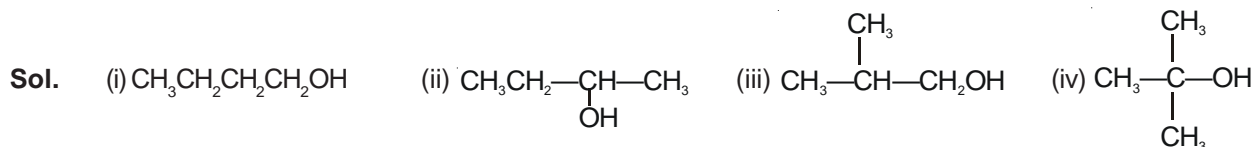
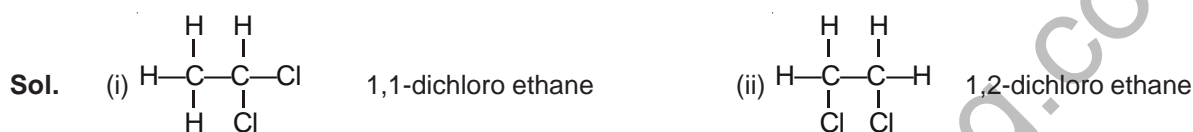


Solved Example

- Q.1** Total number of isomeric alcohols with formula $C_4H_{10}O$ are -
 [1] 1 [2] 2 [3] 3 [4] 4

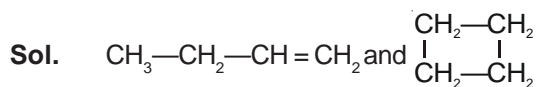


- Q.2** The molecular formula of a saturated compound is $C_2H_4Cl_2$. The formula permits the existence of two -
 [1] functional isomers [2] Position isomers [3] Optical isomers [4] Cis-trans isomers

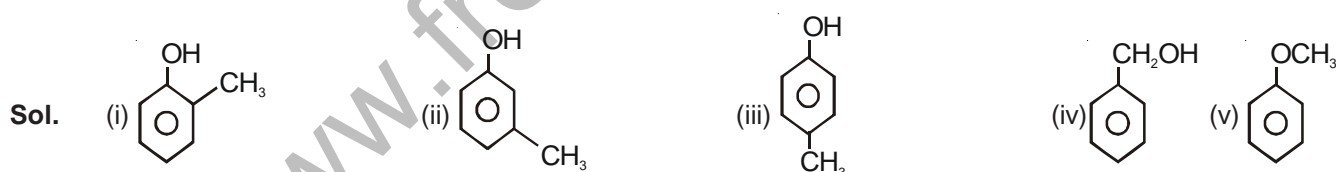


Both are position isomers

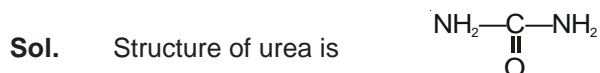
- Q.3** But-1-ene and cyclobutane exhibit -
 [1] Chain isomerism [2] Position isomerism [3] Tautomerism [4] Functional isomerism



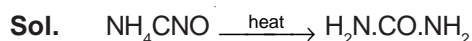
- Q.4** C_7H_8O show how many isomers -
 [1] 2 [2] 3 [3] 4 [4] 5



- Q.5** The type of isomerism found in urea molecule is -
 [1] Chain [2] Position [3] Tautomerism [4] None of these

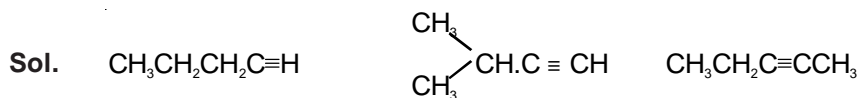


- Q.6** On evaporation of an aqueous solution of ammonium cyanate we get urea. This is class of reaction known as -
 [1] Polymerization [2] Isomerizations [3] Association [4] Dissociation



Note that nothing is added or eliminated only rearrangement among atoms is observed.

