CHEMISTRY

BOOKS - BRILLIANT PUBLICATION

STEREOCHEMISTRY

Level I Homework

1. Isomers which can be interconverted by rotation of the moleucle around single bond

are (1) Geometrical isomers (2) Enantiomers (3) Conformers (4) Diastereomers

A. Geometrical isomers

B. Enantiomers

C. Conformers

D. Diastereomers

Answer:

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2. Which of the following conformations of n-butane is the most stable

A. Eclipsed

B. Fully ecclipsed

C. Gauche

D. Anti-staggered

Answer:

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3. Two compounds have the same composition and also have the same atoms attached to the same atoms, although with different orientations in space. These compounds are

A. Identical

B. Stereoisomers

C. Structural isomers

D. Position isomers

Answer:

4. Alkenes show geometrical isomerism due to (1) Asymmetry (2) Rotation around a single bond (3) Resonance (4) Restricted rotation around a double bond

A. Asymmetry

B. Rotation around a single bond

C. Resonance

D. Restricted rotation around a double bond

Answer:

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5. Which of the following compounds exhibit geometrical isomerism?

A. 1-pentene

B. 2-methyl-2-pentene

C. 2-pentene

D. 2-methyl-2-butene

Answer:

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6. Which of the following compounds will not show geometrical isomerism?

A. $BrCH = CHBr$

B. $BrCH = CHCl$

C. $CH_3 - \overset{Br}{\overset{|}{C}} = CHBr$

D. $CH_3 - \overset{CH_3}{\overset{|}{C}} = CHCH_3$

Answer:

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7. A molecule is said to be chiral

A. If it contains plane of symmetry

B. If it contains centre of symmetry

C. If it cannot be superimposed on its mirror image

D. If it can be superimposed on its mirror image

Answer:

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8. Optical isomers, which are non-super imposable images of each other are called

A. Tautomers

B. Diastereomers

C. Metamers

D. Enantiomers

Answer:

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9. Which of the following compounds are optically active?

A. I & II

B. II & III

C. III & IV

D. I and II

Answer:

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10. 2-Butanol is optically active because it contains

A. an asymmetric carbon

B. a plane of symmetry

C. a hydroxyl group

D. a centre of symmetry

Answer:

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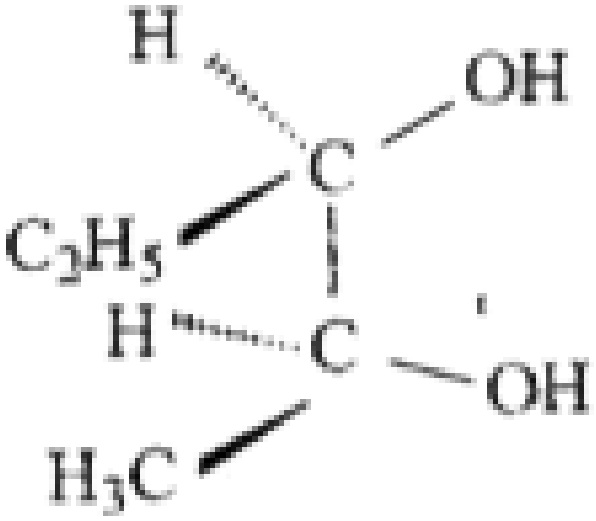
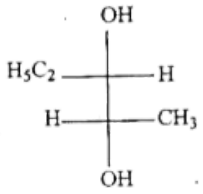
11. Fisher projection formula of

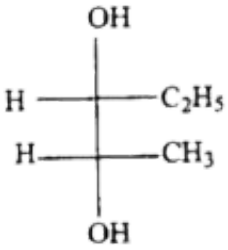


can be represented as

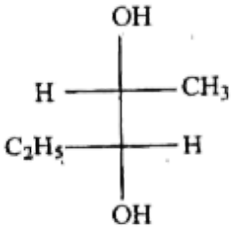
A.



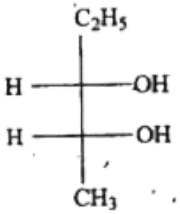
B.



C.



D.



Answer:

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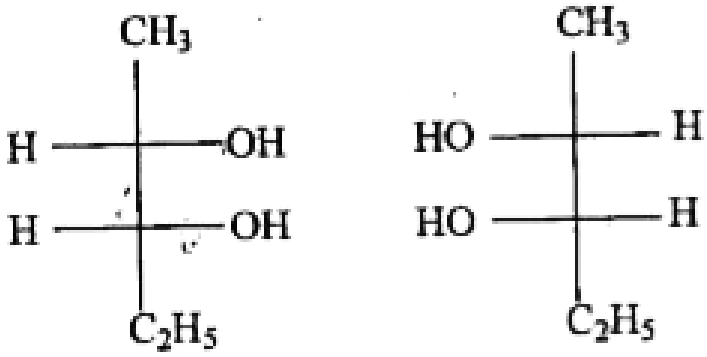
12. The following two compounds are



A. Meso isomers

B. Epimers

C. Enantiomers

D. Identical

Answer:

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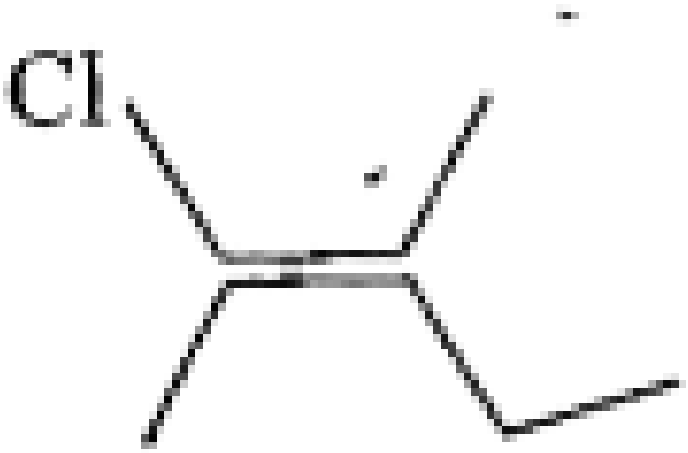
13. The IUPAC name of the compound is



A. Z-2-chloro,3-methyl pent-2-ene

B. E-2-chloro-3-methyl pent-2-ene

C. cis-2-chloro-3-methyl pent-2-ene

D. None

Answer:

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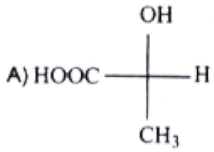
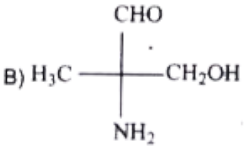
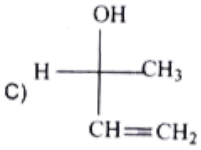
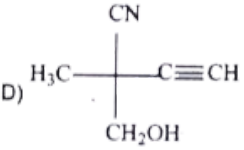
14. The following four compounds A,B,C and D have R or S configurations









A. RRRR

B. RRSS

C. RSRR

D. SRSR

Answer:

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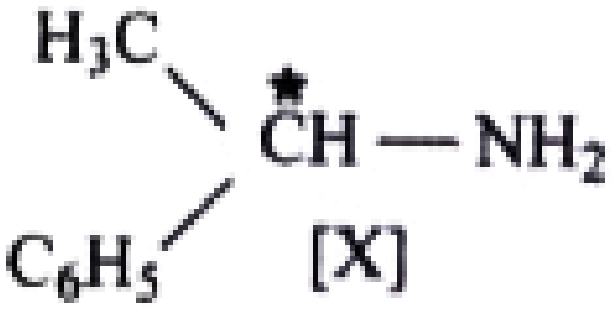
15. The optically active compound [X] on treatment with $NaNO_2 / HCl$ gives



[X]

A. 1° alcohol with retention of configuration

B. Racemic mixture of 2° alcohols

C. 2° alcohol with inversion of configuration

D. Racemic mixture of 1° alcohols

Answer:

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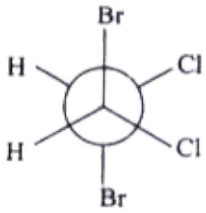
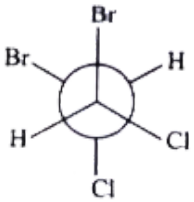
Level Ii

1. The most stable conformer of meso-1,2-dibromo-1, 2-dichloro ethane is

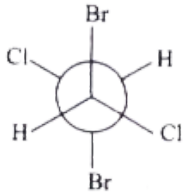


A.

