PRE-MEDICAL

ORGANIC CHEMISTRY

ENTHUSIAST | LEADER | ACHIEVER

EXERCISE

Isomerism

ENGLISH MEDIUM

EXERCISE-I (Conceptual Questions) — Build Up Your Understanding

STRUCTURAL ISOMERISM

1. $CH_3CHOHCH_2CHO$ and $CH_3CH_2CH_2COOH$ constitute a pair of :-
(1) Position isomers (2) Metamers
(3) Optical isomers (4) Functional isomers
SR0001

2. The minimum number of carbon atoms present in an organic compound to show chain isomerism is
(1) 2 (2) 3 (3) 5 (4) 4
SR0002

3. $CH_3–NH–C_2H_5$ and $(CH_3)_3N$ show which type of isomerism :-
(1) Position (2) Functional
(3) Chain (4) None
SR0005

4. $CH_3–\underset{\underset{Cl}{|}}{CH}–CH_2–\underset{\underset{H}{|}}{C}=O$ and $CH_3–CH_2–CH_2–\underset{\underset{O}{||}}{C}–Cl$
are constitute a pair of :-
(1) Position isomers
(2) Metamers
(3) Optical isomers
(4) Functional group isomers
SR0006

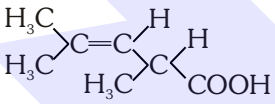
5. Which are metamers :-
(1) $CH_3–O–CH_2CH_2CH_3$, $CH_3–CH_2–O–CH_2–CH_3$
(2) $C_2H_5–O–C_2H_5$, $CH_3CH_2CH_2CH_2OH$
(3) $CH_3–O–C_2H_5$, $CH_3–CH_2–O–CH_3$
(4) $CH_3–\underset{\underset{O}{||}}{C}–CH_3$, $CH_3–CH_2–\underset{\underset{O}{||}}{C}–H$
SR0008

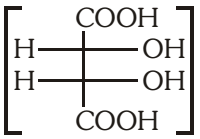
6. Which similarity is necessary for isomerism–
(1) Molecular formula
(2) Structure formula
(3) Physical formula
(4) Chemical formula
SR0009

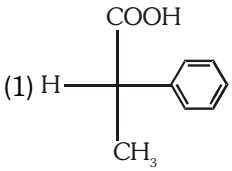
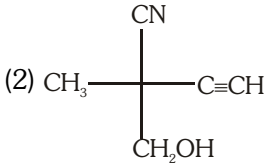
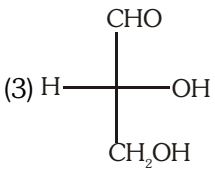
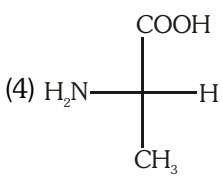
7. $HC\equiv C–CH_2–\underset{\underset{CH_3}{|}}{CH}–CH_3$ & $CH_3–C\equiv C–\underset{\underset{CH_3}{|}}{CH}–CH_3$
are
(1) Chain isomer (2) Homologous
(3) Position isomer (4) None
SR0093

8. How many structural isomer are possible for C_5H_8 having one triple bond ?
(1) 4 (2) 3 (3) 5 (4) 1
SR0094

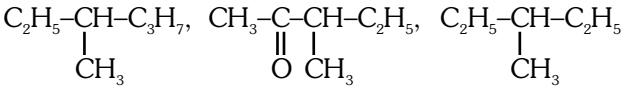
GEOMETRICAL AND OPTICAL ISOMERISM

9.  Exhibits :-
(1) Tautomerism
(2) Optical isomerism
(3) Geometrical isomerism
(4) Geometrical and optical isomerism
SE0011

10. Meso–tartaric acid  is optically inactive due to the presence of :-
(1) Molecular symmetry
(2) Molecular asymmetry
(3) External compensation
(4) Two asymmetric carbon atoms
SE0019

11. Identify R configuration :
(1) 
(2) 
(3) 
(4) 
SE0023

12. Among the following structure I to III

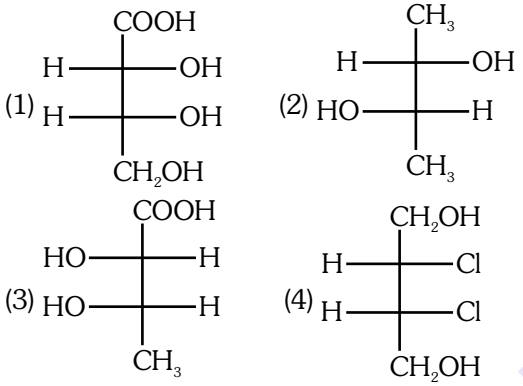


(I) (II) (III)

