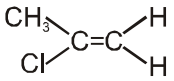
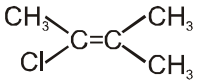
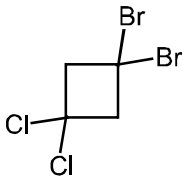
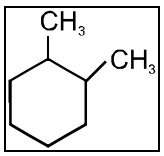
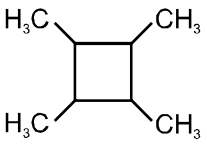
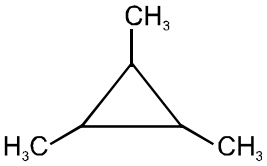
DPP-1 : Geometrical isomerism

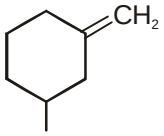
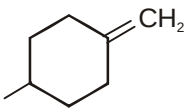
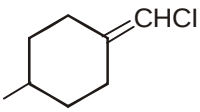
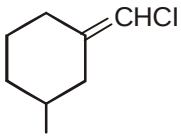
1. Stereoisomers have different : .
(1) Molecular formula (2) Structural formula (3) Configuration (4) Molecular mass

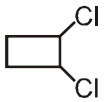
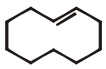
2. Which can show the cis-trans isomerism :
(1) $ClCH_2CH_2Cl$ (2) $Cl_2C{=}{=}CH_2$ (3) $Cl_2C{=}{=}CCl_2$ (4) ClCH ==CHCl

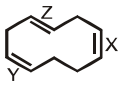
3. Which of the following compounds will not show geometrical isomerism :
(1) Cyclooctene (2) 1-Bromo-2-chloroethene
(3) 1-Phenylpropene (4) 2-Methyl-2-butene

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) 

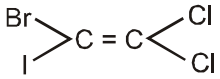
7. Which of the following will from geometrical isomers :
(1)  (2) $CH_3CH{=}NOH$ (3)  (4) All of these

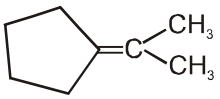
8. Types of geometrical isomerism shown at point X, Y and Z of the following compound respectively are


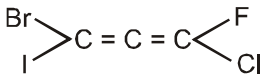
	X	Y	Z
(1)	cis	cis	trans
(2)	cis	trans	trans
(3)	trans	cis	cis
(4)	cis	trans	cis

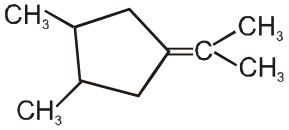
9. Which of the following compounds does not have geometrical isomers :
(1) 2-Pentenoic acid (2) 2-Butenoic acid (3) 3-Pentenoic acid (4) 3-Butenoic acid

10. Which of the following compound can show geometrical isomerism

(1) 

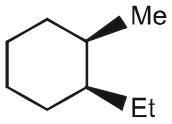
(2) 

(3) 

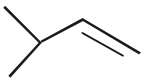
(4) 

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

(1) 

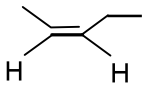
(2) 

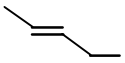
(3) 

(4) 

DPP-2: CIP Rules (E/Z Naming) & Physical Properties of G.I

1. Identify (Z) - 2 - pentene :

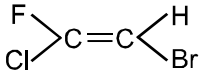
(1) 

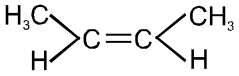
(2) 

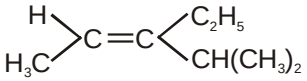
(3) 

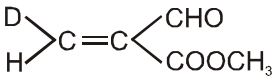
(4) 

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

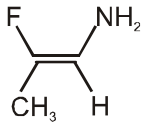
(1) 

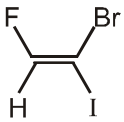
(2) 

(3) 

(4) 

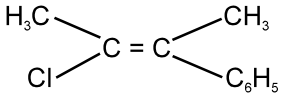
3. Determine the double bond stereochemistry (E or Z) for the following molecules