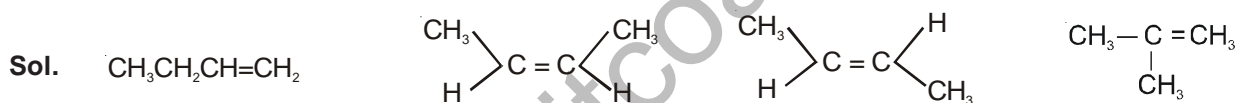
- Q.7** The possible number of alkynes with the formula C_5H_8 is -
 [1] 2 [2] 3 [3] 4 [4] 5



- Q.8** How many isomers of $C_5H_{11}OH$ will be primary alcohols -
 [1] 2 [2] 3 [3] 4 [4] 5



- Q.9** The maximum number of acyclic isomers for an alkene with molecular formula C_4H_8 is -
 [1] 2 [2] 3 [3] 4 [4] 5



- Q.10** Which is not found in alkenes -
 [1] Chain isomerism [2] Geometrical isomerism
 [3] Metamerism [4] Position isomerism

Sol. Metamerism is observed when there is change in alkyl group.

- Q.11** Keto - enol tautomerism is observed in -



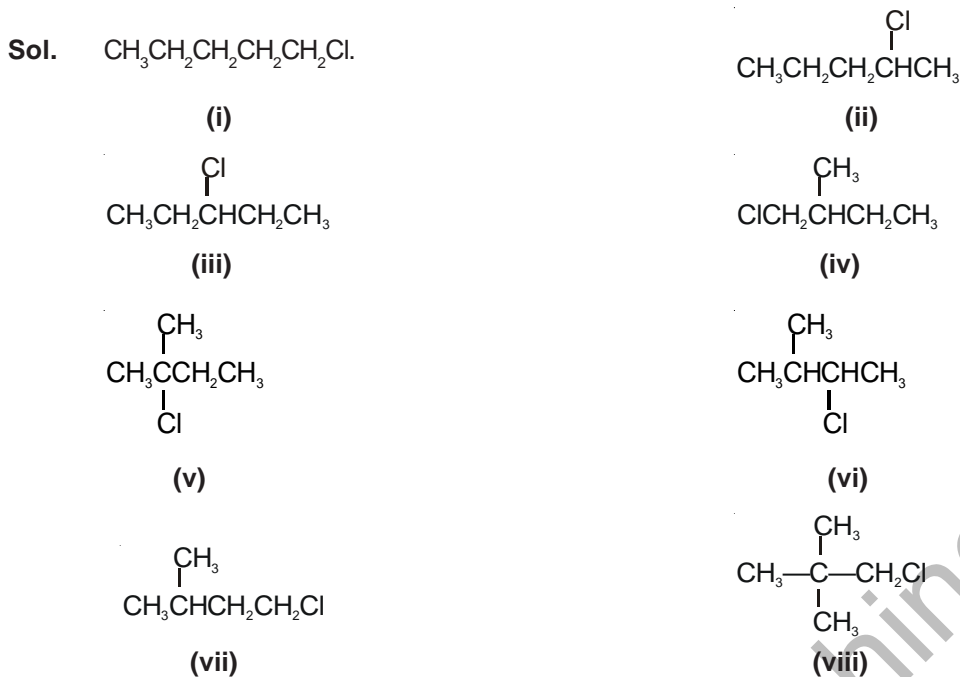
Sol. The compound must contain α hydrogen atom for showing keto enol tautomerism.

- Q.12** An alkane can show structural isomerism if it has number of minimum carbon atoms -
 [1] 1 [2] 2 [3] 3 [4] 4

Sol. $CH_4, CH_3-CH_3, CH_3-CH_2-CH_3$ exist only in one structural form, while $CH_3CH_2CH_2CH_3$ can exist in more than one structural form.

