Exercise-1

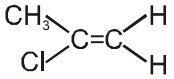
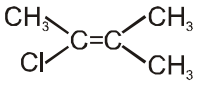
ONLY ONE OPTION CORRECT TYPE

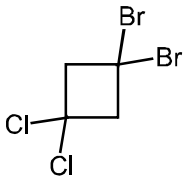
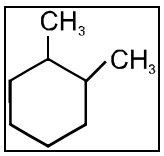
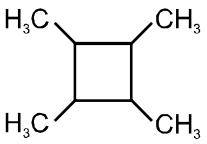
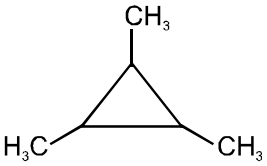
Section (A) : Geometrical isomerism

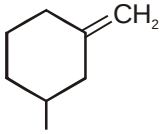
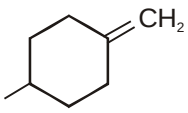
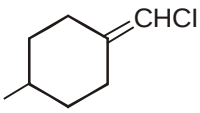
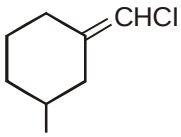
1. Stereoisomers have different : .
(1) Molecular formula (2) Structural formula (3) Configuration (4) Molecular mass

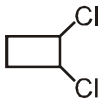
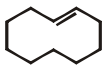
2. Which can show the cis-trans isomerism :
(1) $ClCH_2CH_2Cl$ (2) $Cl_2C{=}{=}CH_2$ (3) $Cl_2C{=}{=}CCl_2$ (4) ClCH ==CHCl

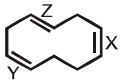
3. Which of the following compounds will not show geometrical isomerism :
(1) Cyclooctene (2) 1-Bromo-2-chloroethene
(3) 1-Phenylpropene (4) 2-Methyl-2-butene

4. Which of the following compound not show geometrical isomerism
(1)  (2) $CH_3–C{\equiv}C–CH_3$ (3)  (4) All of these)

5. Which of the following compound can not show geometrical isomerism ?
(1)  (2)  (3)  (4) 

6. The geometrical isomerism is shown by :-
(1)  (2)  (3)  (4) 

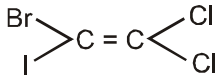
7. Which of the following will from geometrical isomers :
(1)  (2) $CH_3CH{=}NOH$ (3)  (4) All of these

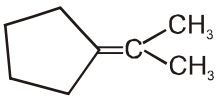
8. Types of geometrical isomerism shown at point X, Y and Z of the following compound respectively are


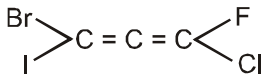
	X	Y	Z
(1)	cis	cis	trans
(2)	cis	trans	trans
(3)	trans	cis	cis
(4)	cis	trans	cis

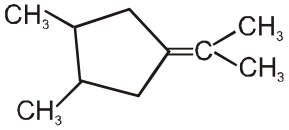
9. Which of the following compounds does not have geometrical isomers :
(1) 2-Pentenoic acid (2) 2-Butenoic acid (3) 3-Pentenoic acid (4) 3-Butenoic acid

10. Which of the following compound can show geometrical isomerism

(1) 

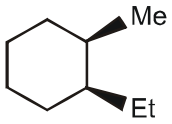
(2) 

(3) 

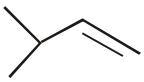
(4) 

11. Which of the following will show cis-trans isomerism :-

(1) 

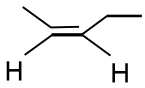
(2) 

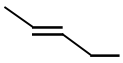
(3) 

(4) 

Section (B) : CIP Rules (E/Z Naming) & Physical Properties of G.I

1. Identify (Z) - 2 - pentene :

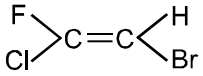
(1) 

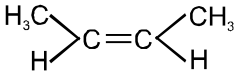
(2) 

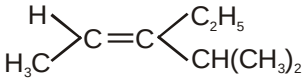
(3) 

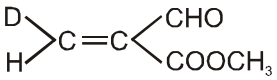
(4) 

2. The 'E'-isomer is/are :

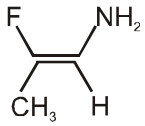
(1) 

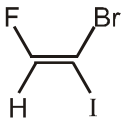
(2) 

(3) 

(4) 

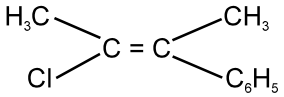
3. Determine the double bond stereochemistry (E or Z) for the following molecules

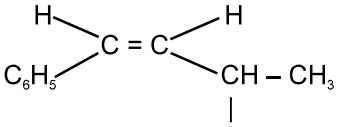


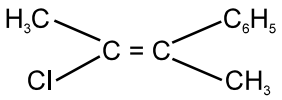


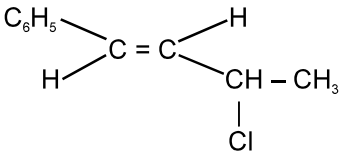
(1) A : E ; B : E (2) A : Z ; B : Z (3) A : E ; B : Z (4) A : Z ; B : E

4. The correct stereochemical formula of Trans-3-chloro-1-phenylbut-1-ene is

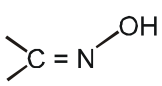
(1) 

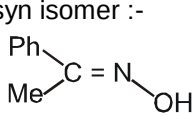
(2) 

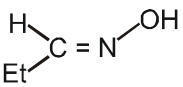
(3) 

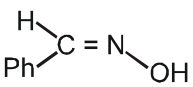
(4) 

5. Which of the following is a syn isomer :-

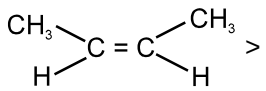
(1) 

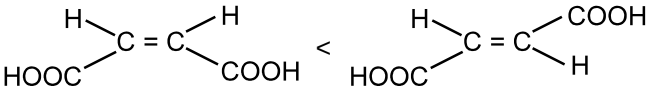
(2) 

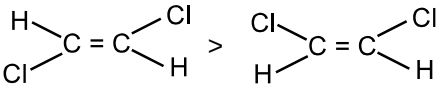
(3) 

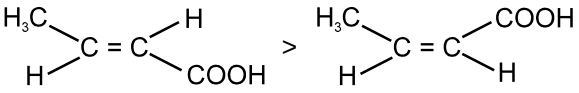
(4) 

6. The correct order/s for the given pair of isomers is

(1)  (Melting point)

(2)  (Dipole moment)

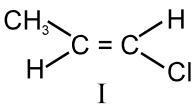
(3)  (Boiling point)

(4)  (Water solubility)

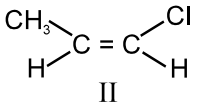
7. Out of the given two isomers which property for second is greater than first.