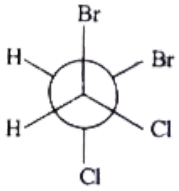


B.

C.



D.



Answer:

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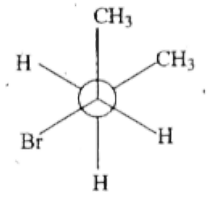
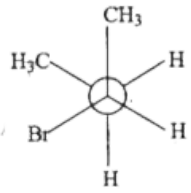
2. In the dehydrohalogenatino of 2-bromobutane, which conformation leads to the formation of cis-2 butene

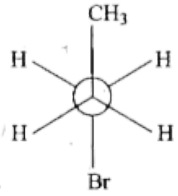
A.



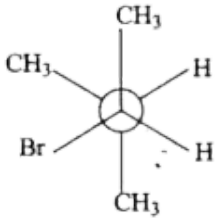
B.



C.



D.



Answer:

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3. How many geometrical isomers are possible for the following structure

A. 4

B. 6

C. 2

D. none

Answer:

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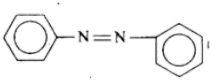
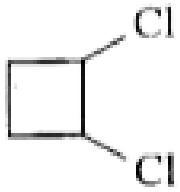
4. Which of the following exhibit geometrical isomerism

A. $CH_3 - CH = N - OH$

B. 

C. 

D. All the above

Answer:

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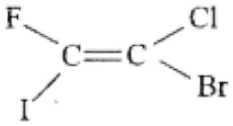
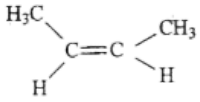
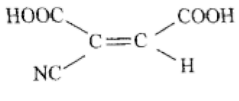
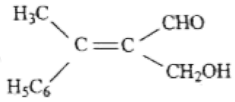
5. Which of the following is E-configuration

A. 

B. 

C. 

D. 

Answer:

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6. The IUPAC name of the compound

A. [2E, 4E, 6Z] - octa-2,4,6-triene

B. [2E, 45, 6E] - octa-2,4,6-triene

C. [2Z, 4E, 6Z] - octa-2,4,6-triene

D. [2Z, 4Z, 6Z] - octa-2,4,6-triene

Answer:

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7. Minimum number of carbonatoms for a substituted alkene to show geometrical isomerism is

A. 2

B. 3

C. 4

D. 5

Answer:

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8. The transformation of (+) or (-) form to racemic mixture ($\pm$) is called

A. Resolution

B. Asymmetric synthesis

C. Racemisation

D. Inversion

Answer:

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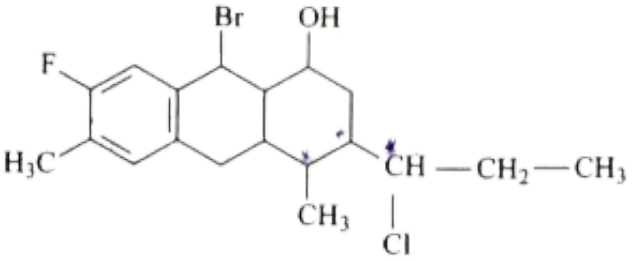
9. How many chiral centres are present in the following molecules



A. 3

B. 4

C. 6

D. 7

Answer:

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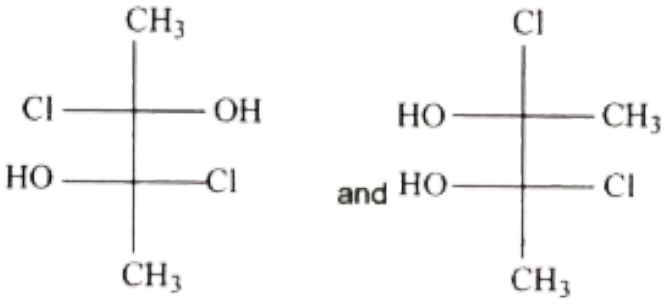
10. The following two compounds are



A. Diastereomers

B. Enantiomers

C. Meso forms

D. Identical

Answer:

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11. $(+)$ Mandelic acid has a specific rotation of $+158^{\circ}$. What would be the observed rotation of a mixture of 30% (-) mandelic acid and 70% (+) mandelic acid

A. $+118.5$

B. -118.5

C. -63.2

D. $+63.2$

Answer:

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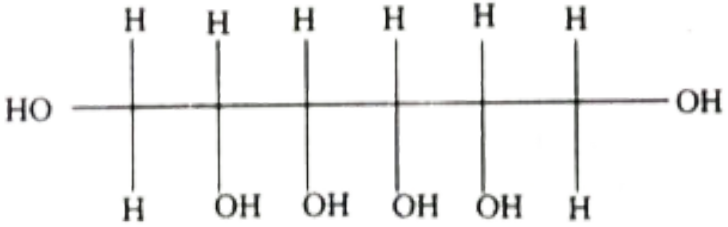
12. The optically active and meso forms possible for the following structure will be



A. 16,8

B. 8,2

C. 8,4

D. 32,8

Answer:

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13. Methyl ethyl amine cannot be resolved into enantiomers because :

A. it is planar

B. it undergoes rapid inversion

C. it has a plane of symmetry

D. a trivalent atom cannot be a centre of chirality

Answer:

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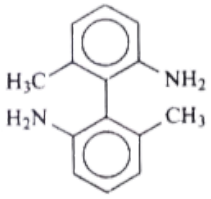
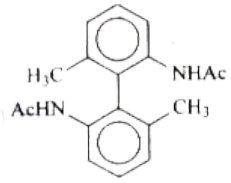
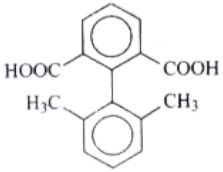
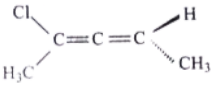
14. Select the optically inactive compound among the following

A. 

B. 

C. 

D. 

Answer:

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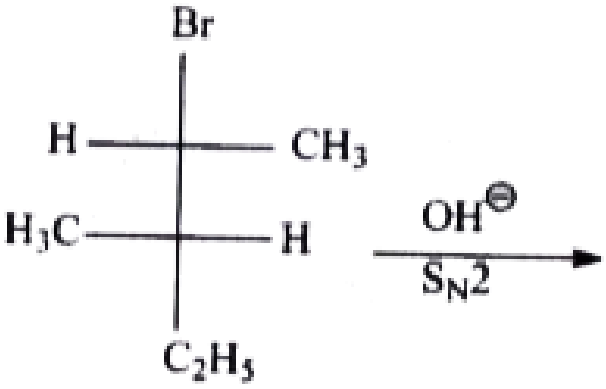
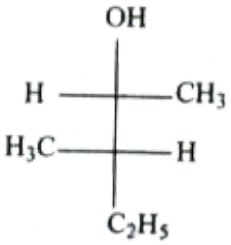
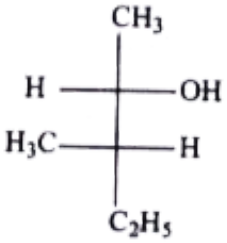
15. In the following reaction the most probable product will be


Br
H
CH3
H3C
H
C2H5
OH⊖
SN2

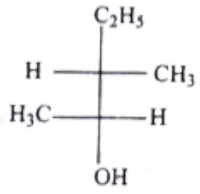
A.

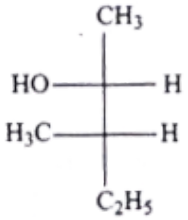

OH
H
CH3
H3C
H
C2H5

B.


CH3
H
OH
H3C
H
C2H5

C.


C2H5
H
CH3
H3C
H
OH

D. 