ISOMERISM

- Q.13** How many structural formula are possible for $C_5H_{11}Cl$ is :-
 [1] 6 [2] 8 [3] 10 [4] 12

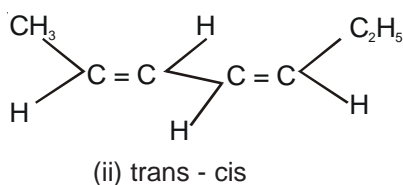
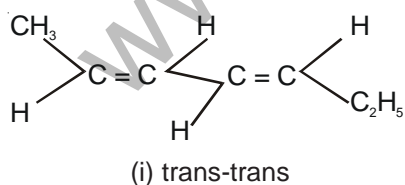


- Q.14** Which of the following can exhibit cis-trans isomerism -
 [1] $HC\equiv CH$ [2] $ClCH=CHCl$ [3] $CH_3CHClCOOH$ [4] $ClCH_2-CH_2Cl$

Sol. Remember that cis-trans geometrical isomerism is possible only in alkenes and further only in those alkenes in which the doubly bonded carbon atoms individually have different atoms/groups.

- Q.15** The number of geometrical isomers in case of a compound with the structure $CH_3-CH=CH-CH=CH-C_2H_5$ is -
 [1] 4 [2] 3 [3] 2 [4] 5

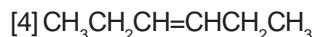
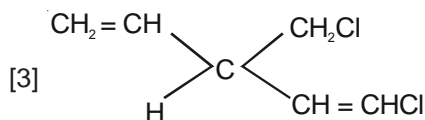
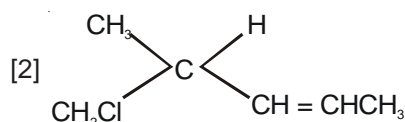
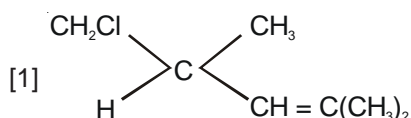
Sol. Recall that in an alkene containing n number of dissimilarly substituted double bonds, the number of geometrical isomers is given by 2^n . Since here $n = 2$, therefore number of geometrical isomers will be $2^2 = 4$



- Q.16** The compound $C_4H_{10}O$ can show -
 [1] Metamerism [2] Functional isomerism [3] Positional isomerism [4] All types

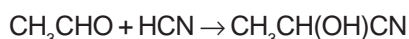
Sol. The molecular formula $C_4H_{10}O$ reminds us that the compound can be an ether which is isomeric with alcohol. Further ethers can show metamerism while alcohols can show position isomerism.

Q.17 Which one of the following will not show geometrical isomerism -



Sol. Here note that in [1] two similar groups ($-\text{CH}_3$) are present on one of the doubly bonded carbon atom while in others the two doubly bonded carbon atoms have different atoms (groups).

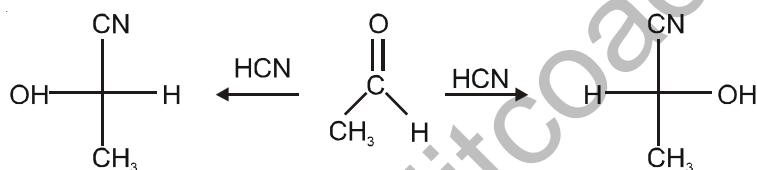
Q.18 In the reaction



a chiral centre is produced. Thus product would be -

- [1] Meso compound [2] Racemic mixture [3] Laevorotatory [4] Dextrorotatory

Sol. Synthesis of a chiral compound from a chiral compound in the absence of optically active agent always produces a racemic modification



l - lactonitrile

acetaldehyde

d-lactonitrile

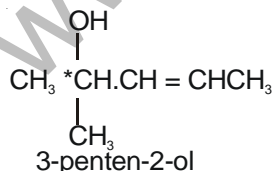
Q.19 The molecule 3-penten-2-ol can exhibit -

- (a) Optical isomerism (b) Geometrical isomerism
(c) Metamerism (d) Tautomerism

The correct answer is -

- [1] a and b [2] a and c [3] b and c [4] a and d

Sol.



Note the presence of asymmetric carbon atom (denoted by asterisk*) which gives rise to optical isomerism. Presence of double bond whose each carbon atom has two different group gives rise to geometrical isomerism.

