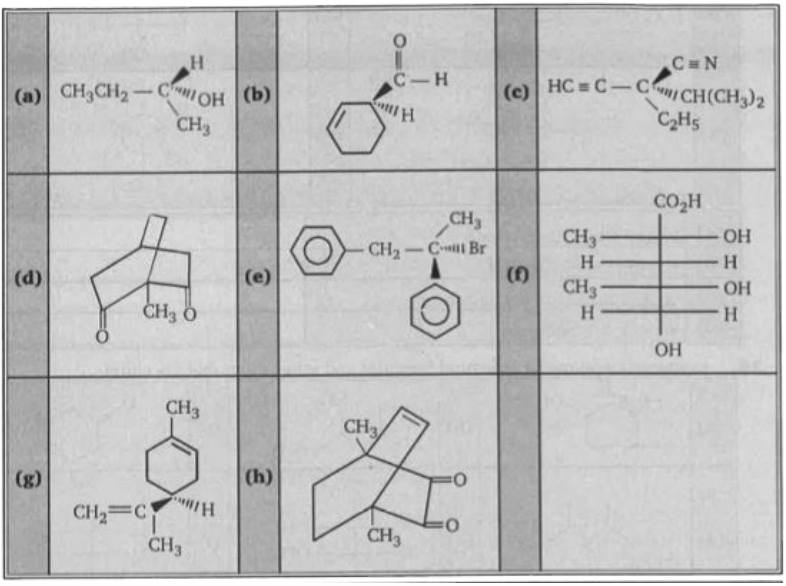
35. The configuration of eight compounds, a through h are shown below, using various kind of stereo representations. To answer the question given below, write (a through h) indicating your choice.



Which of these configuration are achiral?

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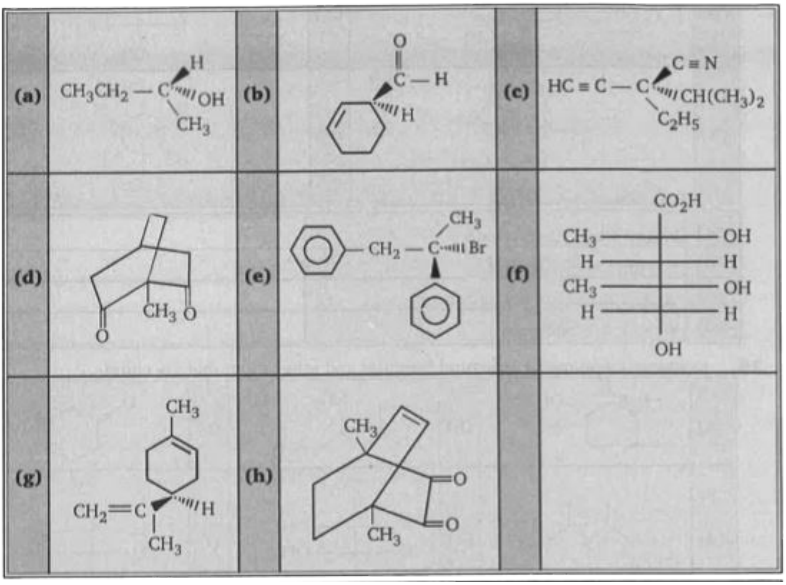
36. The configuration of eight compounds, a through h are shown below, using various kind of stereo representations. To answer the question given below, write (a through h) indicating your choice.



Which configuration has no stereogenic center?

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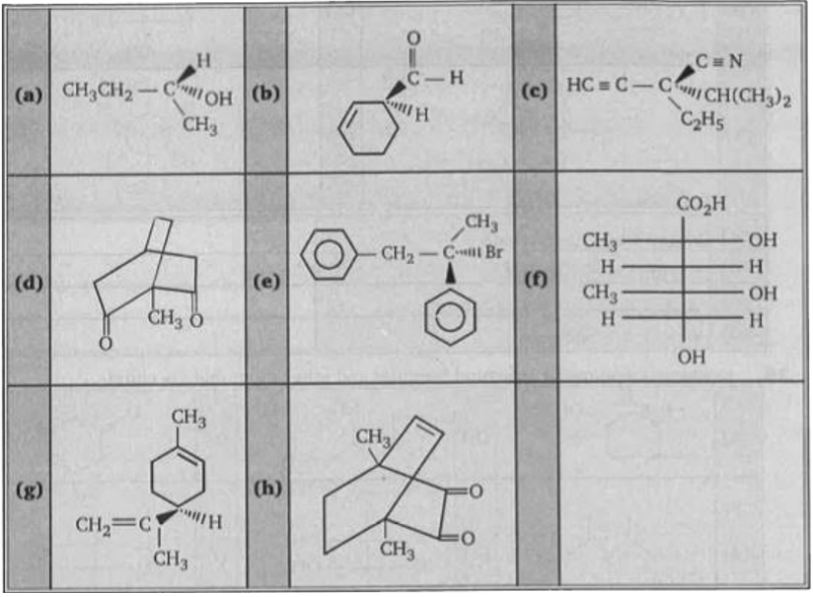
37. The configuration of eight compounds, a through h are shown below, using various kind of stereo representations. To answer the question given below, write (a through h) indicating your choice.



Which configuration has more than one stereogenic center?

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38. The configuration of eight compounds, a through h are shown below, using various kind of stereo representations. To answer the question given below, write (a through h) indicating your choice.

Which of these configuration are meso compound?