(1) Dipole moment (2) Boiling point (3) Solubility in H_2O (4) Melting point

8. Which of the following is correct set of physical properties of the geometrical isomers


I

&


II

	Dipole moment	Boiling point	Melting point	Stability
(1)	I > II	I > II	II > I	I > II
(2)	II > I	II > I	II > I	II > I
(3)	I > II	I > II	I > II	I > II
(4)	II > I	II > I	I > II	I > II

9. Out of the following compounds, which will have a zero dipole moment ?

(1) 1, 1 – Dichloro ethylene (2) cis 1, 2 – Dichloro ethylene

(3) trans 1, 2 – Dichloro ethylene (4) Trans 1, 2 – Dichloro propene

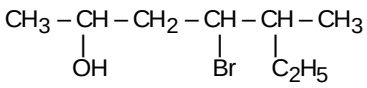
Section (C) : Chiral carbon and Projection Formula

1. Chiral molecules are :

(1) Superimposable on their mirror image (2) Not superimposable on their mirror image

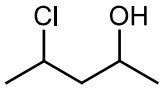
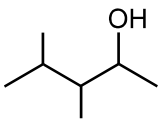
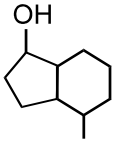
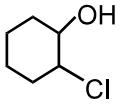
(3) unstable molecules (4) capable of showing geometrical isomerism

2. Number of chiral carbon persent in the following compound :

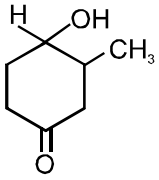


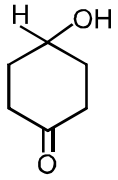
(1) 2 (2) 3 (3) 4 (4) 5

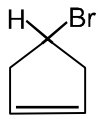
3. The compound which has maximum number of chiral centres is

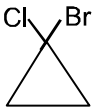
(1)  (2)  (3)  (4) 

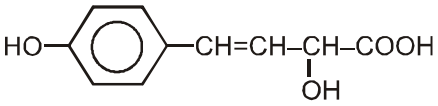
4. Which of the following compounds possesses a chiral centre :

(1) 

(2) 

(3) 

(4) 

5. 

will shows

(1) Geometrical isomerism only (2) Optical isomerism only

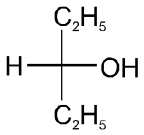
(3) Geometrical and optical isomerism (4) Neither geometrical nor optical isomerism

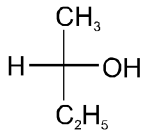
6. Which of the following have chiral carbon ?

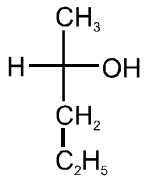
(1) 1–Butanol (2) 1–Propanol (3) 2–Chlorobutane (4) 4–Hydroxyheptane

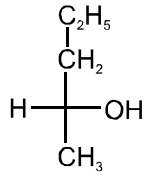
Section (D) : R/S & D/L Naming.

1. Which of the following is the structure of (S)-Pentan-2-ol is ?

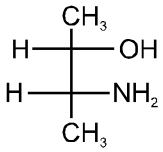
(1) 

(2) 

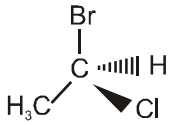
(3) 

(4) 

2. The correct configuration assigned for given compound :

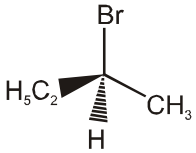


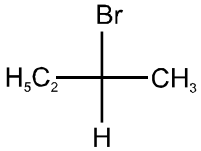
(1) 2R, 3R (2) 2S, 3S (3) 2R, 3S (4) 2S, 3R

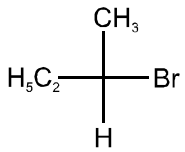
3. The configuration of the given compound is : 

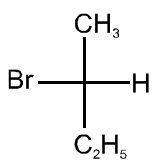
(1) E (2) R (3) S (4) Z

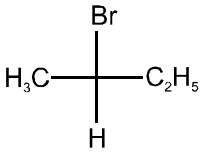
4. Which Fisher projection represents the given wedge dash structure :

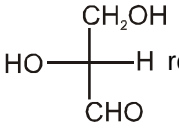


(1) 

(2) 

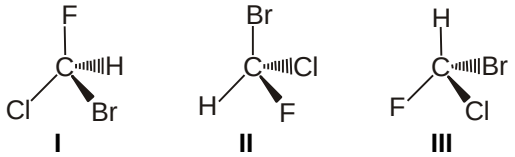
(3) 

(4) 

5.  represents the Fischer projection formula :

(1) D (2) L (3) d (4) ℓ

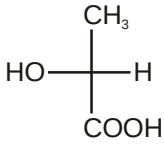
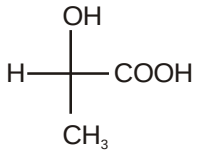
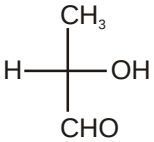
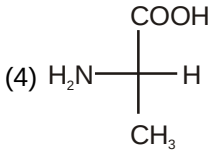
6. Which of the following have same configuration.



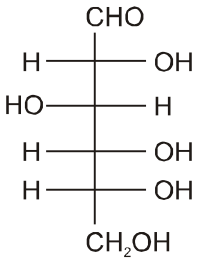
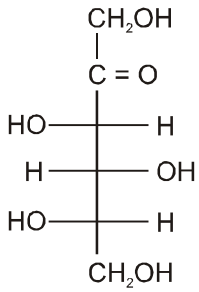
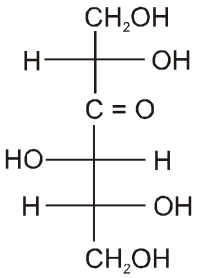
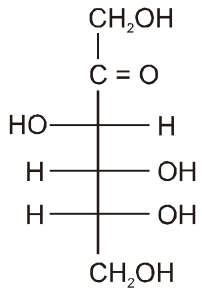
I **II** **III**

(1) I & II (2) II & III (3) I & III (4) All

7. Which has D configuration.

(1)  (2)  (3)  (4) 

8. D-Fructose ($C_6H_{12}O_6$) has IUPAC name (3L,4D, 5D)1, 3, 4, 5, 6-Pentahydroxyhexan-2-one. Its last asymmetric carbon atom (C^*_5) has D-configuration. The correct stereochemical formula of D-Fructose is

(1)  (2)  (3)  (4) 

9. Which of the following is not true for maleic acid and fumaric acid.

(1) Configurational isomers (2) Stereo isomers

(3) Z and E isomers (4) Optical isomers

Section (E) : Element of Symmetries (POS, COS)

1. Which statement is wrong about symmetry ?

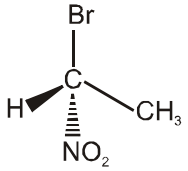
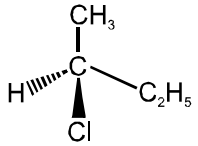
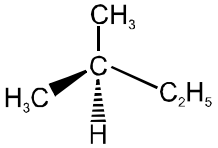
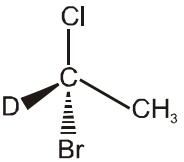
(1) Plane of symmetry is an imaginary plane which bisects the molecule in two equal halves in such a way that each half of the molecule is the mirror image of the other half.

(2) Centre of symmetry is the point in a molecule through which if the straight line is drawn from any part of the molecule and if then this line encounters identical groups at equal distances in opposite direction.

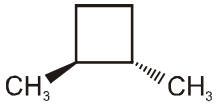
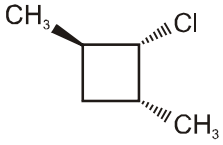
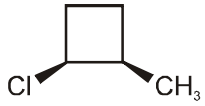
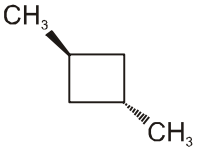
(3) A molecule which does not possess any element of symmetry is called asymmetric molecule.

(4) A molecule which does not possess any element of symmetry is called symmetric molecule.