Q.20 The least number of carbon atoms for an alkane to show stereoisomerism is -

- [1] 2 [2] 3 [3] 4 [4] 5

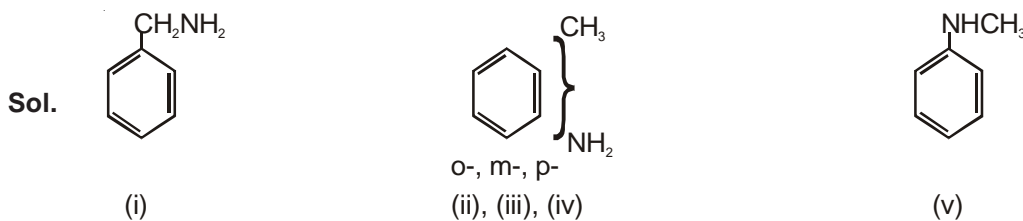
Sol. Ethane with two carbon atom shows conformational isomerism (staggered and eclipsed conformers.)

ISOMERISM

Q.21 The isomerism observed in alkanes is -
 [1] metamerism [2] Chain isomerism [3] Position isomerism [4] Geometrical isomerism

Sol. Alkanes are saturated hydrocarbons without any functional group, hence can show chain isomerism only.

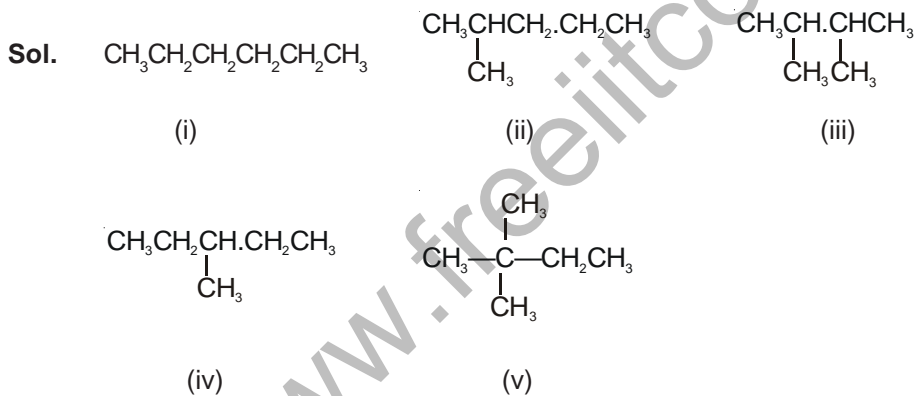
Q.22 Number of isomeric forms of C_7H_9N having benzene ring will be -
 [1] 7 [2] 6 [3] 5 [4] 4



Q.23 Which of the following is an isomer of diethyl ether -
 [1] $(CH_3)_3COH$ [2] $(CH_3)CHO$ [3] C_3H_7OH [4] $(C_2H_5)_2CHOH$

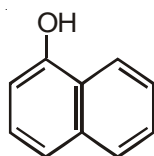
Sol. Diethyl ether has 4 carbon atoms, among different alternative alcohols only $(CH_3)_3COH$ has 4 carbon atoms.

Q.24 How many chain isomers can be obtained from the alkane C_6H_{14} is :-
 [1] 4 [2] 5 [3] 6 [4] 7

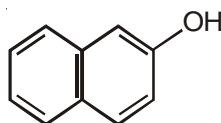


Q.25 Which of the following is an example of position isomerism -
 [1] Iso-pentane and neo-pentane [2] Glucose and fructose
 [3] Ethanol and dimethyl ether [4] α - Naphthol and β - naphthol

Sol. As the name indicates α - naphthol and β - naphthol differ in the position on the alcoholic group.