Answer: D

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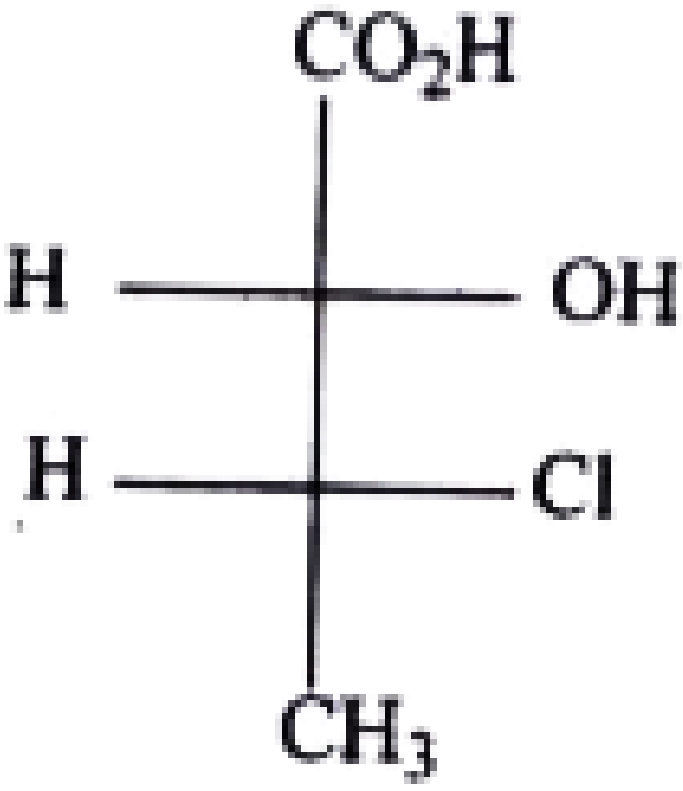
16. Assign R or S configuration to the Fischer projection of the following compound



A. 2R, 3R

B. 2R, 3S

C. 2S, 3R

D. 2S, 3S

Answer:

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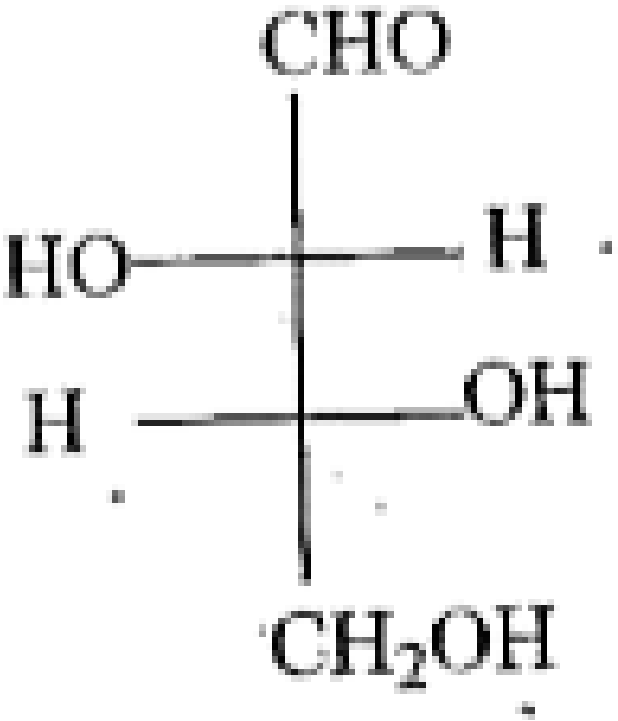
17. What are the configurations of carbon atoms 2 and 3 respectively in D-Threose shown

below



A. R, R

B. S, S

C. S,R

D. R, S

Answer:

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18. During debromination of meso-2, 3-dibromo butane the major compound formed is

A. n-butane

B. but-1-ene

C. cis but-2-ene

D. trans.but-2-ene

Answer:

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19. On monochlorination of 2-methyl butane, the total number of chiral compounds formed is

A. 2

B. 4

C. 6

D. 8

Answer:

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Level Ii Assertion Reason Type

1. Assertion : Meso tartaric acid is optically inactive

Reason : Meso tartaric acid has a plane of symmetry

A. If both Assertion and Reason are true and Reason is correct explanation of Assertion

B. If both Assertion and Reason are true but Reason is not correct explanation of Assertion

C. If Assertion is true and Reason is wrong

D. If Assertion is wrong and Reason is true

Answer:

2. Assertion : All compounds having C=C bond exhibit geometrical isomerism .

Reason : Rotation about C=C bond is restricted

A. If both Assertion and Reason are true and Reason is correct explanation of Assertion

B. If both Assertion and Reason are true but Reason is not correct explanation of Assertion

C. If Assertion is true and Reason is wrong

D. If Assertion is wrong and Reason is true

Answer:

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Questions Level I

1. Which of the following kinds of isomerism can nitroethane exhibit?

A. Metamerism

B. Optical activity

C. Tautomerism

D. Position isomerism

Answer: C

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2. How many gem dihalides with different formulas are possible for $C_3H_6Cl_2$?

A. 1

B. 2

C. 3

D. 4

Answer: B

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3. Predict the number of stereoisomers for 2, 5-heptadiene.

A. 4

B. 3

C. 2

D. 5

Answer: B

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4. The least energetic conformation of cyclohexane is:

A. Boat form

B. Half chair form

C. Chair form

D. Twisted form

Answer: C

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5. Mesotartaric acid is optically inactive due to the presence of:

A. Geometrical isomerism

B. Two chiral carbon atoms

C. Molecular symmetry

D. External compensation

Answer: C

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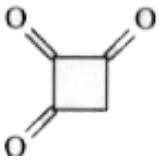
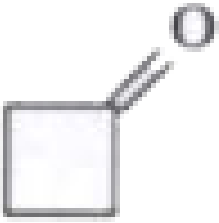
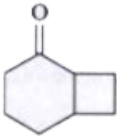
6. Tautomerism is not exhibited by:

A. 

B. 

C. 

D. 

Answer: B

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7. An SN^2 reaction at an asymmetric C of a compound always gives:

A. An enantiomer of the substrate

B. A product with opposite optical rotation

C. A mixture of diastereomers

D. A single stereoisomer

Answer: D

Watch Video Solution

8. Isomers which can be interconverted by rotation of the moleucle around single bond are (1) Geometrical isomers (2) Enantiomers (3) Conformers (4) Diastereomers

A. Conformers

B. Diastereomers

C. Enantiomers

D. geometrical isomers

Answer: A

 Watch Video Solution

9. The absolute configuration of the following structure is

A. S,S

B. R,R

C. R,S

D. S,R

Answer: B

Watch Video Solution

10. alpha-D(+) glucose and beta-D(+) glucose are

A. conformers

B. epimers

C. anomers

D. enantiomers

Answer: C

Watch Video Solution

11. Which of the following will not show mutarotation?

A. Maltose

B. Lactose

C. Glucose

D. Sucrose

Answer: D

Watch Video Solution

12. The geometric isomers

A. rotate the plane of polarised light

B. exhibit optical properties

C. contain at least one carbon-carbon double bond

D. contain at least one carbon-carbon triple bond

Answer: C

Watch Video Solution

13. Which of the following compounds exhibits cis-trans iosmerism?

A. 2-Butene

B. 2-Butyne

C. 2-Butanol

D. Butanal

Answer: A

Watch Video Solution

14. Which of the following is not chiral?

A. 2-Hydroxypropanoic acid

B. 2-Butanol

C. 2,3-Dibromobutane

D. 3-Bromopentane

Answer: D

Watch Video Solution

15. Out of the following, the alkene that exhibits optical isomerism is

A. 3-methyl-1-pentene

B. 2-methyl-2-pentene

C. 3-methyl-2-pentene

D. 4-methyl-1-pentene

Answer: A

Watch Video Solution

16. The organic chloro compound, which shows complete stereochemical inversion during a SN^2 reaction, is

A. $(C_2H_3)_2CHCl$

B. $(CH_3)_3\mathbb{C}l$

C. $(CH_3)_2CHCl$

D. CH_3Cl

Answer: D

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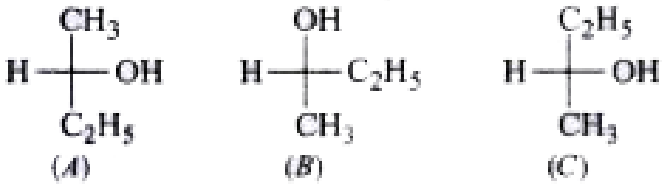
17. The correct statements about compounds A, B and C is/are:



A. 'A' and 'B' are enantiomers

B. 'B' and 'C' are enantiomers

C. 'A' and 'C' are enantiomers

D. 'A' and 'C' are diastereomers

Answer: C

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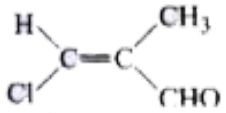
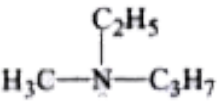
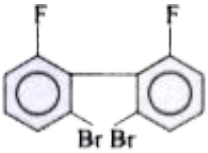
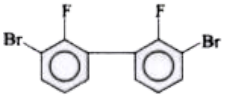
18. Which of the following species will be optically active:

A. 