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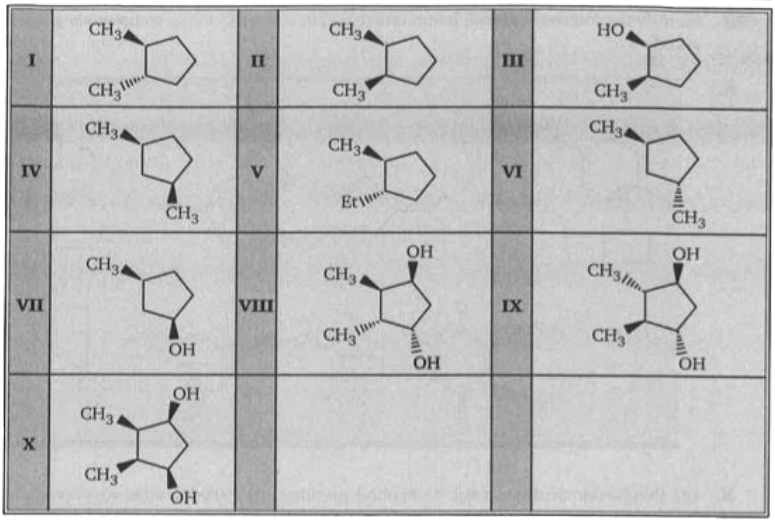
39. The structural formula of ten compounds, (I) through (X) are drawn below, you may select any one of these structure. Answer the following question about that compound.



A. How many chiral centre are present in this compound ?

(a) 0 (b) 1 (c) 2 (d) 3 (e) 4 (f) 5

B. Is this compound chiral or achiral ? C. What symmetry element are present in this compound ?

(a) None (b) Plane of symmetry (c) Center of symmetry

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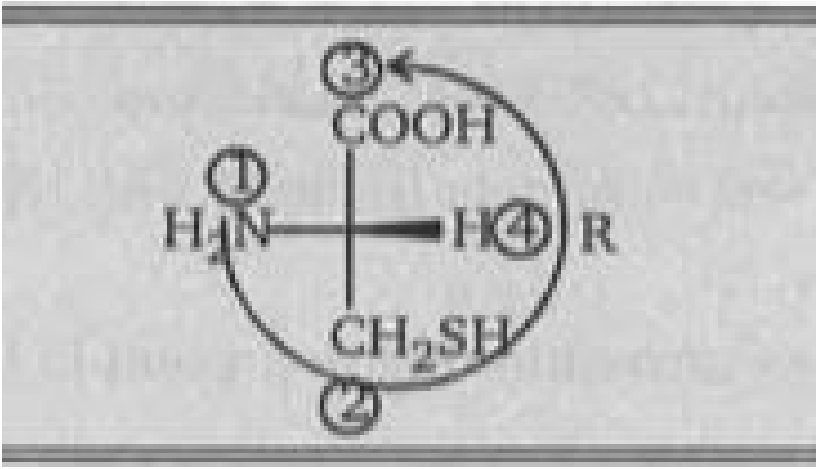
40. The structure of one of the enantiomers of the amino acid cysteine is shown below.



Classify this structure as : (a) R or S

(b) D or L

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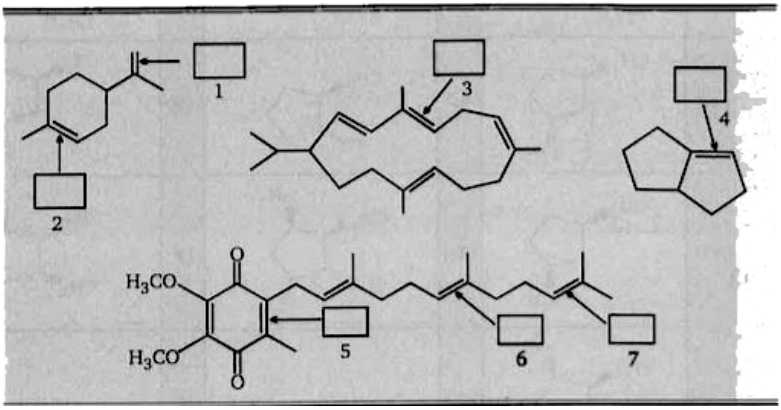
41. Identify the following double bonds either E, Z or None (N) in the compounds given below either.



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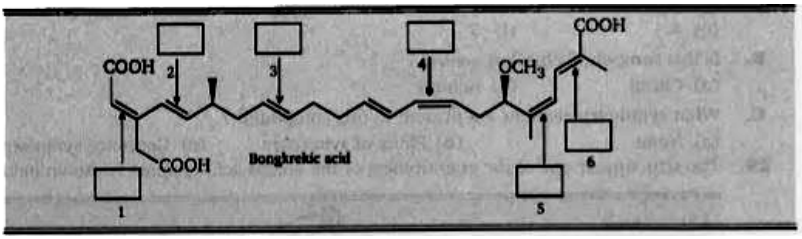
42. (a) Bongkrekic acid is a toxic compound produced by Pseudomonas cocovenenans, and isolated from a mold that rows on bongkrek, a fermented Indonesian coconut dish. (a) Label each double bond as E, Z or neither (N).



(b) How many total stereoisomers (including all types) are possible for bongkrekic acid ? _____.

(c) How many sites of unsaturation are present in bongkrekic acid ? ____.

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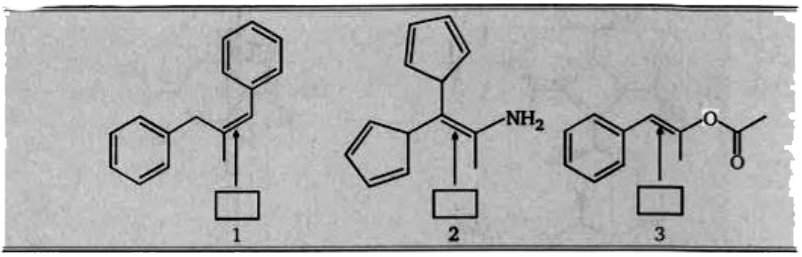
43. Designate the following double bonds as E, Z or none (N) configuration in the boxes provided below.