2. Which of the following compound posses plane of symmetry ?

(1)  (2)  (3)  (4) 

3. Which of the following are chiral :

(1)  (2)  (3)  (4) 

(1) 1, 2, 3 (2) 1, 2, 4 (3) 2, 3, 4 (4) 1, 3, 4

Section (F) : Definition and Properties of Enantiomers, Diastereomers, Meso compounds

1. Which of the following statements is not correct :

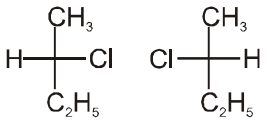
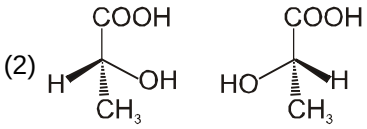
(1) Enantiomers are Eessentially chiral and optically active

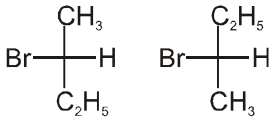
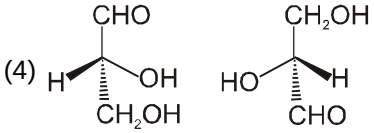
(2) Diastereomers are not neccesarily chiral and optically active

(3) All geometrical isomers are diastereomers

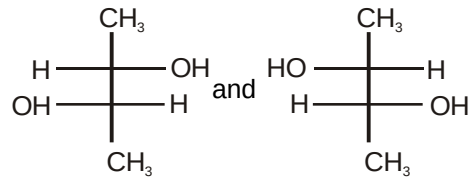
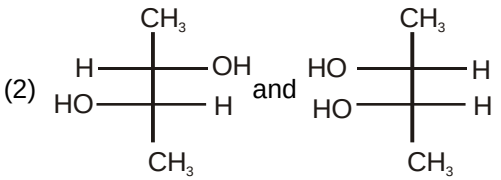
(4) All diastereomers are chiral and optically active

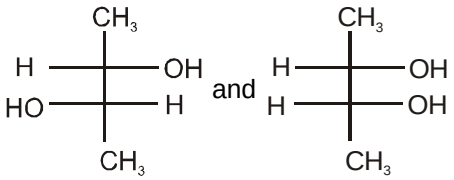
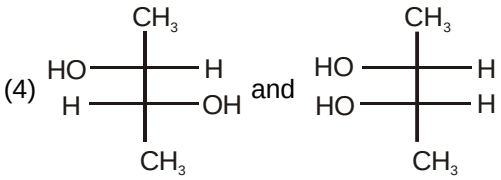
2. Which is not the pair of enantiomers ?

(1)  (2) 

(3)  (4) 

3. Which of the following pairs of compounds are enantiomers :

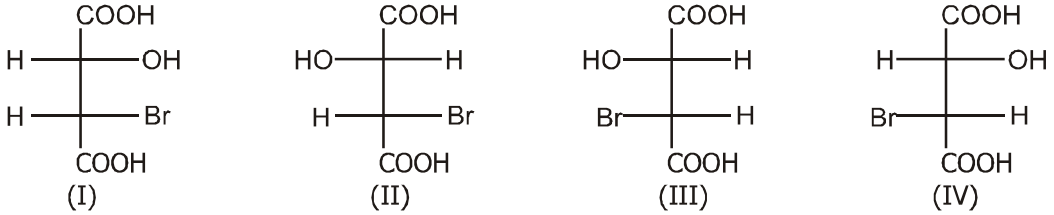
(1)  (2) 

(3)  (4) 

4. Stereoisomers which are not mirror image of each other, are called :

(1) Enantiomers (2) Tautomers (3) Meso (4) Diastereomers

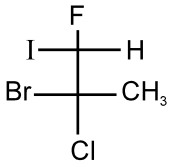
5. Which one among the following is not diastereomeric pair.



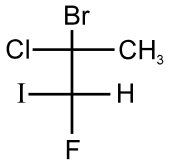
(I) (II) (III) (IV)

(1) I and III (2) I and II (3) II and III (4) I and IV

6. What is the relationship between (I) & (II)



(I)



(II)

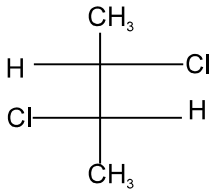
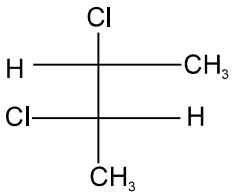
(1) Enantiomer (2) Diastereomers

(3) Constitutional isomer (4) Identical molecules

Section (G) : specific rotation, observed rotation, optical purity and enantiomeric excess Racemic mixture, Optical Resolution

1. The instrument which can be used to measure optical activity, i.e., specific rotation:

(1) Refractometer (2) Photometer (3) Voltmeter (4) Polarimeter

2. If optical rotation produced by  is + 36º then that produced by  is

(1) –36º (2) 0º (3) +36º (4) unpredictable

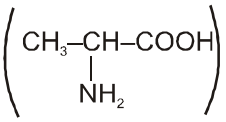
3. Meso form of tartaric acid is

(1) Dextorotatory

(2) laevorotatory

(3) neither Laevo not dextro rotatory due to internal compensation

(4) A mixture of equal quantities of dextro and leavorotatory forms

4. The racemic mixture of Alanine  can be resolved by using,

(1) (+)-2-Butanol (2) (ℓ)-2-Chlorobutanoic acid

(3) (±) -2-Butanol (4) (dℓ mix)-2-Chlorobutanoic acid

(1) 1 & 2 only (2) 1 & 3 only (3) 2 & 4 only (4) 3 & 4 only

5. Which of the following pair of isomers can not be separated by fractional crystallisation or fractional distillation:

(1) Maleic acid and Fumaric acid (2) (+)-Tartaric acid and meso-tartaric acid

(3) $CH_3-\underset{\underset{NH_2}{|}}{CH}-COOH$ and $H_2N–CH_2–CH_2–COOH$ (4) (+)-lactic acid and (–)-lactic acid

Section (H) : Conformations, strains and stability

1. Which statement is **FALSE** :

(1) When value of dihedral angle is 180º then this conformation is called anti conformation.

(2) When ϕ = 60º then this conformation is called gauche.

(3) When ϕ = 0º then this conformation is called eclipsed conformation.

(4) Other than staggered and eclipsed conformation are called gauche conformations.

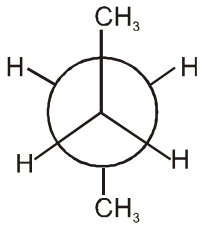
2. The eclipsed and staggered conformation of ethane is due to –
(1) Free rotation about C–C single bond (2) Restricted rotation about C–C single bond
(3) Absence of rotation about C–C bond (4) None of the above

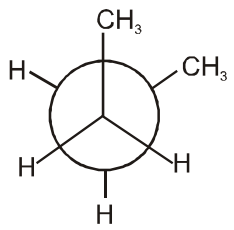
3. The Baeyer's angle strain is expected to be maximum in
(1) Cyclodecane (2) Cyclopentane (3) Cyclobutane (4) Cyclopropane

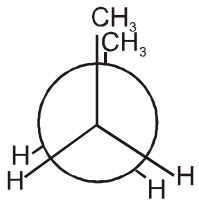
4. The minimum torsional strain developed in butane is at dihedral angle(s)
(1) 0º, 108º (2) 120°, 240º (3) 60°, 180°, 300° (4) 60°, 120°, 180°

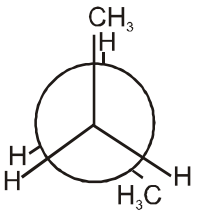
Section (I) : Conformational analysis of Ethane, Propane, Butane and Substituted butane

1. In the following the most stable conformation of *n*-butane is :

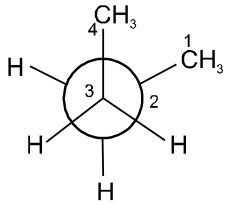
(1) 

(2) 

(3) 

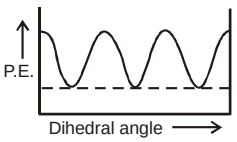
(4) 