B. 

C. 

D. 

Answer: C

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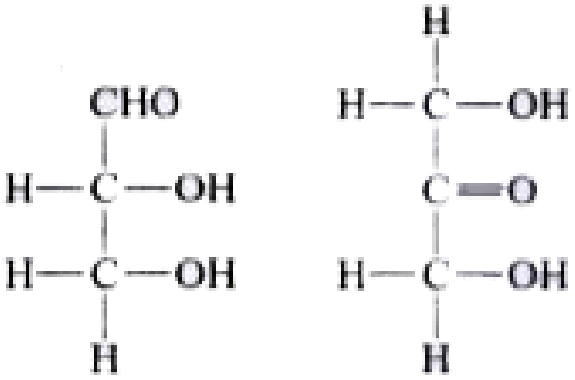
19. What is the relationship between two molecules?



A. Isotopes

B. Enantiomers

C. Structural isomers

D. Geometric isomers

Answer: C

Watch Video Solution

20. Which of the alkenes below can exist as stereoisomer?

A. 

B. 

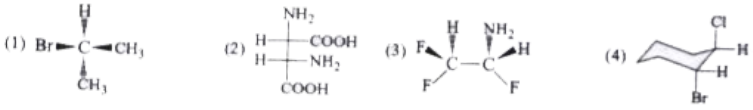
C. 

D. $(CH_3)_2C = C(CH_3)_2$

Answer: B

Watch Video Solution

21. Which of the following molecule/molecules have a plane of symmetry?



A. (1, 2)

B. only (1)

C. only (2)

D. all of these

Answer: A

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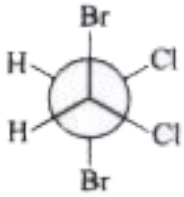
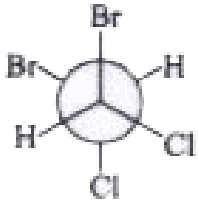
22. The most stable conformer of meso-1,2-dibromo-1, 2-dichloro ethane is

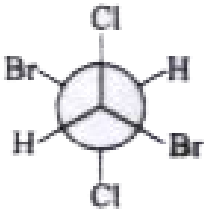
A.



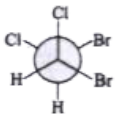
B.



C.



D.



Answer: C

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23. Methyl ethyl amine cannot be resolved into enantiomers because :

A. It is planar

B. It undergoes rapid inversion

C. It has a plane of symmetry

D. A tricovalent atom cannot be a centre of chirality .

Answer: B

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24. An enantiomerically pure acid is treated with racemic mixture of an alcohol having one chiral carbon. The ester formed will be

A. optically active mixture

B. pure enantiomer

C. meso compound

D. racemic mixture

Answer: A

Watch Video Solution

25. The number of stereoisomers obtained by bromination of trans- 2 - butene is

A. 1

B. 2

C. 3

D. 4

Answer: A

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26. The two enantiomers of a compound have

A. different direction of rotation but the same amount of rotation

B. same direction of rotation but different amount of rotation

C. same direction of rotation as well same amount of rotation

D. different direction of rotation as well as different amount of rotation

Answer: A

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27. Which of the following compounds shows optical isomerism?

A. $CH_3CHOHCOOH$

B. $CH_3CH(CH_3)COOH$

C. $CH_3CH(CH_3)CH_2OH$

D. $CH_3CH(CH_3)CH_2Cl$

Answer: A

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28. Mesotartaric acid and d-tartaric acid are

A. position isomers

B. enantiomers

C. diastereomers

D. racemic mixture

Answer: C

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29. For an optically active compound, which of the following requirements is necessary?

A. A double bond

B. Presence of one chiral atom

C. Presence of two chiral atoms

D. Presence of plane of symmetry

Answer: B

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30. The number of stereoisomers for a compound having four different chiral centres is

A. 2

B. 4

C. 8

D. 16

Answer: D

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Questions Level Ii

1. Which of the following statements is correct?

A. The presence of chiral carbon is essential condition for enantiomerism.

B. Functional isomerism is a kind of stereoisomerism.

C. The compounds containing one chiral carbon only are always chiral.

D. All statements are correct.

Answer: C

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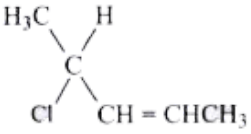
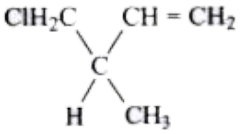
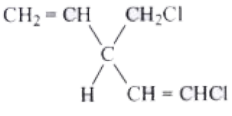
2. Which of the following will not show geometrical isomerism?

A. 

B. 

C. 

D. $CH_2CH = CHCH_2CH_3$

Answer: B

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3. The minimum number of carbon atoms, an alkane should contain in order to exhibit optical activity is :

A. 5

B. 6

C. 7

D. 8

Answer: C

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4. A compound whose molecule is superimposable on its mirror image despite containing chiral carbon atoms is called :

A. Threo isomer

B. Meso compound

C. Enantiomer

D. Erythro isomer

Answer: B

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5. Which of the following will have zero dipole moment?

A. cis-1,2-Dichloroethene

B. trans-1,2-Dichloroethene

C. Dichloromethane

D. o-Phenylene dichloride

Answer: B

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6. The number of structural isomers that can be obtained theoretically on monochlorination of 2-methylbutane is:

A. 1

B. 2

C. 3

D. 4

Answer: D

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7. The smallest aldehyde and its next homologue are treated with NH_2OH to form oxime. Find out the correct answer out of the following.

A. Two different oximes are formed

B. Three different oximes are formed

C. Two oximes are optically active

D. All oximes are optically active

Answer: B

8. The optically active tartaric acid is named as D-(+)-tartaric acid because it has a positive

A. Optical rotation and is derived from D-glucose.

B. pH in organic solvent.

C. Optical rotation and is derived form D-(+)-glyceraldehyde.

D. Optical rotation when substituted by deuterium.

Answer: C

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9. Which of the following compounds will exhibit geometrical isomerism?

A. 1-Phenyl-2-butene

B. 3-Phenyl-1-butene

C. 2-Phenyl-1-butene

D. 1,1-Diphenyl-1-propene

Answer: A

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10. The number of isomers for the compound with molecular formula $C_2BrClFI$

A. 3

B. 4

C. 5

D. 6

Answer: D

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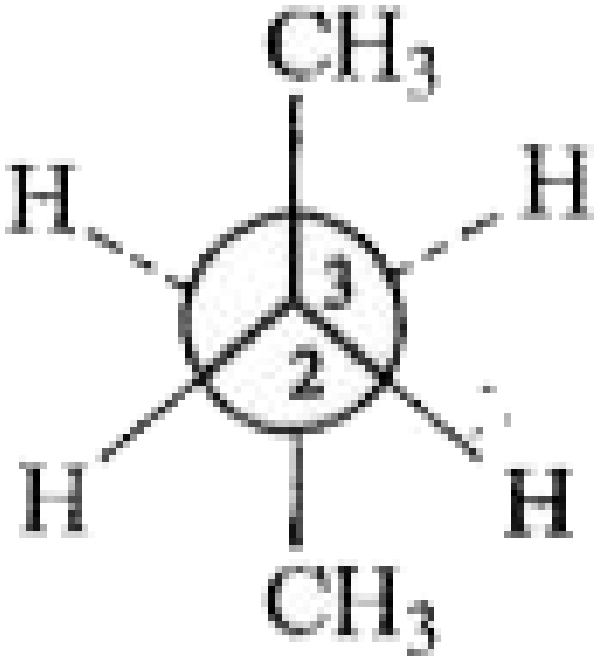

11.