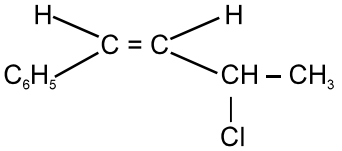


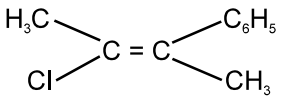


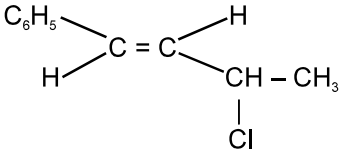
(1) A : E ; B : E (2) A : Z ; B : Z (3) A : E ; B : Z (4) A : Z ; B : E

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

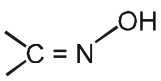
(1) 

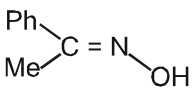
(2) 

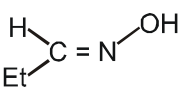
(3) 

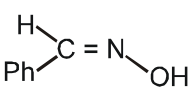
(4) 

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

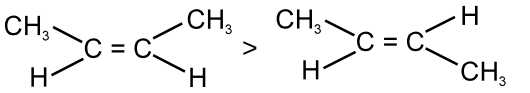
(1) 

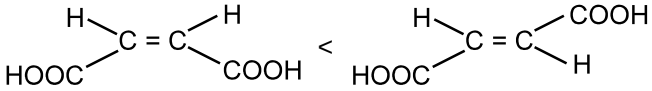
(2) 

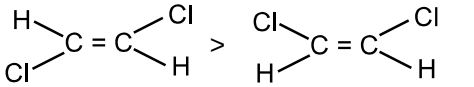
(3) 

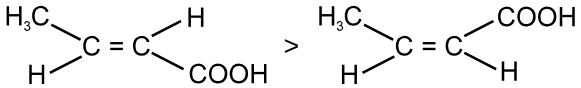
(4) 

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

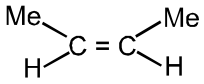
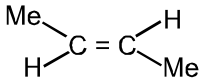
(1)  (Melting point)

(2)  (Dipole moment)

(3)  (Boiling point)

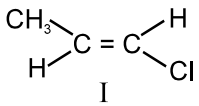
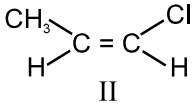
(4)  (Water solubility)

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

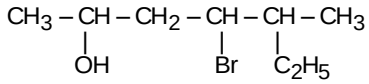
DPP-3 : Chiral carbon and Projection Formula

1. Chiral molecules are :

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

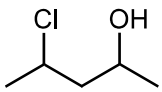
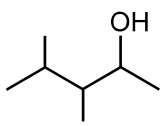
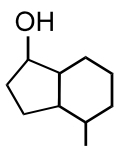
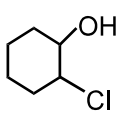
(3) unstable molecules (4) capable of showing geometrical isomerism

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

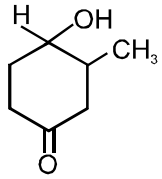


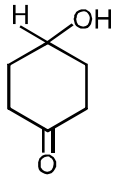
(1) 2 (2) 3 (3) 4 (4) 5

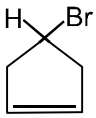
3. The compound which has maximum number of chiral centres is

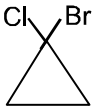
(1)  (2)  (3)  (4) 

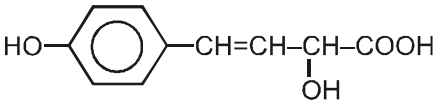
4. Which of the following compounds possesses a chiral centre :

(1) 

(2) 

(3) 

(4) 

5. 

will shows

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

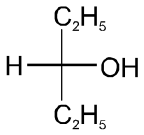
(3) Geometrical and optical isomerism (4) Neither geometrical nor optical isomerism

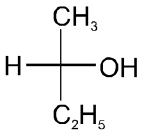
6. Which of the following have chiral carbon ?

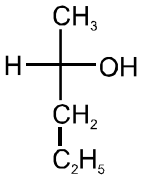
(1) 1–Butanol (2) 1–Propanol (3) 2–Chlorobutane (4) 4–Hydroxyheptane

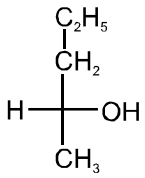
DPP-4 : R/S & D/L Naming.