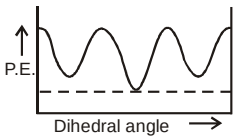
2. Newman projection of Butane is given,C-2 is rotated by 120º along C_2-C_3 bond in anticlockwise direction the conformation formed is :

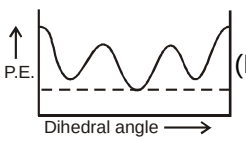


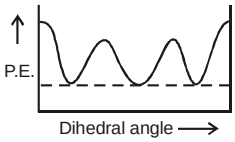
(1) anti (2) fully eclipsed (3) gauche (4) partially eclipsed

3. Which of the following is correct P.E. diagram for propane and butane respectively ?

(I) 

(II) 

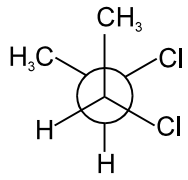
(III) 

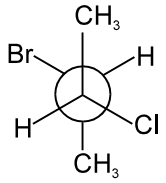
(IV) 

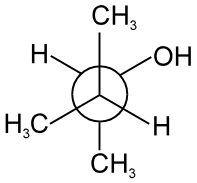
(1) I & II (2) I & III (3) II & IV (4) IV & II

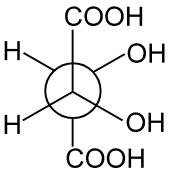
4. The dipole moment of 1, 2-Dichloroethane is 1.12 D. Which statement is correct about this compound.
(1) It exists mainly in fully eclipsed conformation.
(2) It exists only in anti conformation.
(3) The polarity is due to gauche (skew) conformation.
(4) The anti conformation has highest dipole moment.

5. Which of the following is an achiral molecule?

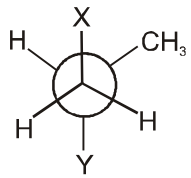
(1) 

(2) 

(3) 

(4) 

6. The newman projection formula of 2,3-dimethylbutane is given as



X,Y respectively can be :

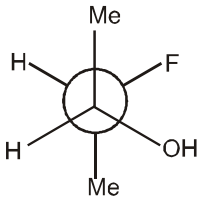
(1) $-CH(CH_3)_2$ and H (2) $-CH_3$ and $-C_2H_5$ (3) $-C_2H_5$ and $-CH_3$ (4) H and $-CH(CH_3)_2$

Section (J) : Conformational analysis of compound having intramolecular H-bonding.

1. In 2-Fluoroethanol which conformer will be most stable ?

(1) Eclipsed (2) Skew (3) Gauche (4) Staggered

2. The true statement about the following corformation is :



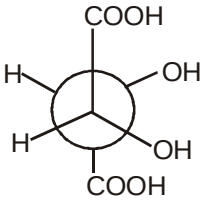
(1) It has maximum angle strain.

(2) It does not have eclipsing strain (tortional strain).

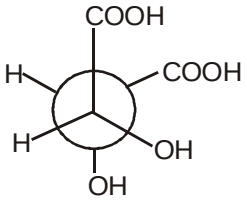
(3) It does not have any intramolecular hydrogen bonding.

(4) It has maximum vander waal strain.

3. The structures I and II are



I

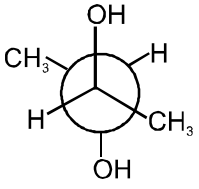


II

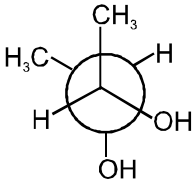
(1) Conformational diastereomers (2) Configurational enantiomers

(3) Configurational diastereomers (4) Identical

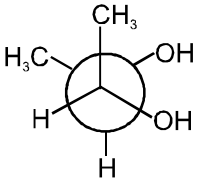
4. Incorrect about the compounds I, II, III is :



(I) ,



(II) ,



(III)

(1) I & II are diastereomers (2) I & III are identical
(3) I| & III are diastereomers (4) I & II are optically active

Section (K) : Cyclohexane

1. The least stable conformation of cyclohexane is
(1) Boat (2) Chair (3) Twist boat (4) Half chair

2. Flagpole interaction is present in :
(1) Boat form of cyclohexane (2) Chair form of cyclohexane
(3) Anti form of n-butane (4) Fully eclipsed form of n-butane

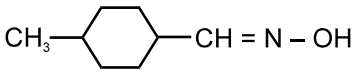
3. Chair form of cyclohexane is more stable than boat form because :
(1) In chair form carbons are in staggered form and in boat form carbons are in eclipsed form
(2) In chair form carbons are in eclipsed form and in boat form all the carbons are in staggered form
(3) Bond angle in chair form is 111° and bond angle in boat form is 109.5°
(4) Bond angle in chair form is 109.5° and in boat form 111°

Section (L) : Counting of stereoisomers

1. How many geometrical isomers are possible for the given compound ?
Ph – CH = CH – CH = CH – COOH
(1) 3 (2) 4 (3) 2 (4) 1

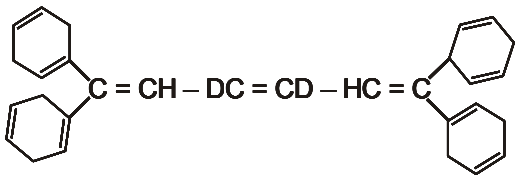
2. How many geometrical isomers are possible for the given compound ?
CH_3 – CH = CH – CH = CH – CH = CH_2
(1) 2 (2) 4 (3) 6 (4) 8

3. How many geometrical isomers are possible for the given compound ?



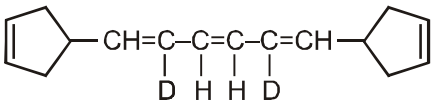
(1) 2 (2) 4 (3) 6 (4) 8

4. Total number of geometrical isomers in the given compound is :



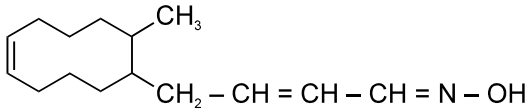
(1) 2 (2) 4 (3) 6 (4) 8

5. Total number of geometrical isomers in the given compound is :



(1) 3 (2) 6 (3) 8 (4) 16

6. No. of Geometrical isomers for following compound is :



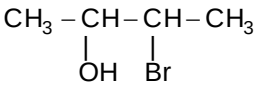
(1) 8 (2) 16 (3) 32 (4) 10

7. Select the correct options for molecular formula $C_2H_2Cl_2$:

(1) The total number of isomers is 4. (2) All the structures show geometrical isomerism.

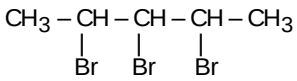
(3) All isomers have 5σ bonds and one π bond. (4) Its has linear shape.

8. Total number of stereoisomers of compound is :



(1) 2 (2) 4 (3) 6 (4) 8

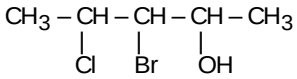
9.



Total number of stereoisomers in above compound is :

(1) 6 (2) 4 (3) 8 (4) 16

10.



Total number of stereoisomers in above compound is :

(1) 6 (2) 4 (3) 8 (4) 16

11. How many meso steroisomers are possible for 2, 3, 4–pentanetriol :

(1) 1 (2) 2 (3) 3 (4) None

12. The total number of isomers for C_4H_8 is

(1) 5 (2) 6 (3) 7 (4) 8

Exercise-2

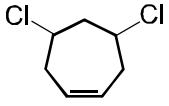
ONLY ONE OPTION CORRECT TYPE

1. Which is incorrect statement about geometrical isomers.

(1) Geometrical isomers can be separated by fractional distillation.