In the above compound, C_2 is rotated

clockwise 120° about $C_2 - C_3$ bond. The resulting conformer is:

A. Partially eclipsed

B. Eclipsed

C. Gauche

D. Staggered

Answer: C

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12. The term anomers of glucose refers to

A. isomers of glucose that differ in configurations at carbons one and four (C-1 and C-4)

B. a mixture of(D)-glucose and (L)-glucose

C. enantiomers of glucose

D. isomers of glucose that differ in configuration at carbon one (C-1)

Answer: D

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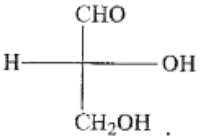
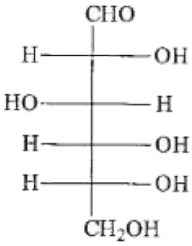
13. Optical rotations of some compounds along with their structures are given below. Which of them have D configuration?



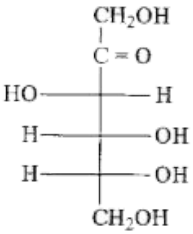
(+ rotation)

(I)



(+) rotation

(II)



(–) rotation

(III)

A. I, II, III

B. II, III

C. I,II

D. III

Answer: A

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14. During debromination of meso-2, 3-dibromo butane the major compound formed is

A. n-butane

B. I-butene

C. cis-2-butene

D. trans-2-butene

Answer: D

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15. Which of the following statements is correct?

A. The dehalogenation of meso-2,3-dibromobutane produces cis-2-butene

B. The dehalogenation of (S, S)-2,3-dibromobutane produces trans-2-butene

C. Dehydrobromination of (R, R)-2, 3-dibromobutane produces cis-2-bromobutene

D. Dehydrobromination of meso-2,3-dibromobutane produces cis-2-bromo-2-butene

Answer: D

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16. Which of the following statements is correct?

A. The cis addition of H_2 to cis-2, 3-dibromobutene produces meso-2,3-dibromobutane

B. The cis addition of H_2 to trans-2,3-dibromobutene produces meso-2,3-dibromobutane

C. The hydroxylation of cis-2,3-dimethylbutene with Baeyer's reagent produces racemic-2, 3-dihydroxybutane

D. The hydroxylation of trans-2,3-dimethylbutene with Baeyer's reagent produces meso-2,3-dihydroxybutane

Answer: A

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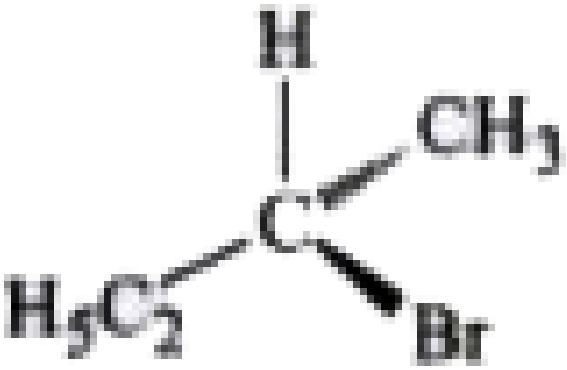
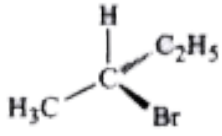
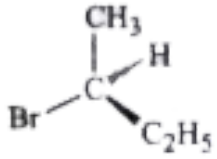
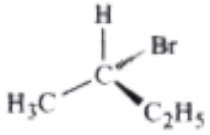
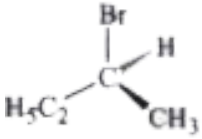
17. Which of the following structures is enantiomeric with the molecule (X)given below:



A. 

B. 

C. 

D. 

Answer: A

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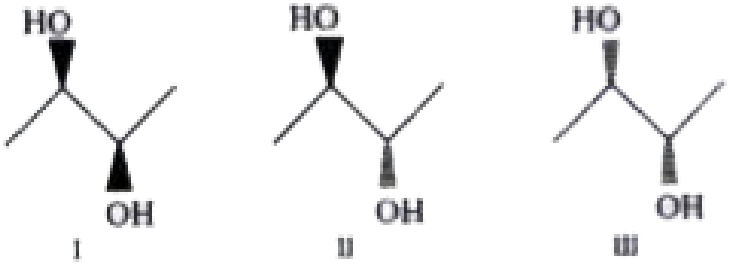
18. The correct statement for the following compounds is:



A. all the compounds are chiral

B. I and III are diastereomers

C. only I and II are chiral

D. only I and III are chiral

Answer: D

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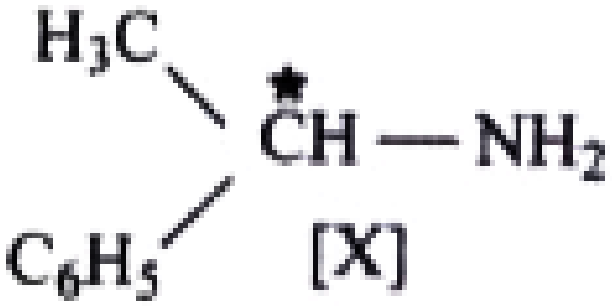
19. The optically active compound [X] on treatment with $NaNO_2 / HCl$ gives



[X]

A. 1° alcohol with retention of configuration

B. 2° alcohol with inversion of configuration

C. racemic mixture of 2° alcohols

D. racemic mixture of 1° alcohols

Answer: C

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20. How many enantiomeric pairs are possible on monochlorination of 2-methylbutane?

A. 8

B. 2

C. 4

D. 6

Answer: B

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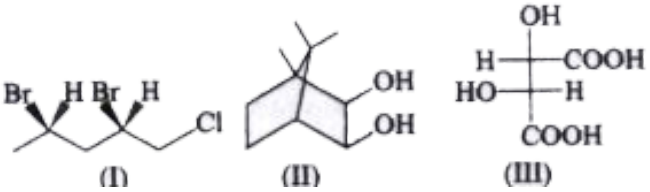
21. Which of the molecules are chiral?



A. I, II

B. II, III

C. I, III

D. All of these

Answer: A

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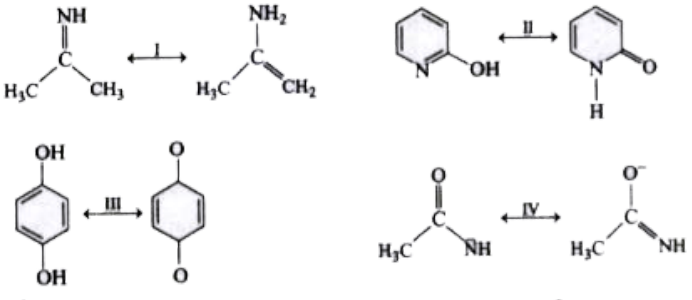
22. Which of the following pairs of structures represent tautomers?



A. I, II

B. III, IV

C. I, III

D. II, IV

Answer: A

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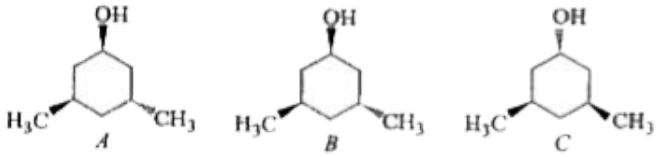
23. What is the relationship between the three compounds below?



A. A and B are diastereomers, B and Care diastereomers, and A and C are enantiomers

B. A and B are identical, B and Care diastereomers and A and Care diastereomers

C. A and B are enantiomers, B and C are diastereomers, and A and Care

diastereomers

D. A and B are enantiomers, B and C are diastereomers, and A and C are diastereomers

Answer: B

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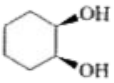
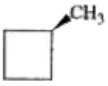
24. Which of the following molecule is expected to rotate the plane polarized light?