It is true that :-
(1) All three are chiral compounds
(2) Only I and II are chiral compounds
(3) Only II is chiral compound
(4) Only I and III are chiral compounds

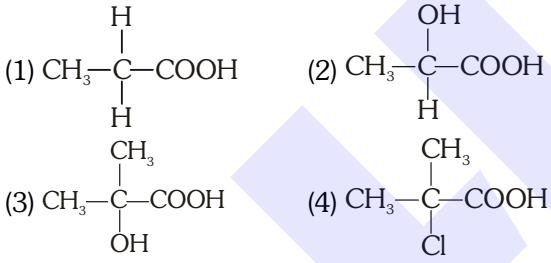
SE0026

13. Which one of the following is a meso–compound.



SE0028

14. Which compound is optical active –



SE0032

CONFORMATIONAL ISOMERISM

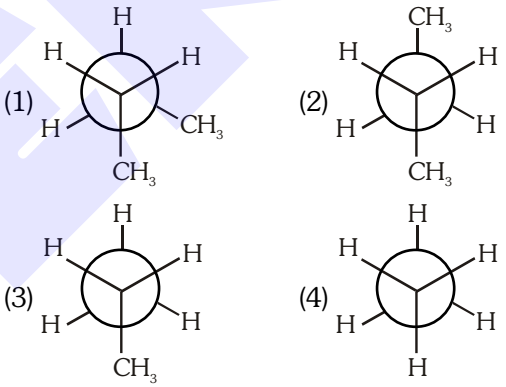
15. Which conformation of butane will have the minimum energy :-
(1) Gauche
(2) Anti/staggered
(3) Eclipsed
(4) None

SE0035

16. Which of the following are true statements.
(a) Alkanes have infinite no. of conformation
(b) The rotation is hindered due to repulsive interaction between electron clouds, called torsional strain
(c) The barrier is about 50 kJ/mole
(d) The barrier is about 1-20 kJ/mole
(1) a, b, d (2) a, b, c
(3) only b (4) only a, d

SE0095

17. Which of the following has minimum steric strain?



SE0096

EXERCISE-I (Conceptual Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	4	4	2	4	1	1	3	2	2	1	3	2	4	2	2
Que.	16	17													
Ans.	1	4													

EXERCISE-II (Previous Year Questions) AIPMT/NEET

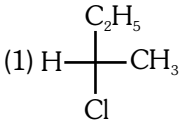
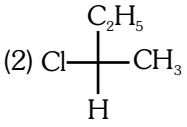
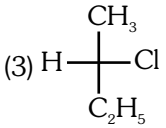
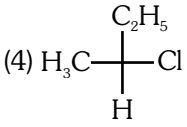
AIPMT-2006

1. Which of the following is not chiral :-
(1) 2–Butanol
(2) 2,3–Dibromo pentane
(3) 3–Bromo pentane
(4) 2–Hydroxy propanoic acid

SE0036

AIPMT-2007

2. $CH_3—CHCl—CH_2—CH_3$ has a chiral centre which one of the following represents its R configuration

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

SE0039

AIPMT-2008

3. How many stereoisomer does this molecule have $CH_3CH=CHCH_2CHBrCH_3$
(1) 8 (2) 2 (3) 4 (4) 6

SE0040

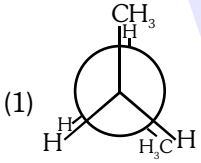
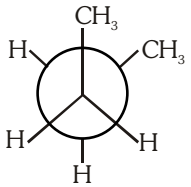
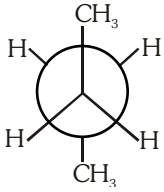
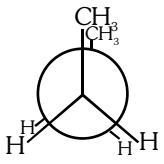
AIPMT-2009

4. Which of the following compounds will exhibit cis-trans (geometrical) isomerism ?
(1) 1-Butanol (2) 2-Butene
(3) 2-Butanol (4) 2-Butyne