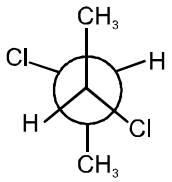
(2) In two geometrical isomers the distance between two particular groups at the ends of the restricted bond must be changed.

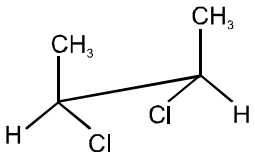
(3) In cycloalkenes, geometrical isomerism exist across C=C with ring size equal to or greater than 8 carbon atom.

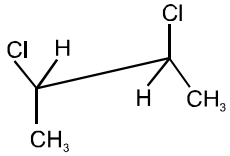
(4) 

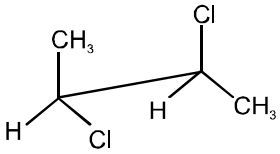
doesn't show geometrical isomerism because it has only 7 C atoms in ring.

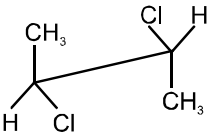
2. Which of the following sawhorse representation is correct for the given Newman projection.



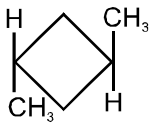
(1) 

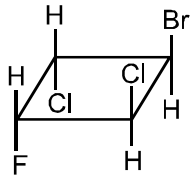
(2) 

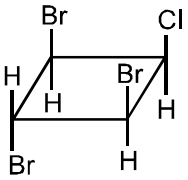
(3) 

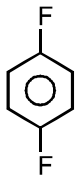
(4) 

3. Which of the following compound has plane of symmetry (POS) but not centre of symmetry (COS) ?

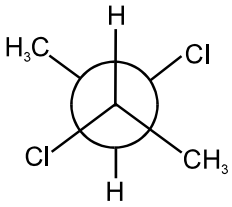
(1) 

(2) 

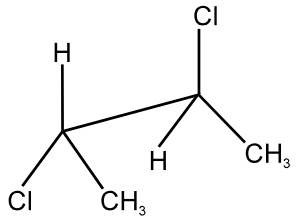
(3) 

(4) 

4. Which of the following statement regarding the projections shown below is true ?



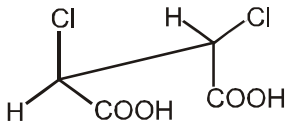
(a)



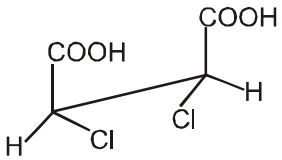
(b)

(1) 'a' and 'b' both represent the same configuration
(2) Both 'a' and 'b' are optically active
(3) 'b' alone is optically active
(4) 'a' alone is optically active

5. The structures represent

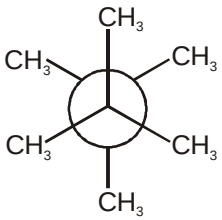


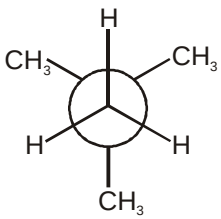
&

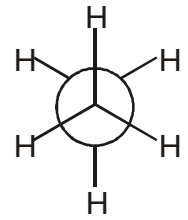


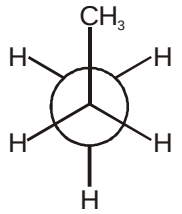
(1) geometrical isomers
(2) positional isomers
(3) conformational isomers
(4) configurational isomers

6. In which conformation torsional energy (rotational barrier) is minimum.

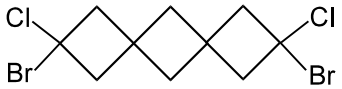
(1) 

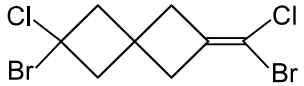
(2) 

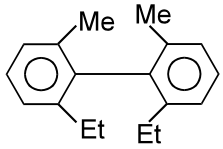
(3) 

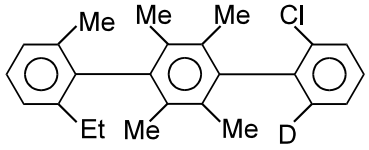
(4) 

7. Which of the following is chiral ?

(1) 

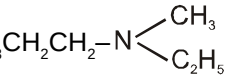
(2) 

(3) 

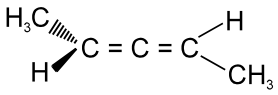
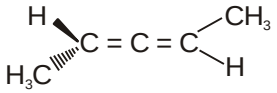
(4) 

8. Which of the following amine is optically active ?

(1) CH_3NH_2 (2) $CH_3NHC_2H_5$

(3)  (4) sec-Butylamine

9. The following molecules are :

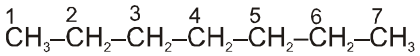
 

(1) Enantiomers (2) Diastereomers (3) Identical (4) Conformers

10. A recemic mixture contains dextrorotatory and laevorotatory isomers in the proportion –

(1) 2 : 1 (2) 1 : 1 (3) 1 : 5 (4) 3 : 1

11. Consider the following organic compound :



To make it a chiral compound, the attack should be on carbon atom no.

(1) 1 (2) 3 (3) 4 (4) 7

12. The number of isomers for the compound with molecular formula $C_2BrClFI$ are :

(1) 2 (2) 6 (3) 4 (4) 3

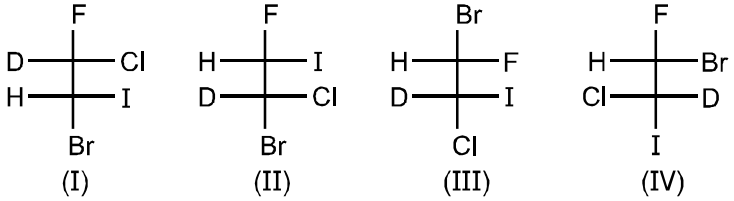
13. How many n-octene can show geometrical isomerism ?

(1) 2 (2) 6 (3) 4 (4) 3

14. Total number of P.I. (x) of tetrachloro cyclobutane can show geometrical isomers (y) than find out x + y:

(1) 2 (2) 6 (3) 8 (4) 7

15. Number of fractions on fractional distillation of mixture of :



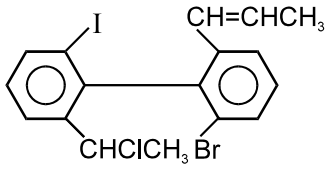
(I) (II) (III) (IV)

(1) 2 (2) 1 (3) 4 (4) 3

16. Total number of optically active stereoisomers of $CH_3-\underset{Cl}{CH}-\underset{Cl}{CH}-\underset{Cl}{CH}-CH_3$.

(1) 2 (2) 6 (3) 4 (4) 3

17. How many spatial orientations are possible in the following compound ?



(1) 2 (2) 6 (3) 4 (4) 8

18. Total number of stereoisomers of compound is :

$CH_3-\underset{OH}{CH}-\underset{Br}{CH}-CH_3$

(1) 2 (2) 6 (3) 4 (4) 3

19. Total number of optically active stereoisomers of tartaric acid are

(1) 2 (2) 1 (3) 4 (4) 3

20. The total number of ketones (including stereo isomers) with the molecular formula $C_6H_{12}O$ is :

(1) 3 (2) 7 (3) 4 (4) 8

21. The sum of total stereoisomers and fractions on the fractional distillation of 2, 3- Dichloropentane is.

(1) 2 (2) 6 (3) 4 (4) 3

22. Total number of optically stereoisomers of $CH_3-\underset{Cl}{CH}-CH=CH-\underset{Cl}{CH}-CH_3$ are :

(1) 2 (2) 6 (3) 4 (4) 3

23. Total number of optical active stereoisomers of the following compound are :

$CH_3-CH=CH-CHCl-CH=C=CH-CH=CH-CH_3$

(1) 8 (2) 16 (3) 32 (4) 12

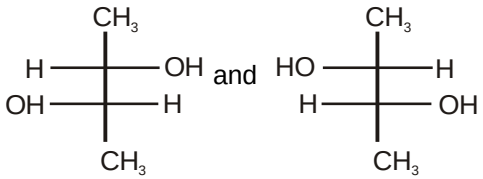
24. How many total cyclic isomers with molecular formula $C_3H_3Cl_2Br$ are possible.