A. 

B. 

C. 

D. 

Answer: C

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25. Hydrogenation of the above compound in the presence of poisoned palladium catalyst

gives:

A. optically active compound

B. an optically inactive compound

C. a racemic mixture

D. a diastereomeric mixture

Answer: B

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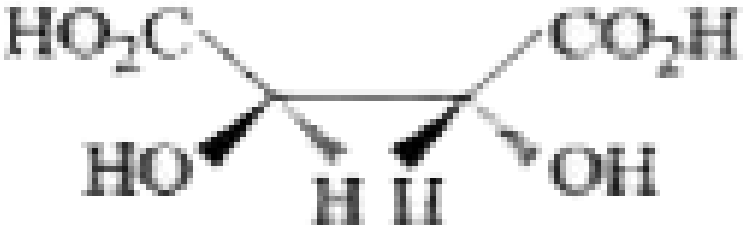
26. The absolute configuration of



A. S,R

B. S,S

C. R,R

D. R,S

Answer: C

Watch Video Solution

27. An enantiomerically pure acid is treated with racemic mixture of an alcohol having one chiral carbon. The ester formed will be

A. Optically active mixture

B. Pure enantiomer

C. Meso-compound

D. Racemic mixture

Answer: A

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28. Which of the following statements is not correct?

A. A meso compound has chiral centres but exhibits no optical activity

B. A meso compound has no chiral centres and thus are optically inactive

C. A meso compound has molecules which are superimposable on their mirror

images even though they contain chiral centres

D.

Answer: B

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29. The terms stereoisomers, enantiomers and diastereomers will refer

A. only to configurational isomers including geometric isomers

B. only to conformational isomers

C. to both configurational as well as conformational isomers

D. to neither configutational nor conformational isomers

Answer: A

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30. Which of the following statements is not correct?

A. Molecules that are superimposable on their mirror images are chiral

B. Molecule that are not superimposable on their mirror images are chiral

C. A compound whose molecules are chiral can exist as enantiomers

D. A compound whose molecules are achiral cannot exist as enantiomers

Answer: A

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31. The number of possible enantiomeric pairs that can be produced during mono chlorination of 2-methylbutan is

A. 2

B. 3

C. 5

D. 1

Answer: A

Watch Video Solution

32. Which of the following compounds will exhibit geometrical isomerism?

A. 1-Phenyl-2-butene

B. 3-Phenyl-1-butene

C. 2-Phenyl-1-butene

D. 1,1-Diphenyl-1-propene

Answer: A

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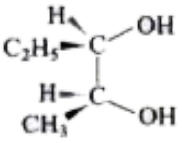
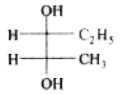
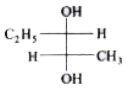
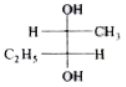
Questions Level Iii Single Correct Answer Type

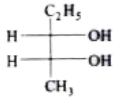
1. 

Fisher projection formula of this compound can be represented as:

A. 

B. 

C. 

D. 

Answer: A

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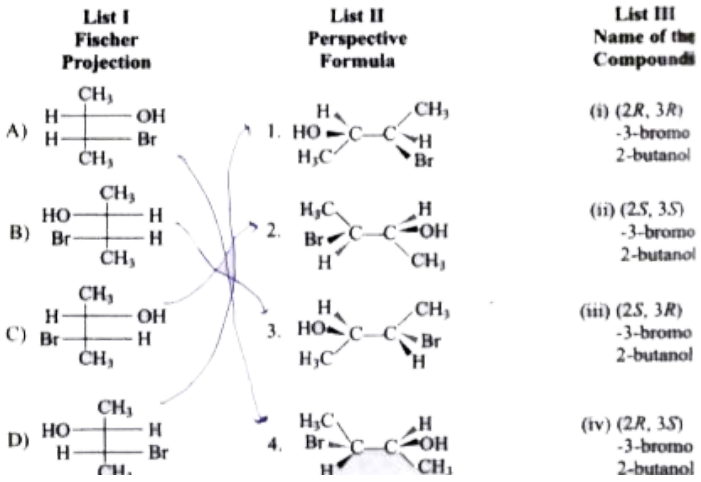
2. Match List I, List II, List III and select the correct answer from the given codes:



A. (A - 1-i), (B-2-ii), (C-3-iii), (D-4-iv)

B. (A-4-iii), (B-3-iv), (C-2-ii), (D-I-i)

C. (A-4-iv), (B-3-iii), (C-2-ii), (D-I-i)

D. (A-3-iii), (B-4-ii), (C-2-i), (D-I-iv)

Answer: B

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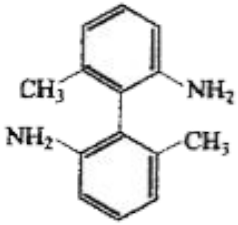
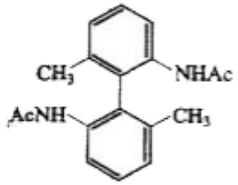
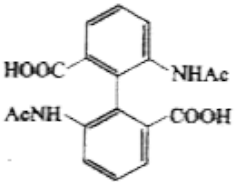
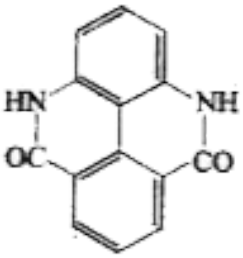
3. Select the optically inactive compound among the following

A. 

B. 

C. 

D. 

Answer: D

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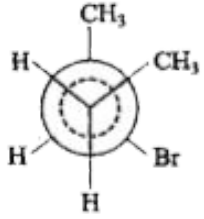
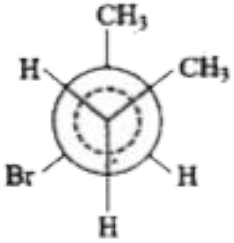
4. In the dehydrohalogenatino of 2-bromobutane, which conformation leads to the formation of cis-2 butene

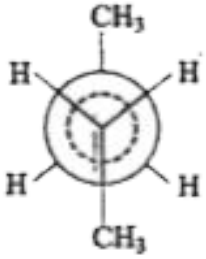
A.



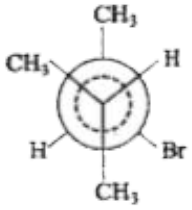
B.



C.



D.



Answer: A

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5. Which one of the following statement(s) is/are true for threo-butane-2,3-diol regarding their population of different conformers?

A. The most populated conformer will have the hydroxyl groups of the gauche position

B. The most populated conformer will have the hydroxyl groups at the anti position

C. All staggered conformations will be equally populated

D. Relative populations of different conformers is not predictable

Answer: A

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Questions Level Iii Multiple Correct Answer Type

1. Which of the following statements are correct?

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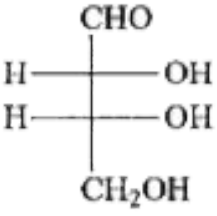
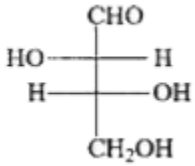
2. Which of the following structures represent erythro configurations?

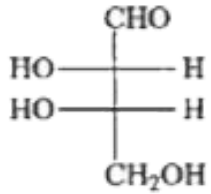
A.



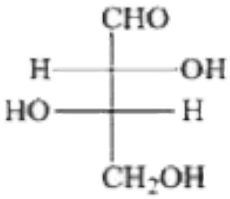
B.



C.



D.



Answer: A::C

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3. Which of the following statements is/are not correct?

A. 1.A compound whose molecule has D configuration will always be dextrorotatory

B. 2. A compound whose molecule has D configuration may be dextrotatory or laevorotatory

C. 3. A compound whose molecule has L configuration will always be laevorotatory

D. 4A compound whose molecule has L configuration may be dextrorotatory or laevorotatory

Answer: A::C

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4. Which of the following statements regarding diastereomers is/are not correct?