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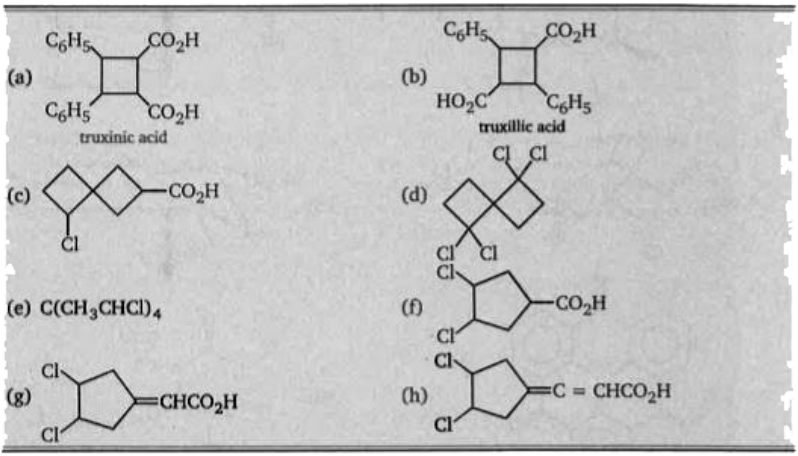
44. The following compounds may exist as two or more stereoisomers. These may be classified as enantiomer pairs or meso compounds.



Answer the following question about the above structure,

(A) Total number of stereoisomers :

(B) Number of enantiomeric pairs :

(C) Number of meso compounds :

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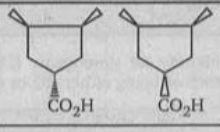
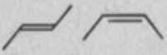
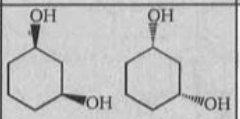
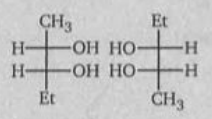
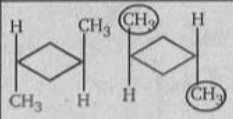
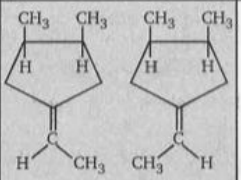
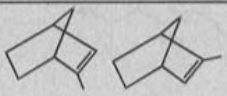
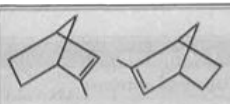
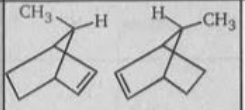
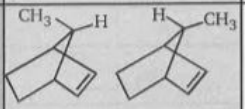
45. Find relationship between given pair :

		Identical	Enantiomer	Diastereomer	Constitutional Isomer
1.					
2.					
3.					
4.					
5.					
6.					
7.					

8.					
9.					
10.					

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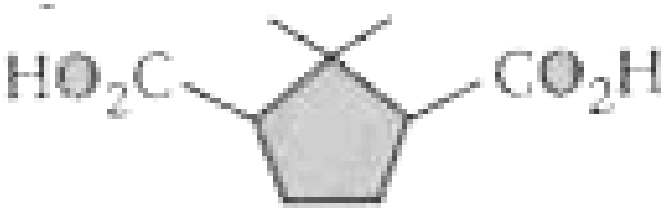
46. Structural formula of compound (A) is following:



The correct statement(s) about the compound (A) is/are:

A. The total number of stereoisomers possible for (A) is 3

B. The total number of mesoisomer possible for (A) is 1

C. The total number of pair of enantiomer possible for (A) is 1

D. All of these B.

Answer: d

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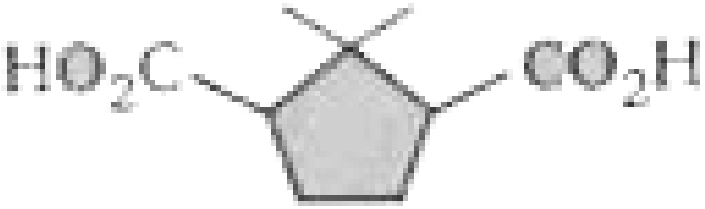
47. Structural formula of compound (A) is following:



Number of plane of symmetry in cis-form of compound (A) is:

A. 0

B. 1

C. 2

D. 3

Answer: b

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48. Match the column.

Column (I)		Column (II)	
No. of Carbon		No. of structural isomer	
(a)	C_4H_{10}	(p)	2
(b)	C_5H_{12}	(q)	3
(c)	C_6H_{14}	(r)	5
(d)	C_7H_{16}	(s)	9

A. s, r, q, p

B. p, q, r, s

C. q, p, r, s

D. p, q, s, r

Answer: a-p; b-q; c-r; d-s

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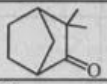
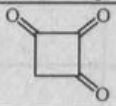
49. Match the column. (Matrix)

Column (I)	Compound	Column (II)	% of enol content
(a)		(p)	100 %
(b)		(q)	76 %
(c)	$CH_3-\overset{O}{\overset{\|\|}{C}}-CH_2-\overset{O}{\overset{\|\|}{C}}-CH_3$	(r)	8%
(d)	$CH_3-\overset{O}{\overset{\|\|}{C}}-CH_2-\overset{O}{\overset{\|\|}{C}}-O-Et$	(s)	Keto-Enol is not possible

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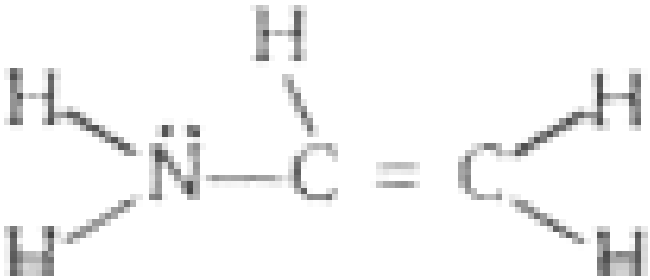
50. Draw a most stable conformation (N - C) bond in the following compound.