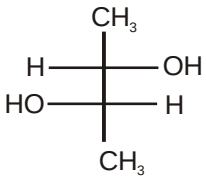
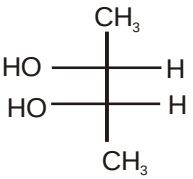
(1) 10 (2) 6 (3) 8 (4) 12

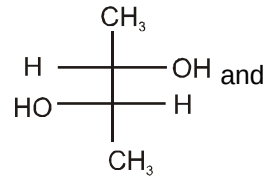
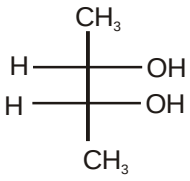
Exercise-3

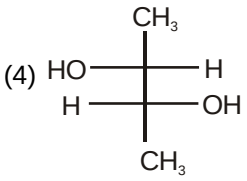
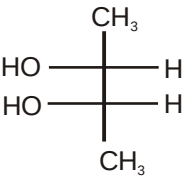
PART - I : NEET / AIPMT QUESTION (PREVIOUS YEARS)

1. Which of the following pairs of compounds are enantiomers : **[AIPMT-2003]**

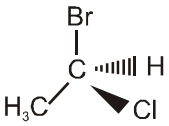
(1)  and

(2)  and 

(3)  and 

(4)  and 

2. The configuration of the given compound is : **[AIPMT-2005]**



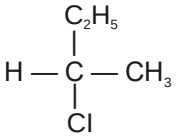
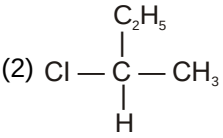
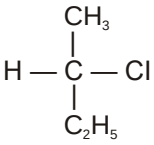
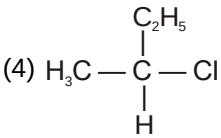
(1) E (2) R (3) S (4) Z

3. Which one of the following pair represents stereo isomerism :- **[AIPMT-2005]**
(1) Linkage isomerism and Geometrical isomerism
(2) Chain isomerism and Rotational isomerism
(3) Optical isomerism and Geometrical isomerism
(4) Structural isomerism and Geometrical isomerism.

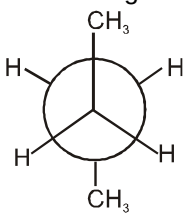
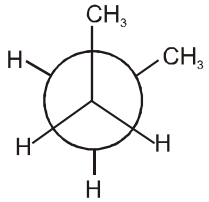
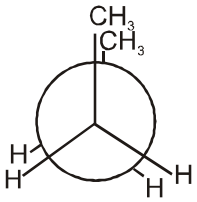
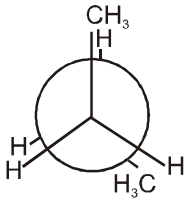
4. Which of the following is not chiral ? **[AIPMT-2006]**
(1) 2–Butanol (2) 2, 3–Dibromo pentane
(3) 3–Bromo pentane (4) 2–Hydroxy propanoic acid

5. Among the following which one can have a meso form ? **[AIPMT-2006]**
(1) $CH_3CH(OH)CH(Cl)C_2H_5$ (2) $CH_3CH(OH)CH(OH)CH_3$
(3) $C_2H_5CH(OH)CH(OH)CH_3$ (4) $HOCH_2CH(Cl)CH_3$

6. $CH_3 - CHCl - CH_2 - CH_3$ has a chiral centre which one of the following represents its R configuration : **[AIPMT-2007]**

(1) 
(2) 
(3) 
(4) 

7. In the following the most stable conformation of *n*-butane is : **[AIPMT-2010]**

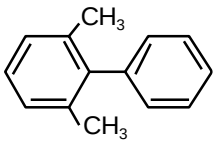
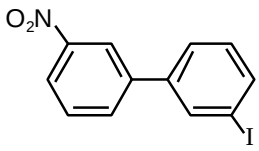
(1) 
(2) 
(3) 
(4) 

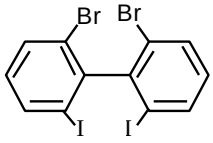
8. Which of the following acids does not exhibit optical isomerism ? **[AIPMT (Pre) 2012]**
(1) Maleic acid (2) α-amino acids (3) Lactic acid (4) Tartaric acid

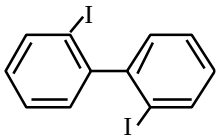
9. Two possible stereo-structures of **[AIPMT- 2015]**
$CH_3CHOH.COOH$, which are optically active, are called.
(1) Diastereomers (2) Atropisomers (3) Enantiomers (4) Mesomers

10. The correct statement regarding the comparison of staggered and eclipsed conformations of ethane, is: **[NEET-1 2016]**
(1) The staggered conformation of ethane is more stable than eclipsed conformation, because staggered conformation has no torsional strain.
(2) The staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain.
(3) The eclipsed conformation of ethane is more stable than staggered conformation, because eclipsed conformation has no torsional strain.
(4) The eclipsed conformation of ethane is more stable than staggered conformation even though the eclipsed conformation has torsional strain.

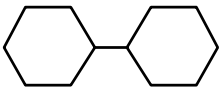
11. Which of the following biphenyls is optically active **[NEET-1 2016]**

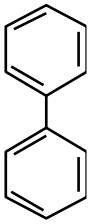
(1) 
(2) 

(3) 

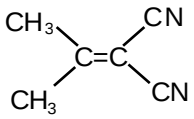
(4) 

12. In which of the following molecules, all atoms are coplanar ? **[NEET-2 2016]**

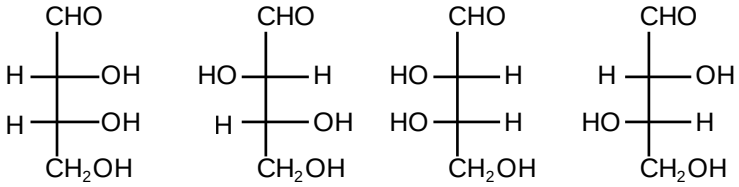
(1) 

(2) 

(3) 

(4) 

13. The correct corresponding order of names of four aldoses with configuration given below



[NEET-2 2016]

respectively, is

(1) D-erythrose, D-threose, L-erythrose, L-threose
(2) L-erythrose, L-threose, L-erythrose, D-threose
(3) D-threose, D-erythrose, L-threose, L-erythrose
(4) L-erythrose, L-threose, D-erythrose, D-threose

14. With respect to the conformers of ethane, which of the following statements is true? **[NEET- 2017]**

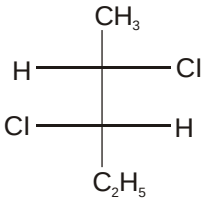
(1) Bond angle remains same but bond length changes
(2) Bond angle changes but bond length remains same
(3) Both bond angle and bond length changes
(4) Both bond angles and bond length remains same

PART - II : AIIMS QUESTION (PREVIOUS YEARS)

1. **Assertion :** Cis-1, 3-dihydroxy cyclohexane exists in boat conformation. **[AIIMS 2003]**
Reason : In the chair form, there will not be hydrogen bonding between the two hydroxyl groups.