A. They have different physical properties

B. They cannot be separated from each other by fractional crystallization

C. They can be separated from each other by chromatographic methods

D. They have identical chemical properties towards both chiral and achiral reagents

Answer: B::D

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

A. Ph-N=N-Ph

B. 2,4-Dinitro phenyl hydrazone of acetone

C. Oxime of formaldehyde

D. Cyclohexan-1,2-diol

Answer: B::C::D

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

A. 2-Butene

B. Propene

C. 1-Phenyl propene

D. 2-Methyl-2-butene

Answer: A::C

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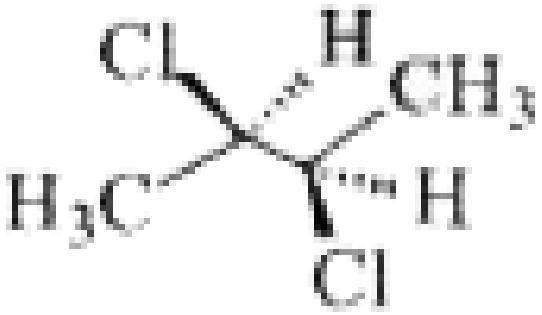
7. The correct statement(s) about the compound given below is/are:



A. The compound is optically active

B. The compound possesses centre of symmetry

C. The compound possesses plane of symmetry

D. The compound possesses axis of symmetry

Answer: A::D

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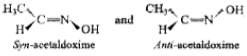
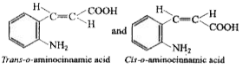
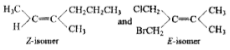
8. For Which of the following pairs of compounds are the correct notations given?

A. 

B. 

C. 

D. 

Answer: B::C::D

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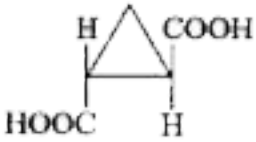
9. Which of the following represents a pair of enantiomers?

A.

B.



C.

D.

Answer: A::B

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10. Which of the following compounds shows tautomerism?

A. $NH_2 - \overset{\overset{O}{||}}{C} - NH_2$

B. $NH_2 - \overset{\overset{S}{||}}{C} - NH_2$

C. 

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

Answer: A::B::C::D

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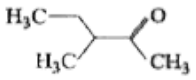
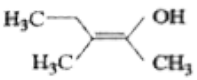
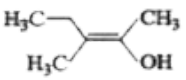
11. The correct statement(s) concerning the structures E, F and G is (are):


(E)


(F)


(G)

A. E, F and G are resonance structures

B. E, F and E, G are tautomers

C. F and G are geometrical isomers

D. F and G are diastereomers

Answer:

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Questions Level Iii Numerical Type

1. How many chiral carbon atoms are present in the open chain structure of glucose molecule?

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2. The number of geometrical isomers in the following compound $CH_3 - CH = CH - CH = CH - C_2H_5$ is

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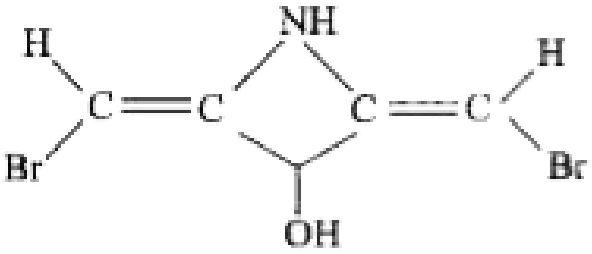
3. How many stereoisomers of the molecule are possible?



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4. Number of structural isomers for C_6H_{14} is:

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5. A compound is formed by substitution of two chlorine for two hydrogens in propane. The number of possible isomeric compounds is:

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Questions Level Iii Matching Column Type

1. Column I includes four organic compounds and Column II lists the number of optically active and inactive isomers. Match each entry of Column I with those given in Column II.

Column I	Column II
A) $HO_2CCHOHCO_2H$	p) No optically inactive isomers
B) $HO_2C(CHOH)_2CO_2H$	q) One optically inactive isomers
C) $HO_2C(CHOH)_3CO_2H$	r) two optically inactive isomers
D) $HO_2C(CHOH)_4CO_2H$	s) two optically active isomers

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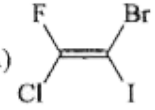
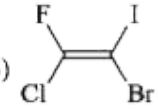
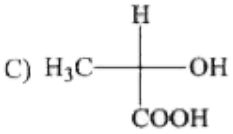
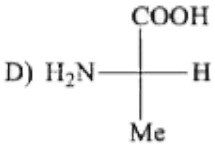
2. Match each entry of Column I with those given in Column II.

Column - I Compounds	Column - II Characteristics
A) 	p) S
B) 	q) Z
C) 	r) E
D) 	s) R

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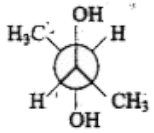
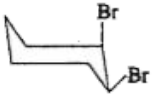
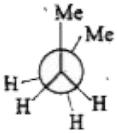
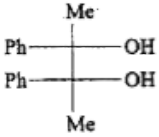
3. Column I includes four organic compounds and Column II lists the number of optically active and inactive isomers. Match each entry

of Column I with those given in Column II.

Column - I	Column - II
A) 	p) Meso
B) 	q) Anti conformer
C) 	r) Cis-isomer
D) 	s) Eclipsed conformers

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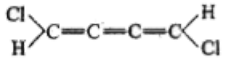
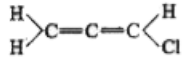
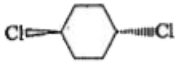
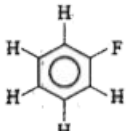
4. Column I includes four organic compounds and Column II lists the number of optically active and inactive isomers. Match each entry

of Column I with those given in Column II.

Column I	Column II
A) 	p) Polar molecule
B) 	q) Optically active
C) 	r) Optically inactive
D) 	s) Symmetry element

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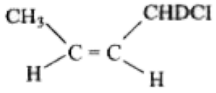
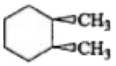
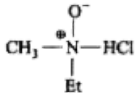
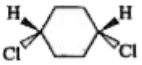
5. Column I includes four organic compounds and Column II lists the number of optically active and inactive isomers. Match each entry

of Column I with those given in Column II.

Column - I (Molecule)	Column - II (Property)
A) 	p) Optically active
B) 	q) Optically inactive
C) 	r) Plane of symmetry
D) 	s) Centre of symmetry

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Questions Level Iii Statement Type

1. Statement 1 : Both cis-1,3-dimethyl cyclobutane and trans-1,3-dimethyl

cyclobutane are optically inactive.

Statement 2 : cis-1,3-Dimethyl cyclobutane has the plane of symmetry, whereas transform has the centre of symmetry.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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2. Statement1 : The cis form of

$$\left(CH_3 - \underset{\underset{Cl}{|}}{CH} - CH = CH - \underset{\underset{Cl}{|}}{CH} - CH_3\right)$$

exist in three-diastereomers.

Statement 2 : One form is optically inactive due to the presence of centre of symmetry.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 2

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 2

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: C

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3. Statement 1 : Molecules that are non-superimposable on their mirror images are chiral.

Statement 2 : All chiral molecules have chiral centres.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 3

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 3

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: C

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4. Statement1 : Meso tartaric acid is optically inactive

Statement 2 : Meso tartaric acid has plane of symmetry.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 4

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 4

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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5. Statement 1 , All compounds having C=C bond exhibit geometrical isomerism.

Statement 2 : Rotation about C=C bond is restricted.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 5

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 5

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: D

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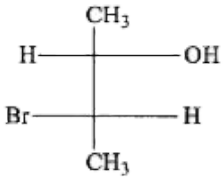
Questions Level Iii Linked Comprehension Type

1. The prefixes 'erythro' and 'threo' are used for distinguishing a pair of enantiomers containing two chiral carbon atoms when two of the atoms or groups on each chiral carbon atom are the same while the third is different. The stereoisomer, in which the two identical groups are on the same side of the Fischer projection formula, is called the erythro isomer while the isomer, in which the two

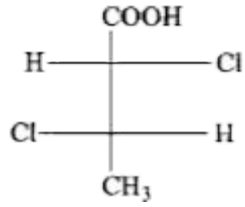
identical groups are on the opposite sides of the Fischer projection formula, is called the threo isomer.