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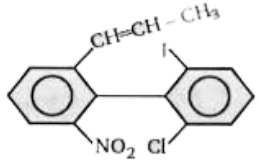
51. Find total number of stereoisomers for each compound given below :

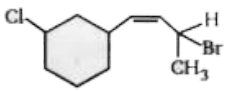
(1)

$$Ph - \overset{\overset{O}{||}}{S} - CH = CH - CH_2 - CH = C = C = CH - CH = CH - CH_3$$

(2)

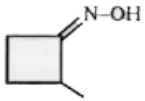


(3)



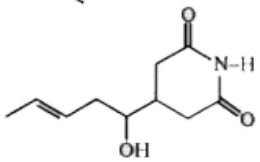
(4) $Ph - \underset{OH}{CH} - \underset{CH_3}{CH} - NH - CH_3$

(5)

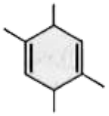


(6) $H - O - \overset{O}{\overset{||}{C}} - \underset{OH}{CH} - \underset{OH}{CH} - \overset{O}{\overset{||}{C}} - H$

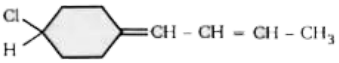
(7)



(8)

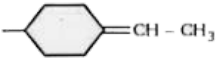


(9)



(10) $CH_3 - CH = CH - \underset{Br}{CH} - CH_3$

(11)



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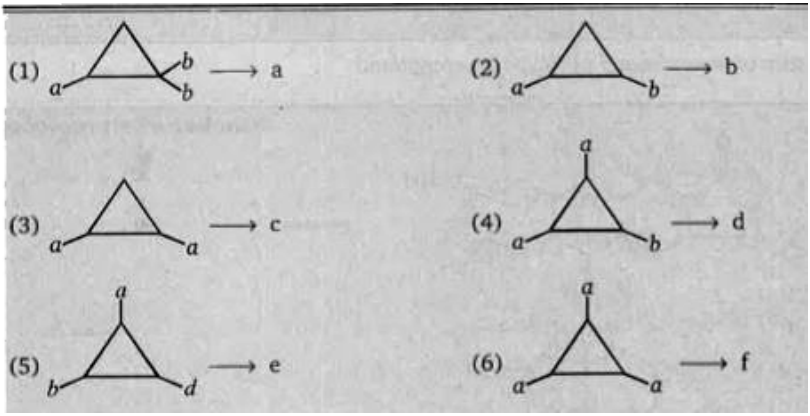
52. Find the total number of stereoisomer for each compound :



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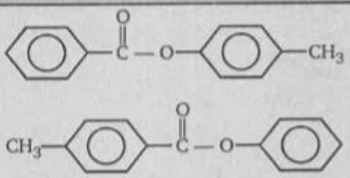
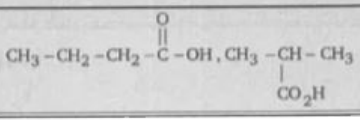
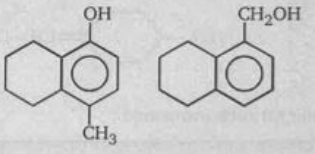
53. Match the column :

Column (I) Pair		Column (II) Isomeric Relationship	
(a)		(p)	Chain
(b)		(q)	Positional

(c)		(r)	Functional
(d)		(s)	Metamers

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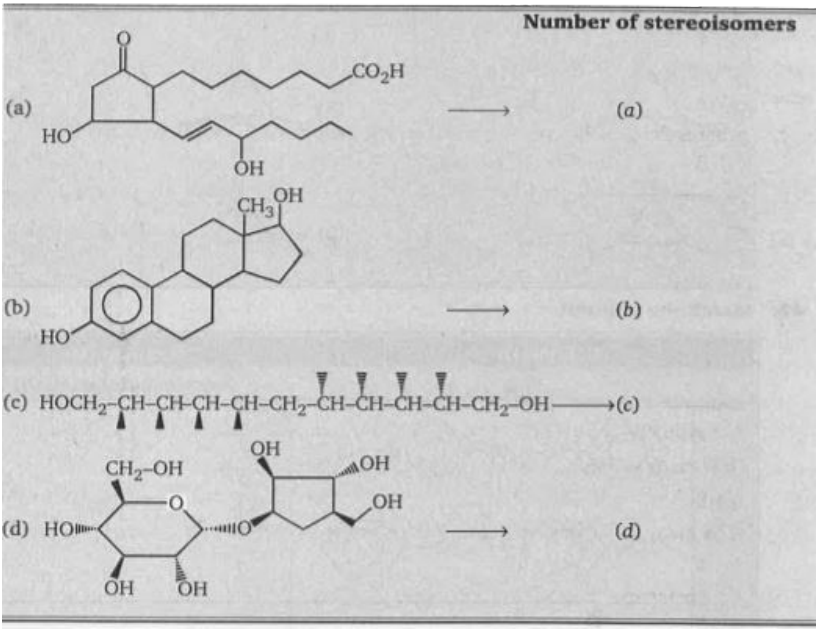
54. Find sum of stereoisomer of following compound.