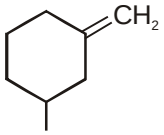
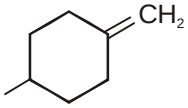
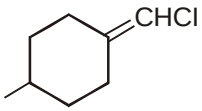
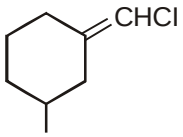
(1) If both assertion and reason are true and reason is a correct explanation of assertion.
(2) If both assertion and reason are true but reason is not a correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If both assertion and reason are false.
(5) If assertion is false but reason is true.

2. The absolute configuration of the following compound is : **[AIIMS-2003]**

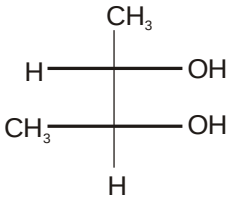


(1) 2S, 3R (2) 2S, 3S (3) 2R, 3S (4) 2R, 3R

3. The geometrical isomerism is shown by :- **[AIIMS-2004]**

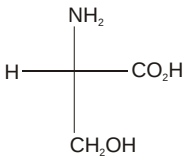
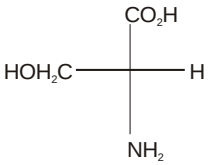
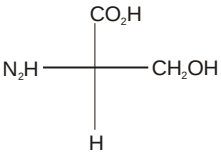
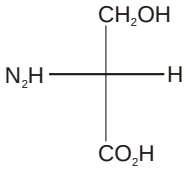
(1)  (2)  (3)  (4) 

4. Correct configuration of the following is : - **[AIIMS-2005]**

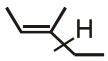
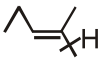


(1) 2S, 3S (2) 2S, 3R (3) 2R, 3S (4) 2R, 3R

5. Among the following L–serine is : - **[AIIMS-2006]**

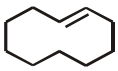
(1)  (2)  (3)  (4) 

6. C_8H_{16} that can form cis-trans geometrical isomers and also has a chiral centre, is **[AIIMS-2008]**

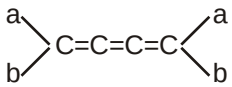
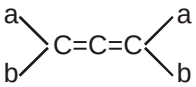
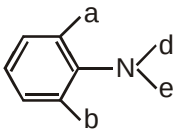
(1)  (2)  (3) Both of these (4) None of these

7. **Assertion :** Boiling points of cis-isomers are higher than trans-isomers generally. **[AIIMS-2008]**
Reason : Dipole moments of cis-isomers are higher than trans-isomers.
(1) If both assertion and reason are true and reason is a correct explanation of assertion.
(2) If both assertion and reason are true but reason is not a correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If both assertion and reason are false.
(5) If assertion is false but reason is true.

8. Which will not show geometrical isomerism ? **[AIIMS-2009]**

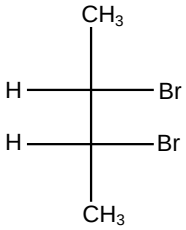
(1) $CH_3CH = NOH$ (2)  (3) HO – N = N – OH (4) $(CH_3)_2C = NOH$

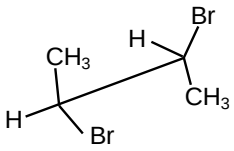
9. Which is optically inactive ? **[AIIMS-2010]**

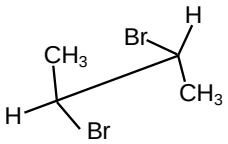
(1)  (2)  (3)  (4) None of these

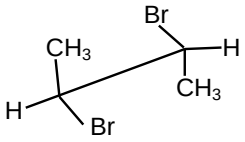
10. The compound CHCl = CHCHOHCOOH with molecular formula $C_4H_5O_3Cl$ can exhibit **[AIIMS-2014]**
(1) geometric, optical, position and functional isomerism.
(2) geometric. optical and functional isomerism only
(3) position and functional isomerism only
(4) geometric and optical isomerism only

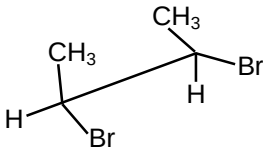
11. Point out incorrect sawhorse drawing(s) for the following compound. **[AIIMS-2015]**



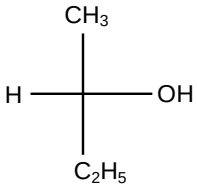
(1) 

(2) 

(3) 

(4) 

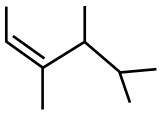
12. **Assertion (A)** : The following molecule is non-superimposable on its mirror image, hence it is chiral.



Reason (R) : All chiral molecules have chiral centers. **[AIIMS-2017]**

(1) If both assertion and reason are true and reason is a correct explanation of assertion.
(2) If both assertion and reason are true but reason is not a correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If both assertion and reason are false.
(5) If assertion is false but reason is true.

13. **Assertion (A)** : The configuration of is z. **[AIIMS-2017]**



Reason (R) : z-configuration shows the presence of bulkier groups at the opposite side of double bond.

(1) If both assertion and reason are true and reason is a correct explanation of assertion.

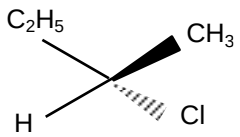
(2) If both assertion and reason are true but reason is not a correct explanation of assertion.

(3) If assertion is true but reason is false.

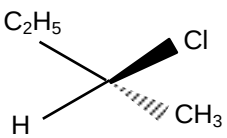
(4) If both assertion and reason are false.

(5) If assertion is false but reason is true.

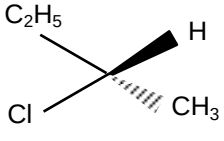
14. Which of the following are not enantiomer pair. **[AIIMS-2018]**



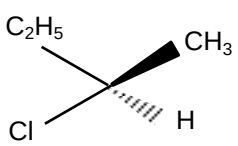
(A)



(B)



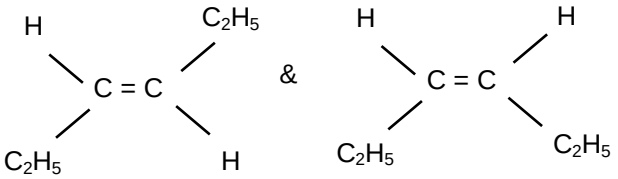
(C)



(D)

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

15. For geometric isomers of 3–hexene : **[AIIMS-2018]**



(1) M.P. is high and dipole moment high for trans

(2) M.P. is low and dipole moment low for trans

(3) M.P. is high and dipole moment low for trans

(4) M.P. is low and dipole moment high for trans

PART - III : JEE (MAIN) / AIEEE PROBLEMS (PREVIOUS YEARS)

1. Racemic mixture is formed by mixing two : **[AIEEE 2002]**

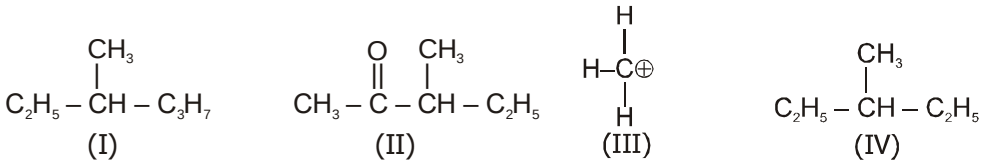
(1) Isomeric compounds (2) Chiral compounds (3) Meso compounds (4) Optical isomers