Erythro isomer among the following is :

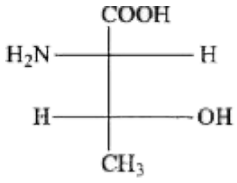
A.

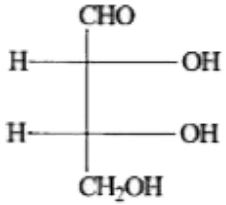


B.



C.





D.

Answer: D

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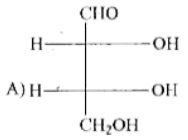
2. The prefixes 'erythro' and 'threo' are used for distinguishing a pair of enantiomers containing two chiral carbon atoms when two of the atoms or groups on each chiral carbon atom are the same while the third is different.

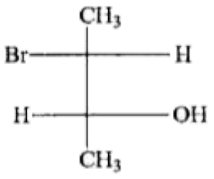
The stereoisomer, in which the two identical groups are on the same side of the Fischer projection formula, is called the erythro isomer while the isomer, in which the two identical groups are on the opposite sides of the Fischer projection formula, is called the threo isomer.

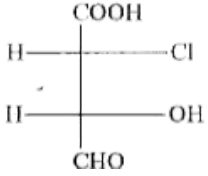
Erythro isomer among the following is :

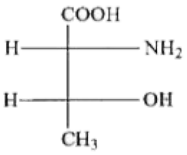
A.



B.



C. 

D. 

Answer: B

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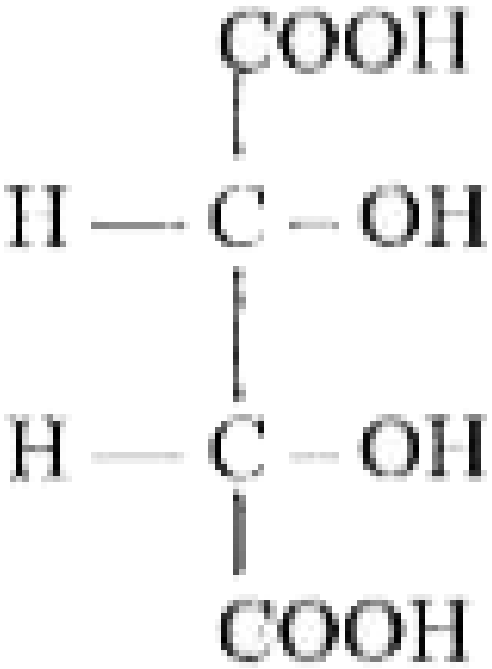
3. The prefixes 'erythro' and 'threo' are used for distinguishing a pair of enantiomers containing two chiral carbon atoms when two of the atoms or groups on each chiral carbon

atom are the same while the third is different. The stereoisomer, in which the two identical groups are on the same side of the Fischer projection formula, is called the erythro isomer while the isomer, in which the two identical groups are on the opposite sides of the Fischer projection formula, is called the threo isomer.

Select the correct statement about the

following compound:



A. It has two chiral carbons

B. It is erythro isomer

C. It has plane of symmetry

D. All of these

Answer: D

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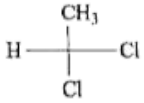
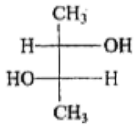
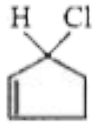
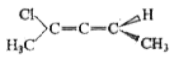
4. Which of the following compounds is optically inactive?

A. 

B. 

C. 

D. 

Answer: A

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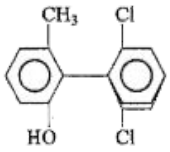
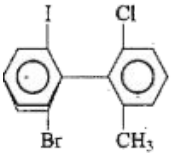
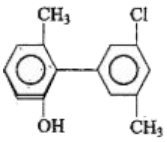
5. Presence of chiral center is not an essential condition to show optical isomerism. Essential condition is compound should show non-superimposable mirror image. Allenes does not contain chiral center but show optical isomerism when different groups are attached on double bonded carbons. Biphenyls also show optical isomerism when both rings are

perpendicular to each other and any ring should not contain plane of symmetry.

Which of the following biphenyl compounds is optically active?

A. 

B. 

C. 

D. all are correct

Answer: B

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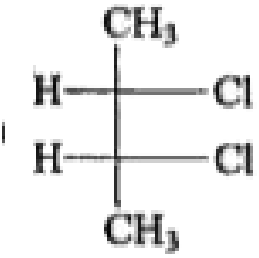
6. Presence of chiral center is not an essential condition to show optical isomerism. Essential condition is compound should show non-superimposable mirror image. Allenes does not contain chiral center but show optical isomerism when different groups are attached on double bonded carbons. Biphenyls also show optical isomerism when both rings are

perpendicular to each other and any ring should not contain plane of symmetry.

Which of the following compounds can be resolved in enatiomeric form? :



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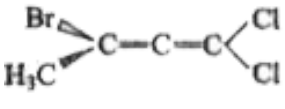

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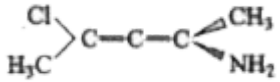

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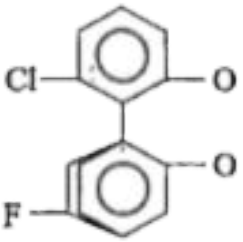
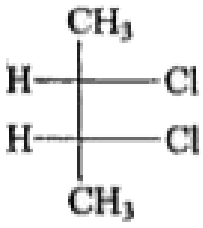
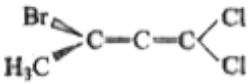
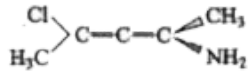
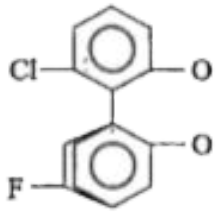


A.



B. 

C. 

D. 

Answer: C

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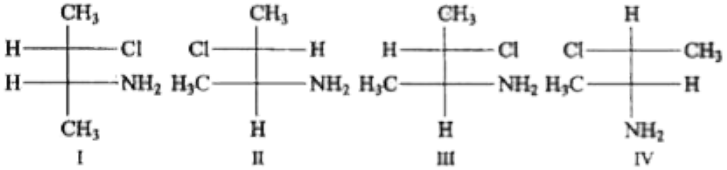
7. R, S-configuration is a useful tool for determination of enantiomers, diastereomers

and homomers. If configuration of all chiral centres are opposite then structures are enantiomers, if all chiral centers have same configuration then they are homomers and if some have same configuration and some have opposite configuration then they are diastereomers.



Among above structures find out diastereomeric structures:

A. II and III

B. I and II, III and IV

C. I and IV

D. III and IV

Answer: B

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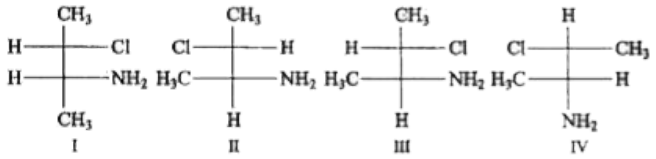
8. R, S-configuration is a useful tool for determination of enantiomers, diastereomers and homomers. If configuration of all chiral centres are opposite then structures are

enantiomers, if all chiral centers have same configuration then they are homomers and if some have same configuration and some have opposite configuration then they are diastereomers.



Find out homomers:

A. I and III

B. II and IV

C. I and IV

D. III and IV

Answer: C

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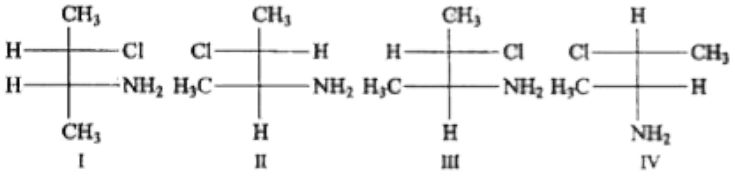
9. R, S-configuration is a useful tool for determination of enantiomers, diastereomers and homomers. If configuration of all chiral centres are opposite then structures are enantiomers, if all chiral centers have same configuration then they are homomers and if some have same configuration and some have opposite configuration then they are

diastereomers.



Which of the following is not diastereomer?

A. I and III

B. II and III

C. III and IV

D. II and IV

Answer: D

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