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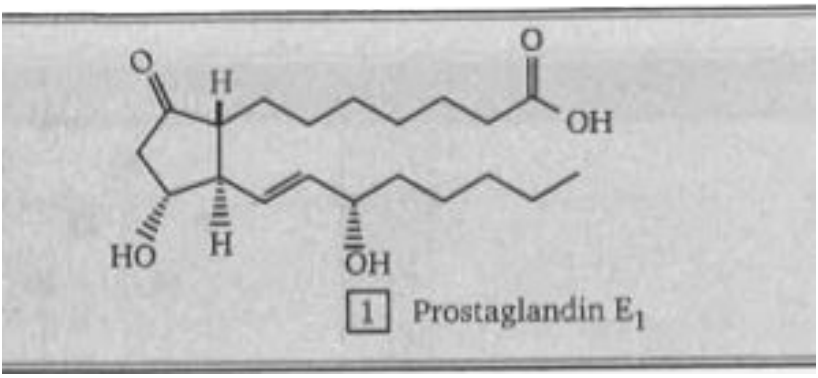
55. 

1 Prostaglandin E_1

Prostaglandin E1 1 is a compound produced by the body to regulate a variety of processes including blood clotting, fever, pain and inflammation.

Which of the following functional groups is not contained in 1 ?

A. A ketone

B. An alcohol

C. A carboxylic acid

D. A nitrile

Answer: d

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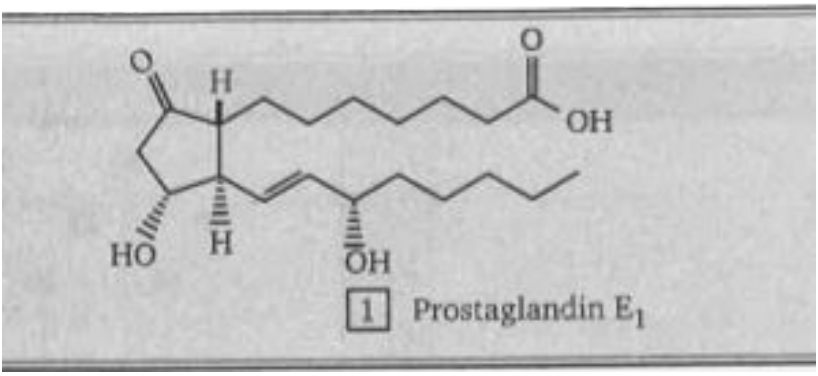
56. 

1 Prostaglandin E_1

Prostaglandin E1 1 is a compound produced by the body to regulate a variety of processes including blood clotting, fever, pain and inflammation.

How many asymmetric (stereogenic) centres are present in compound 1?

A. 3

B. 4

C. 5

D. 6

Answer: B

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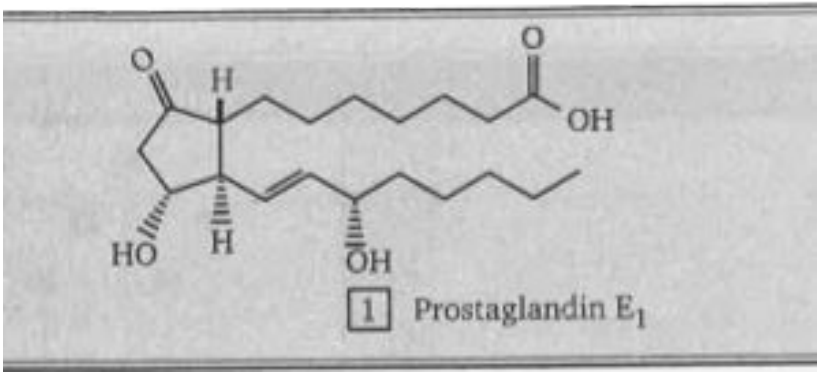
57. 

1 Prostaglandin E_1

Prostaglandin E1 1 is a compound produced by the body to regulate a variety of processes including blood clotting, fever, pain and inflammation.

How many sp^2 hybridised carbon atoms are present in compound 1 ?

A. 1

B. 2

C. 3

D. 4

Answer: D

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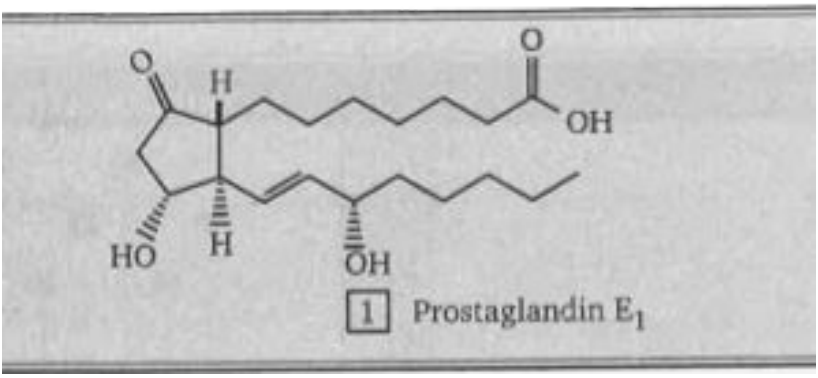
58. 

Prostaglandin E1 1 is a compound produced by the body to regulate a variety of processes including blood clotting, fever, pain and inflammation.

What is the geometric configuration about the double bond in compound 1?

A. E

B. Z

C. both a and b

D. none of these

Answer: A

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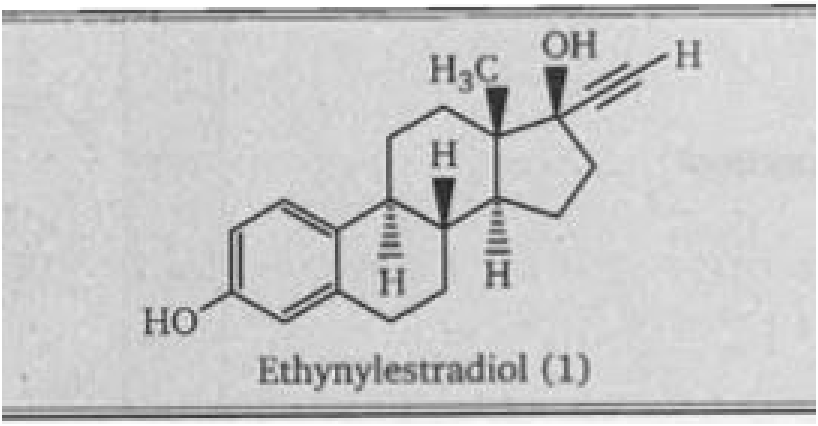
59. 