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

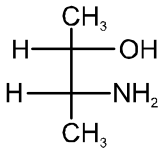
(1) 

(2) 

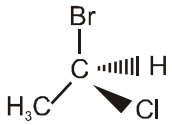
(3) 

(4) 

2. The correct configuration assigned for given compound :

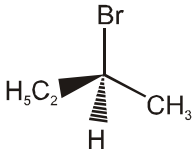


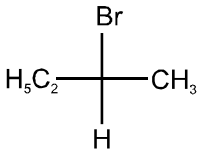
(1) 2R, 3R (2) 2S, 3S (3) 2R, 3S (4) 2S, 3R

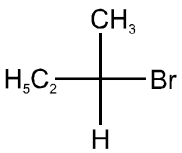
3. The configuration of the given compound is : 

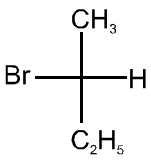
(1) E (2) R (3) S (4) Z

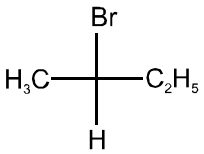
4. Which Fisher projection represents the given wedge dash structure :

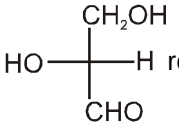


(1) 

(2) 

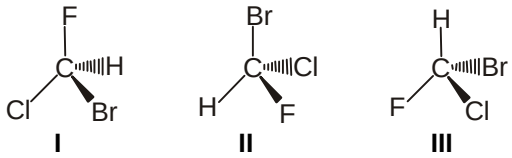
(3) 

(4) 

5.  represents the Fischer projection formula :

(1) D (2) L (3) d (4) ℓ

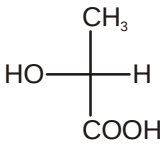
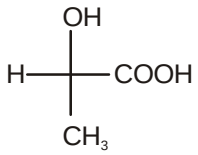
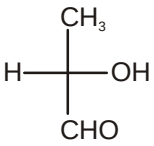
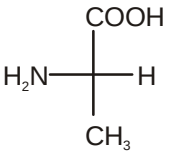
6. Which of the following have same configuration.



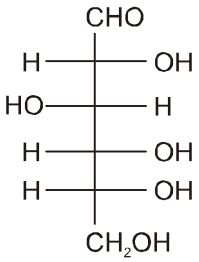
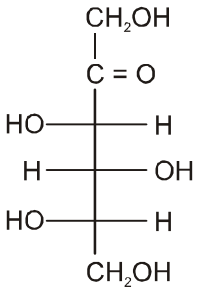
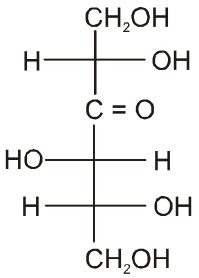
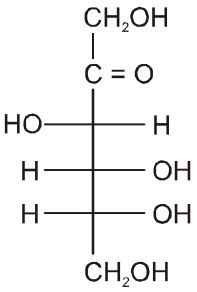
I **II** **III**

(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

DPP-5 : Element of Symmetries (POS, COS)

1. Which statement is wrong about symmetry ?

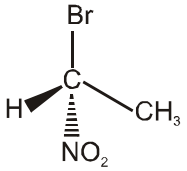
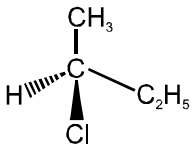
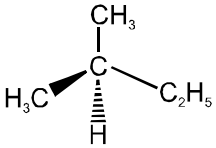
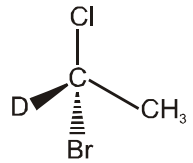
(1) Plane of symmetry is an imaginary plane which bisects the molecule in two equal halves in such a way that each half of the molecule is the mirror image of the other half.

(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.

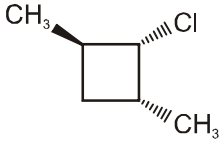
(4) A molecule which does not possess any element of symmetry is called symmetric molecule.