2. Which of the following does not show geometrical isomerism ? **[AIEEE 2002]**

(1) 1,2-Dichloro-1-pentene (2) 1,3-Dichloro-2-pentene

(3) 1,1-Dichloro-1-pentene (4) 1,4-Dichloro-2-pentene

3. Among the following four structures I to IV. **[AIEEE 2003]**



it is true that

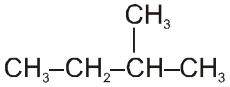
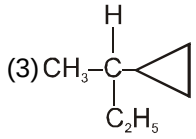
(1) All four are chiral compounds (2) Only I and II are chiral compounds

(3) Only III is a chiral compound (4) Only II and IV are chiral compounds

4. Which of the following will have a meso-isomer also ? **[AIEEE 2004]**

(1) 2-Chlorobutane (2) 2,3-Dichlorobutane (3) 2,3-Dichloropentane (4) 2-Hydroxypropanoic acid

5. Amongst the following compounds, the optically acitve alkane having lowest molecular mass is **[AIEEE 2004]**

(1) $CH_3–CH_2–CH_2–CH_3$ (2)  (3)  (4) $CH_3–CH_2–C\equiv CH$

6. Which of the following compounds is not chiral ? **[AIEEE 2004]**

(1) 1–Chloropentane (2) 2-Chloropentane

(3) 1-Chloro-2-methylpentane (4) 3-Chloro-2-methylpentane

7. Which type of isomerism is shown by 2,3-dichlorobutane ? **[AIEEE 2005]**

(1) diastereomerism (2) optical-isomerism

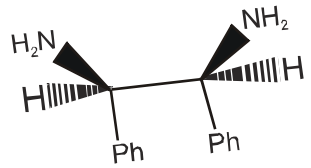
(3) geometric-isomerism (4) structural-isomerism

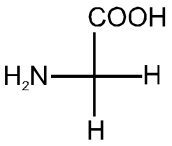
8. Increasing order of stability among the three main conformations (i.e. eclipse, anti, gauche) of 2-fluoroethanol is **[AIEEE- 2006]**

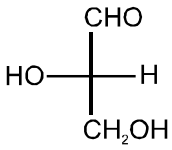
(1) eclipse, gauche, anti (2) gauche, eclipse, anti

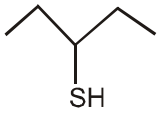
(3) eclipse, anti, gauche (4) anti, gauche, esclipse

9. Which of the following molecules is expected to rotate the plane of polarized light? **[AIEEE 2007, 3/120]**

(1) 

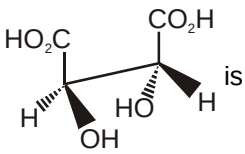
(2) 

(3) 

(4) 

10. Which one of the following conformations of cyclohexane is chiral? **[AIEEE-2007, 3/120]**

(1) Chair (2) Boat (3) Twist boat (4) Rigid

11. The absolute configuration of 

is **[AIEEE 2008, 3/105]**

(1) R, R (2) R, S (3) S, R (4) S, S

12. The alkene that exhibits geometrical isomerism is : **[AIEEE 2009, 4/144]**

(1) 2-methyl propene (2) 2-butene (3) 2-methyl-2-butene (4) propene

13. The number of stereoisomers possible for a compound of the molecular formula CH_3–CH=CH–CH(OH)–Me is: **[AIEEE 2009, 4/144]**

(1) 2 (2) 4 (3) 6 (4) 3

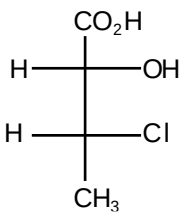
14. Out of the following, the alkene that exhibits optical isomerism is. **[AIEEE 2010, 4/144]**

(1) 3-methyl-2pentene (2) 4-methyl-1-pentene (3) 3-methyl-1-pentene (4) 2-methyl-2-pentene

15. Which of the following compound will exhibit geometrical isomerism ? **[AIEEE 2015, 4/120]**

(1) 1-Phenyl-2-butene (2) 3-Phenyl-1-butene

(3) 2-Phenyl-1-butene (4) 1,1-Diphenyl-1-propane

16. The absolute configuration of 

is **[AIEEE 2016]**

(1) (2S, 3R) (2) (2S, 3S) (3) (2R, 3R) (4) (2R, 3S)

Answers

EXERCISE - 1

SECTION (A)

1.	(3)	**2.**	(4)	**3.**	(4)	**4.**	(4)	**5.**	(1)	**6.**	(4)	**7.**	(4)
8.	(1)	**9.**	(4)	**10.**	(4)	**11.**	(2)						

SECTION (B)

1.	(1)	**2.**	(4)	**3.**	(4)	**4.**	(4)	**5.**	(3)	**6.**	(4)	**7.**	(4)
8.	(3)	**9.**	(3)										

SECTION (C)

1.	(2)	**2.**	(2)	**3.**	(3)	**4.**	(1)	**5.**	(3)	**6.**	(3)		

SECTION (D)

1.	(3)	**2.**	(4)	**3.**	(2)	**4.**	(1)	**5.**	(1)	**6.**	(1)	**7.**	(1)
8.	(4)	**9.**	(4)										

SECTION (E)

1.	(4)	**2.**	(3)	**3.**	(1)								

SECTION (F)

1.	(4)	**2.**	(4)	**3.**	(1)	**4.**	(4)	**5.**	(1)	**6.**	(2)		

SECTION (G)

1.	(4)	**2.**	(2)	**3.**	(3)	**4.**	(1)	**5.**	(4)				

SECTION (H)

1.	(4)	**2.**	(1)	**3.**	(4)	**4.**	(3)						

SECTION (I)

1.	(1)	**2.**	(3)	**3.**	(2)	**4.**	(3)	**5.**	(1)	**6.**	(4)		

SECTION (J)

1.	(3)	**2.**	(2)	**3.**	(3)	**4.**	(4)						

SECTION (K)

1.	(4)	**2.**	(1)	**3.**	(1)								

SECTION (L)

1.	(2)	**2.**	(2)	**3.**	(2)	**4.**	(2)	**5.**	(2)	**6.**	(2)	**7.**	(3)
8.	(2)	**9.**	(2)	**10.**	(3)	**11.**	(2)	**12.**	(2)				

EXERCISE - 2

1.	(4)	**2.**	(4)	**3.**	(3)	**4.**	(3)	**5.**	(4)	**6.**	(3)	**7.**	(3)
8.	(4)	**9.**	(1)	**10.**	(2)	**11.**	(2)	**12.**	(2)	**13.**	(4)	**14.**	(3)
15.	(3)	**16.**	(1)	**17.**	(4)	**18.**	(3)	**19.**	(1)	**20.**	(2)	**21.**	(2)
22.	(2)	**23.**	(2)	**24.**	(1)								

EXERCISE - 3

PART-I

1.	(1)	**2.**	(2)	**3.**	(3)	**4.**	(3)	**5.**	(2)	**6.**	(2)	**7.**	(1)
8.	(1)	**9.**	(3)	**10.**	(1)	**11.**	(3)	**12.**	(2)	**13.**	(1)	**14.**	(4)

PART-II

1.	(4)	**2.**	(2)	**3.**	(4)	**4.**	(1)	**5.**	(1)	**6.**	(1)	**7.**	(1)
8.	(4)	**9.**	(1)	**10.**	(1)	**11.**	(1)	**12.**	(3)	**13.**	(3)	**14.**	(1)
15.	(3)												

PART-III

1.	(4)	**2.**	(3)	**3.**	(2)	**4.**	(2)	**5.**	(3)	**6.**	(1)	**7.**	(2)
8.	(3)	**9.**	(3)	**10.**	(3)	**11.**	(1)	**12.**	(2)	**13.**	(2)	**14.**	(3)
15.	(1)	**16.**	(1)										