The synthetic steroid ethynylestradiol (1) is a compound used in the birth control pill.

How many sp^3 hybridised carbon atoms are present in compound (1)?

A. 8

B. 9

C. 10

D. 12

Answer: D

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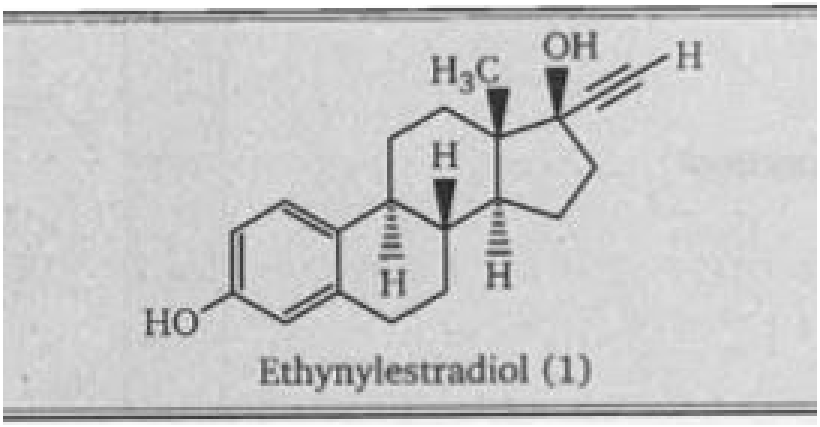
60.



Ethynylestradiol (1)

The synthetic steroid ethynylestradiol (1) is a compound used in the birth control pill.

How many sp^2 hybridised carbon atoms are present in compound (1) ?

A. 4

B. 5

C. 6

D. 7

Answer: C

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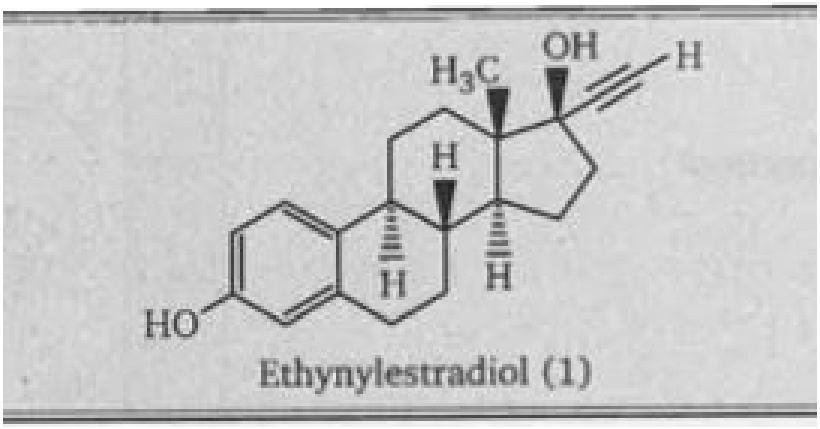
61. 

Ethynylestradiol (1)

The synthetic steroid ethynylestradiol (1) is a compound used in the birth control pill.

How many sp hybridised carbon atoms are present in compound (1) ?

A. 2

B. 4

C. 6

D. 8

Answer: A

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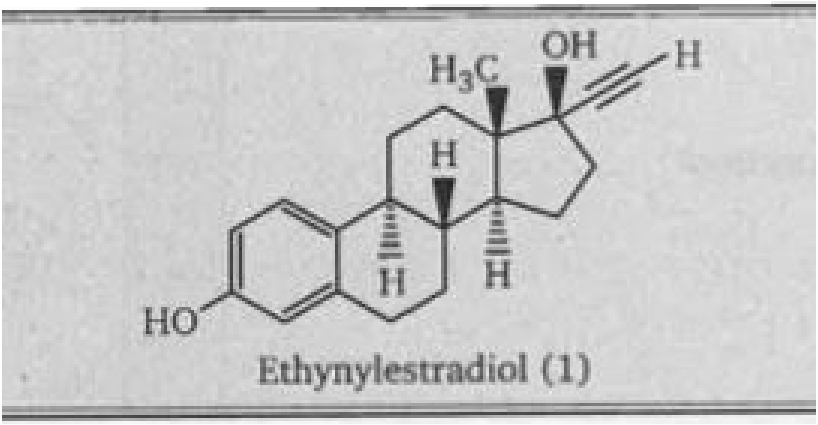
62. 

Ethynylestradiol (1)

The synthetic steroid ethynylestradiol (1) is a compound used in the birth control pill.

Which of the following functional group is contained in compound (1) ?

A. A ketone

B. An alcohol

C. A carboxylic acid

D. An ester

Answer: B

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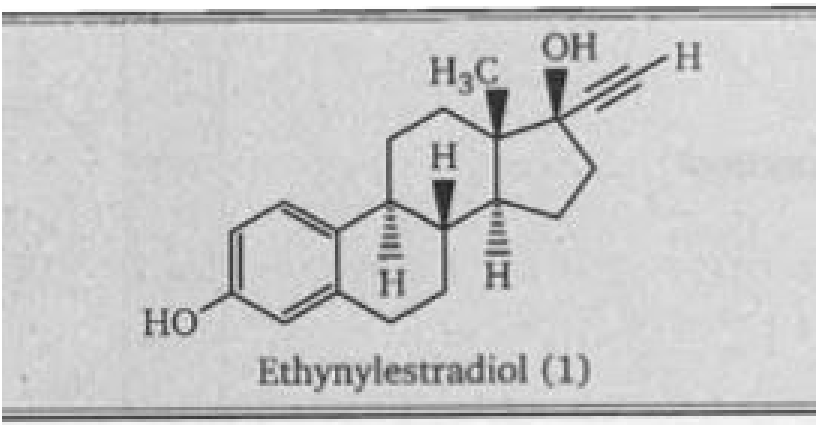
63.