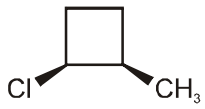
2. Which of the following compound posses plane of symmetry ?

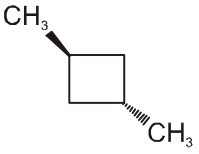
(1)  (2)  (3)  (4) 

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

DPP-6 : Definition and Properties of Enantiomers, Diastereomers, Meso compounds

1. Which of the following statements is not correct :

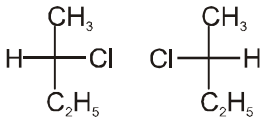
(1) Enantiomers are Eessentially chiral and optically active

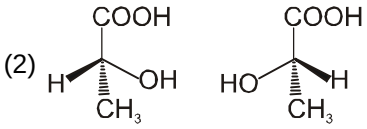
(2) Diastereomers are not neccesarily chiral and optically active

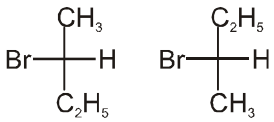
(3) All geometrical isomers are diastereomers

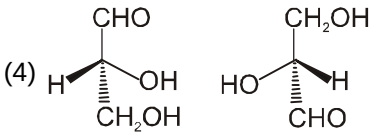
(4) All diastereomers are chiral and optically active

2. Which is not the pair of enantiomers ?

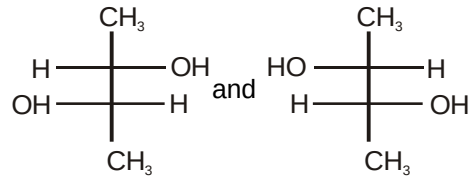
(1) 

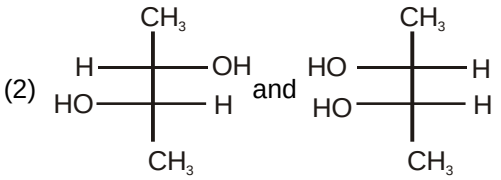
(2) 

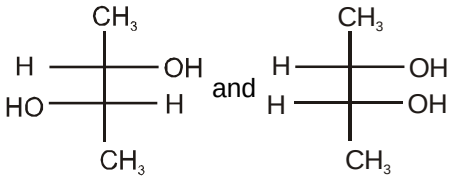
(3) 

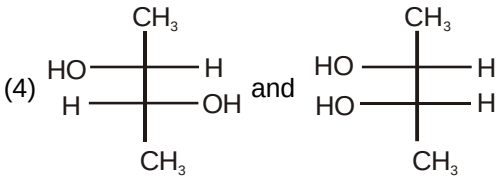
(4) 

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

(1) 

(2) 

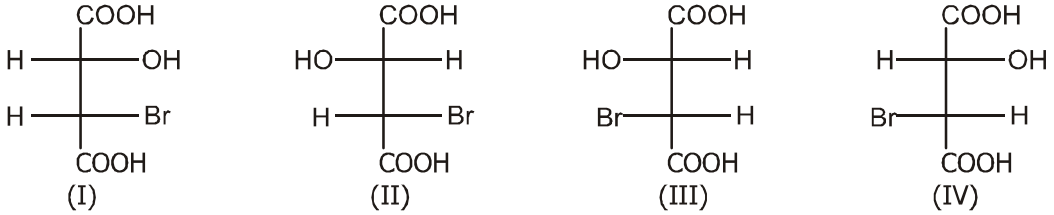
(3) 

(4) 

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

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

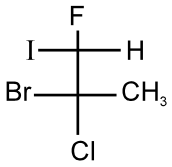
5. Which one among the following is not diastereomeric pair.