SE0041

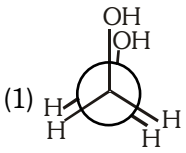
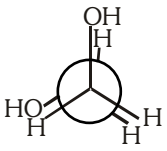
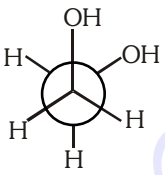
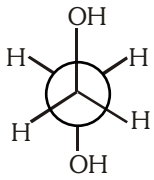
AIPMT-2010

5. In the following the most stable conformation of n–butane is :-

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

SE0042

6. Which of the following conformers for ethylene glycol is most stable :-

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

SE0043

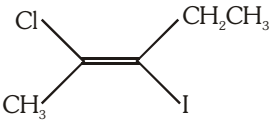
AIPMT Pre.-2012

7. Which of the following acids does not exhibit optical isomerism?
(1) Lactic acid
(2) Tartaric acid
(3) Maleic acid
(4) α-amino acids

SE0046

AIPMT Mains-2011

8. The IUPAC name of the following compound



is :-

(1) cis-2-chloro-3-iodo-2-pentene
(2) trans-2-chloro-3-iodo-2-pentene
(3) cis-3-iodo-4-chloro-3-pentene
(4) trans-3-iodo-4-chloro-3-pentene

SE0047

Re-AIPMT-2015

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

SE0048

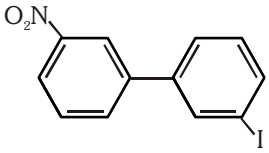
10. The number of structural isomers possible from the molecular formula C_3H_9N is :

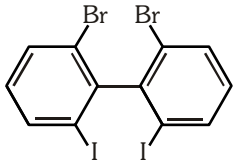
(1) 2 (2) 3 (3) 4 (4) 5

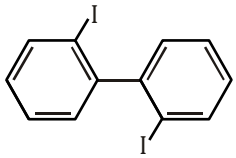
NC0049

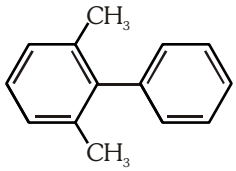
NEET-I 2016

11. Which of the following biphenyls is optically active?

(1) 

(2) 

(3) 

(4) 

SE0050

12. The **correct** statement regarding the comparison of staggered and eclipsed conformation of ethane, is :-

(1) The staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain

(2) The eclipsed conformation of ethane is more stable than staggered conformation, because eclipsed conformation has no torsional strain

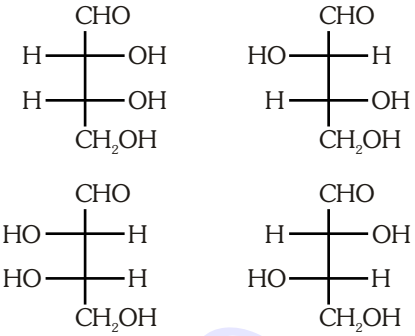
(3) The eclipsed conformation of ethane is more stable than staggered conformation even through the eclipsed conformation has torsional strain

(4) The staggered conformation of ethane is more stable than eclipsed conformation, because staggered conformation has no torsional strain.

SE0051

NEET-II 2016

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



respectively, is :-

(1) L-erythrose, L-threose, D-erythrose, D-threose

(2) D-erythrose, D-threose, L-erythrose, L-threose

(3) L-erythrose, L-threose, L-erythrose, D-threose

(4) D-threose, D-erythrose, L-threose, L-erythrose

SE0052

NEET(UG) 2017

14. With respect to the conformers of ethane, which of the following statements is **true** ?

(1) Bond angle changes but bond length remains same

(2) Both bond angle and bond length change

(3) Both bond angles and bond length remains same

(4) Bond angle remains same but bond length changes

SE0056

NEET(UG) 2021

15. Dihedral angle of least stable conformer of ethane is :

(1) 120° (2) 180°

(3) 60° (4) 0°

SE0109

16. The compound which shows metamerism is:

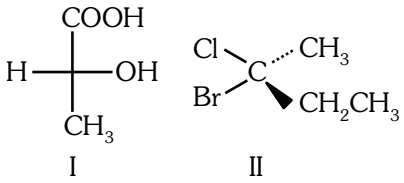
(1) C_5H_{12} (2) C_3H_8O

(3) C_3H_6O (4) $C_4H_{10}O$

SR0110

NEET(UG) 2021 (Paper-2)