Ethynylestradiol (1)

The synthetic steroid ethynylestradiol (1) is a compound used in the birth control pill.

How many asymmetric (stereogenic) centres are present in compound (1) ?

A. 2

B. 3

C. 4

D. 5

Answer: D

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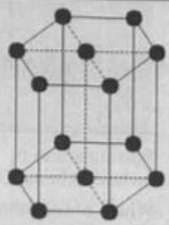
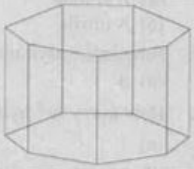
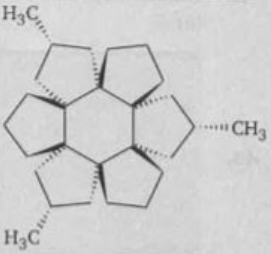
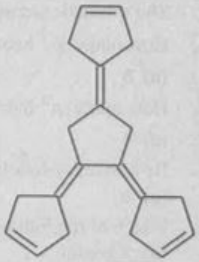
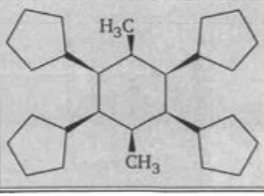
64. Match the column.

	Column (I)		Column (II)
(a)	C_2-axis of symmetry	(p)	
(b)	C_3-axis of symmetry	(q)	
(c)	Plane of symmetry	(r)	
(d)	Centre of symmetry	(s)	
		(t)	

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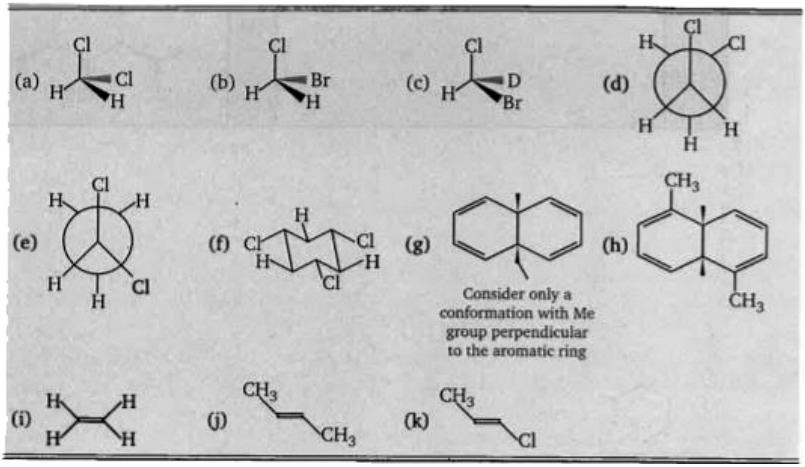
Level 2 Subjective Problems

1. Number of chiral isomers are:



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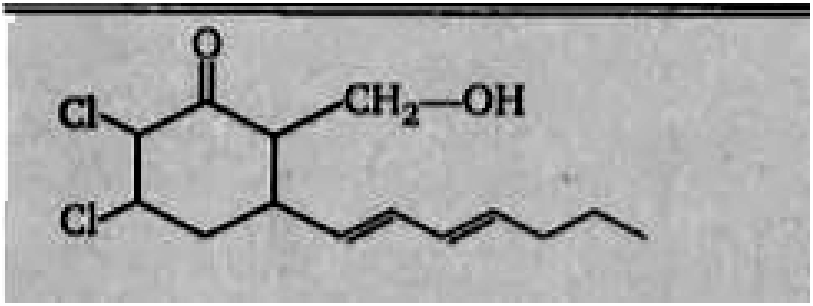
2.



Number of stereoisomer are

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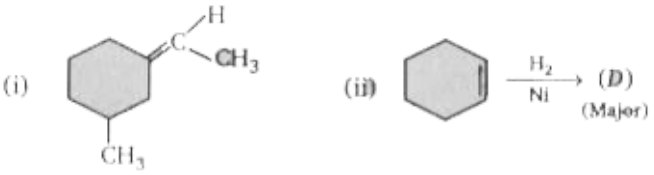

3.

Sum of number of stereoisomer (C) Degree of unsaturations in (D).

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4. How many 5 membered parent chain alkane are possible for C_7H_{16}?

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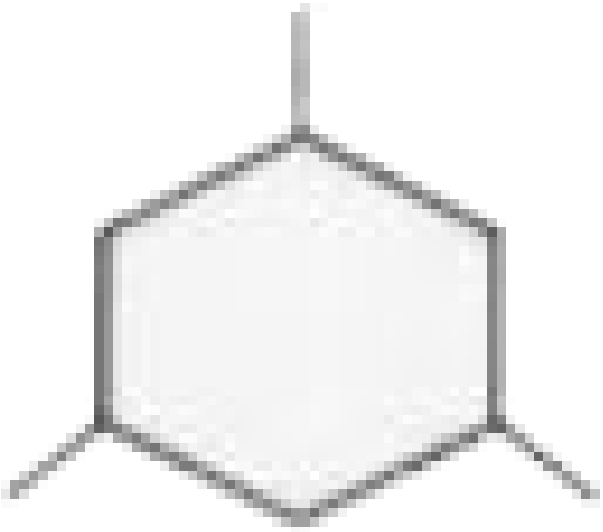
5. Theoretical possible geometrical isomer of



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6. Total number of possible structural isomers of $C_5H_{11}Br$.