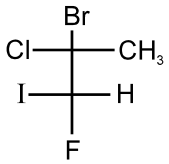
(I) (II) (III) (IV)

(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)

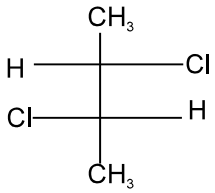


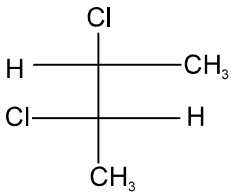
(II)

(1) Enantiomer (2) Diastereomers
(3) Constitutional isomer (4) Identical molecules

DPP-7 : 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

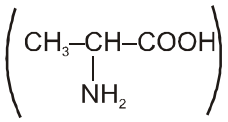
2. If optical rotation produced by 

is + 36º then that produced by 

is

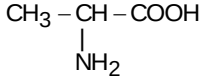
(1) –36º (2) 0º (3) +36º (4) unpredictable

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) 

and $H_2N–CH_2–CH_2–COOH$ (4) (+)-lactic acid and (–)-lactic acid

DPP-8 : 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.

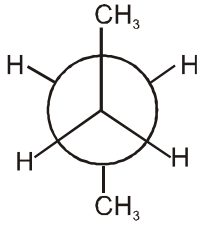
2. The eclipsed and staggered conformation of ethane is due to –
(1) Free rotation about C–C single bond (2) Restricted rotation about C–C single bond
(3) Absence of rotation about C–C bond (4) None of the above

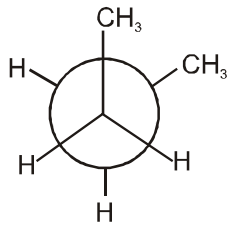
3. The Baeyer's angle strain is expected to be maximum in
(1) Cyclodecane (2) Cyclopentane (3) Cyclobutane (4) Cyclopropane

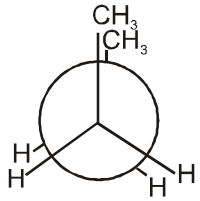
4. The minimum torsional strain developed in butane is at dihedral angle(s)
(1) 0º, 108º (2) 120°, 240º (3) 60°, 180°, 300° (4) 60°, 120°, 180°

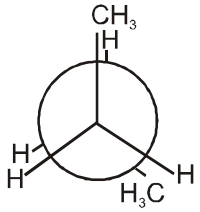
DPP-9 : Conformational analysis of Ethane, Propane, Butane and Substituted butane

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

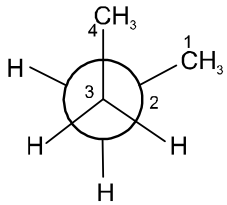
(1) 

(2) 

(3) 

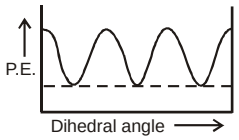
(4) 

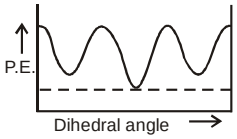
2. Newman projection of Butane is given,C-2 is rotated by 120º along C_2-C_3 bond in anticlockwise direction the conformation formed is :

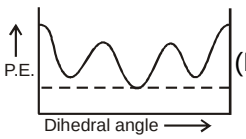


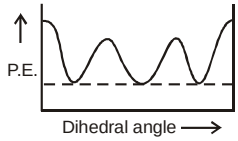
(1) anti (2) fully eclipsed (3) gauche (4) partially eclipsed

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

(I) 

(II) 

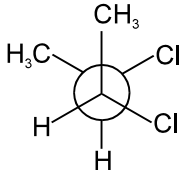
(III) 

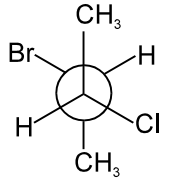
(IV) 

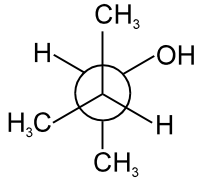
(1) I & II (2) I & III (3) II & IV (4) IV & II

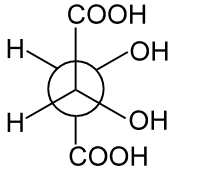
4. The dipole moment of 1, 2-Dichloroethane is 1.12 D. Which statement is correct about this compound.
(1) It exists mainly in fully eclipsed conformation.
(2) It exists only in anti conformation.
(3) The polarity is due to gauche (skew) conformation.
(4) The anti conformation has highest dipole moment.