17. The correct configuration assigned for compounds (I) and (II) respectively is



I II

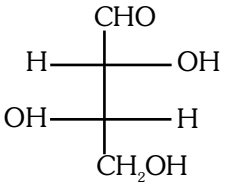
(1) R, R (2) S, S

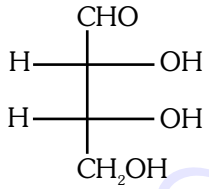
(3) R, S (4) S, R

SE0115

NEET(UG) 2022 (OVERSEAS)

18. Which one is not a D-sugar ?

(1)


(2)


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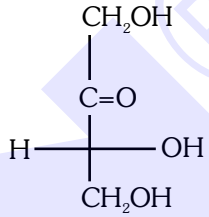
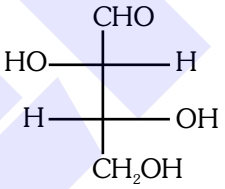


(4)


SE0116

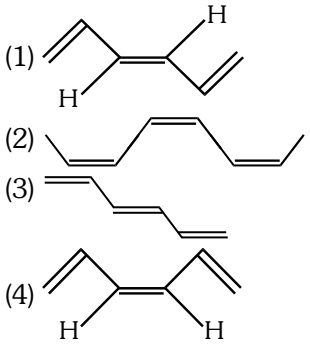
EXERCISE-II (Previous Year Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**	**1**	**3**	**2**	**4**	**2**	**3**	**4**
Que.	16	17	18												
Ans.	**4**	**1**	**1**												

EXERCISE-III (Analytical Questions) — Master Your Understanding

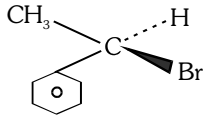
1. Which of the following does not contain any asymmetric carbon but can show enantiomerism:-
(1) Lactic acid (2) 1, 3-pentadiene
(3) Tartaric acid (4) 2, 3-pentadiene
SE0063

2. Which of the following represents the structure having cis arrangement around each double bond :-



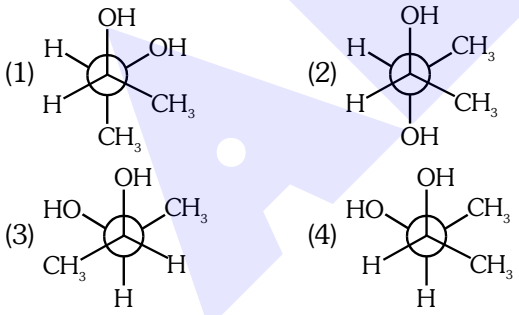
SE0064

3. The complete IUPAC name of the compound :-



(1) (R)-1-Bromo-1-phenyl ethane
(2) (S)-1-Bromo-1-phenyl ethane
(3) (E)-1-Bromo-1-phenyl ethane
(4) (Z)-1-Bromo-1-phenyl ethane
SE0066

4. Which one of the following is the most stable conformation of 2, 3–butanediol :-

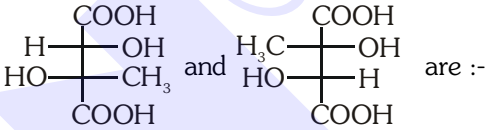


SE0067

5. How many isomers of $C_5H_{11}OH$ will be primary alcohols (exclude stereoisomers) :–
(1) 2 (2) 3 (3) 4 (4) 6
NC0069

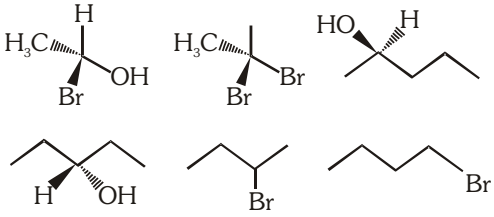
6. The minimum number of carbon atoms in ketone to show metamerism :–
(1) 3 (2) 4 (3) 5 (4) 6
SR0070

7. The total number of configurational isomers of the given compound are :-
$CH_3–CH=CHCHOHCHOHCH_3$
(1) 2 (2) 4 (3) 6 (4) 8
SE0073

8.  are :-
(1) Enantiomers (2) Position isomers
(3) Geometrical isomers (4) Homomers
SE0075

9. Which of the following is not a metamer of $C_4H_{10}O$
(1) Diethyl ether
(2) Methyl n-propyl ether
(3) 2–Methoxy propane
(4) Isobutyl alcohol
SE0076

10. How many compounds among the following are chiral ?



(1) 1 (2) 2
(3) 3 (4) 4
SE0097

EXERCISE-III (Analytical Questions) — ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	4	2	1	3	3	3	4	4	4	3