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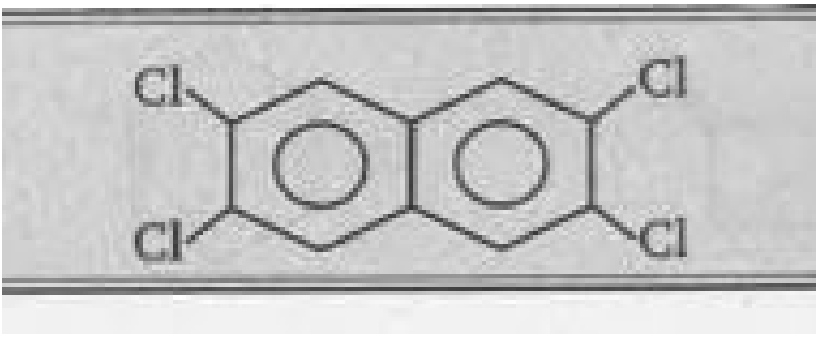
7. Total number of plane of symmetry present in given compound is



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8. Total number of isomers for $C_4H_6Br_2$ containing cyclobutane ring are (including stereoisomer) ?

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9. Total number of structural isomers of C_9H_{18} containing cyclohexane ring.

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10. How many structural isomer are possible for $C_4H_{10}O$ (only alcohol).

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11. The number of structural isomers for C_6H_{14} is :

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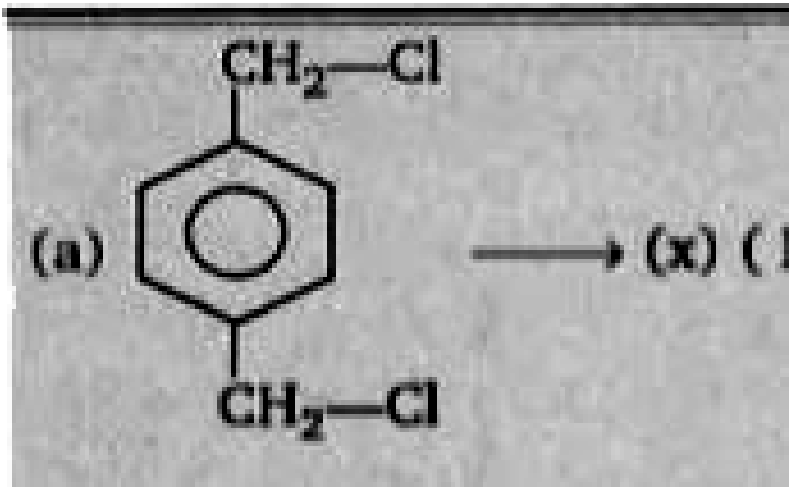
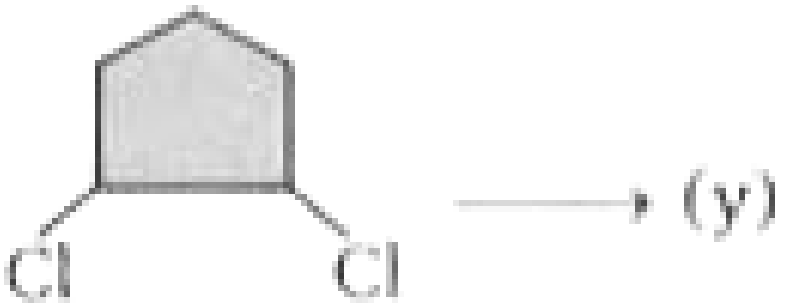
12. (a) 

$\rightarrow (x)$

(Number of plane of symmetry)



(b) $\rightarrow (y)$

(Number of mesoisomer of 1, 2-dichlorocyclopentane) Sum of $(x + y = ?)$

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13. Find out the total number of stereocentre in the given compound.

$$CH_3 - CH = CH - \underset{\underset{Br}{|}}{CH} - \underset{\underset{Cl}{|}}{CH} - CH_3$$

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14. How many different stereoisomers are possible for the following compound ?

$$ClHC = HC - \overset{\overset{H}{|}}{\underset{\underset{Cl}{|}}{C}} - CH = CHCl$$

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15. Find the total number of isomers of C_7H_{14} (only 5-membered ring).

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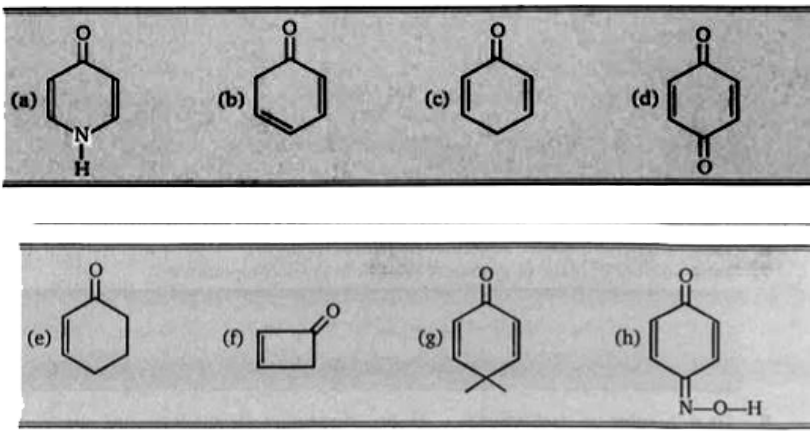
16. x = number of compounds which undergoes Tautomerisation to form an Aromatic product.



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17. If molecule is pyramidal, X stereoisomers are possible for :

C_{abcd}

find the value of X.

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