5. Which of the following is an achiral molecule?

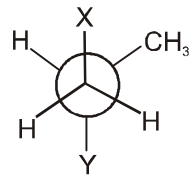
(1) 

(2) 

(3) 

(4) 

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



X,Y respectively can be :

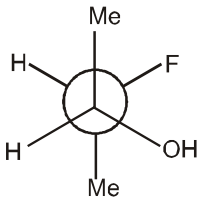
(1) $-CH(CH_3)_2$ and H (2) $-CH_3$ and $-C_2H_5$ (3) $-C_2H_5$ and $-CH_3$ (4) H and $-CH(CH_3)_2$

DPP-10 : 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 :



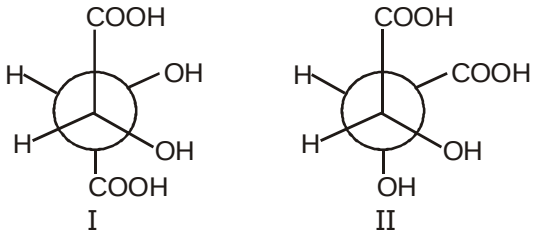
(1) It has maximum angle strain.

(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.

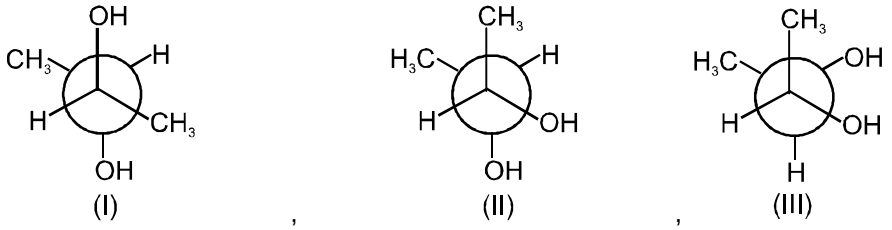
3. The structures I and II are



(1) Conformational diastereomers (2) Configurational enantiomers

(3) Configurational diastereomers (4) Identical

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



(1) I & II are diastereomers (2) I & III are identical

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

DPP-11 : 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°

DPP-12 : Counting of stereoisomers

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

Ph – CH = CH – CH = CH – COOH

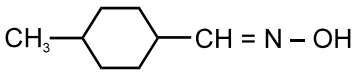
(1) 3 (2) 4 (3) 2 (4) 1

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

CH_3 – CH = CH – CH = CH – CH = CH_2

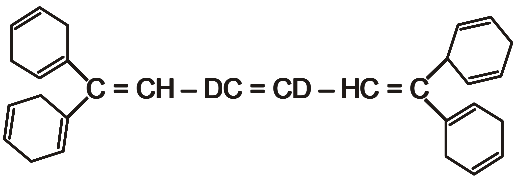
(1) 2 (2) 4 (3) 6 (4) 8

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



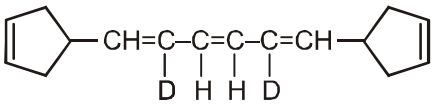
(1) 2 (2) 4 (3) 6 (4) 8

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



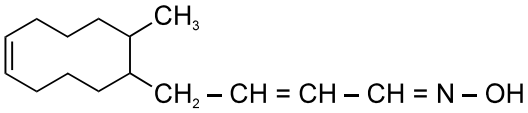
(1) 2 (2) 4 (3) 6 (4) 8

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 :



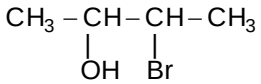
(1) 8 (2) 16 (3) 32 (4) 10

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.

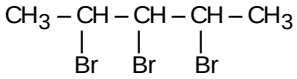
(3) All isomers have 5σ bonds and one π bond. (4) Its has linear shape.

8. Total number of stereoisomers of compound is :



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

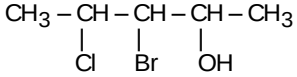
9.



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

Answers

DPP-1

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

DPP-2

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

DPP-3

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

DPP-4

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

DPP-5

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

DPP-6

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

DPP-7

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

DPP-8

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

DPP-9

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

DPP-10

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

DPP-11

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

DPP-12

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