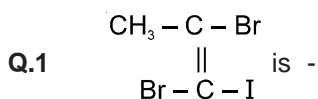


α - naphthol



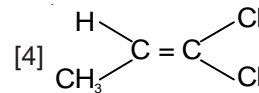
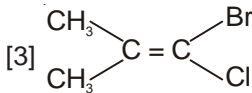
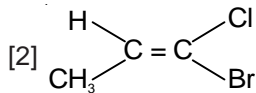
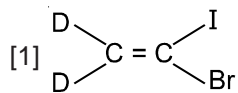
β - naphthol

Exercise # 1



- [1] trans [2] z [3] Both correct [4] none is correct

Q.2 Which of the following compounds will exhibit geometrical isomerism -



Q.3 Optically active isomers but not mirror images are called -

- [1] Enantiomers [2] Mesomeres [3] Tautomers [4] Diastereomers

Q.4 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

Q.5 Number is chiral carbon atom in  is -

- [1] 2 [2] 3 [3] 4 [4] 1

Q.6 The priority of groups. OH, COOH, CHO, OCH₃ attached to a chiral carbon is in order -

- [1] OH > COOH > CHO > OCH₃ [2] OCH₃ > OH > CHO > COOH
[3] OCH₃ > OH > COOH > CHO [4] OCH₃ > COOH > CHO > OH

Q.7 Which of the following statement is not true -

- [1] Homologues cannot be isomers but isomers can be homologues
[2] Isomers can not be homologues
[3] The number of paired and unpaired electrons in various resonating forms is equal
[4] Tautomers differ in atomic as well as electronic arrangement

Q.8 Which of the following statement is correct -

- [1] Geometrical isomerism is possible in compounds which contain double bond
[2] Geometrical isomerism is not possible in compound containing no double bonds
[3] Several compounds show optical isomerism, even though they do not contain an asymmetric carbon
[4] All the above statements

Q.9 The number of isomers for the compound with molecular formula C₂H₃BrClF is -

- [1] 3 [2] 4 [3] 5 [4] 6

Q.10 The maximum number of acyclic isomers for an alkene with molecular formula C₄H₈ is -

- [1] 5 [2] 4 [3] 2 [4] 3

- Q.11** Which of the following pair shows isomerism -
 [1] CH_2Cl_2 and CHCl_3 [2] $\text{CH}_3 - \text{O} - \text{CH}_3$ and $\text{C}_2\text{H}_5\text{OH}$
 [3] C_3H_6 and C_3H_8 [4] C_2H_4 and C_3H_6
- Q.12** The compound $\text{C}_4\text{H}_{10}\text{O}$ can show -
 [1] Metamerism [2] Functional isomerism
 [3] Position isomerism [4] All types
- Q.13** Only two isomeric monochloro derivatives are possible for -
 [1] 1-methyl propane [2] n-butane
 [3] Benzene [4] 2,4-dimethyl pentane
- Q.14** How many isomers can be obtained from C_6H_{14} -
 [1] 7 [2] 4 [3] 5 [4] 6
- Q.15** The number of isomers of an alkane having molecular mass 72 is :
 [1] 2 [2] 3 [3] 4 [4] 5
- Q.16** Ethyl acetoacetate exhibits :
 [1] Optical isomerism [2] Geometrical isomerism
 [3] Tautomerism [4] Enantiomerism
- Q.17** Isomerism exhibited by acetic acid and methyl formate is :
 [1] Functional [2] Chain [3] Geometrical [4] Optical
- Q.18** The number of different amines corresponding to the formula $\text{C}_3\text{H}_9\text{N}$ is :
 [1] 2 [2] 3 [3] 4 [4] 5
- Q.19** Ethoxy ethane and methoxy propane are :
 [1] Geometrical isomers [2] Optical isomers
 [3] Functional group isomers [4] Metamers
- Q.20** n-pentane and neo-pentane are :
 [1] Functional isomers [2] Geometrical isomers
 [3] Chain isomers [4] Position isomers
- Q.21** Number of dibromo derivatives possible for propane are-
 [1] 2 [2] 3 [3] 1 [4] 4
- Q.22** How many isomeric pentynes (C_5H_{10}) are possible -
 [1] 3 [2] 4 [3] 5 [4] 6
- Q.23** Which of the following alkanes can form only two monochloro derivatives -
 [1] hexane [2] 2-Methyl pentane [3] 2, 3-Dimethylbutane [4] 3-Methyl pentane
- Q.24** The number of monosubstituted derivatives possible for naphthalene is -
 [1] one [2] two [3] three [4] four
- Q.25** The functional isomer of ethane nitrile is-
 [1] Methane carbonylamine [2] Methane nitrile [3] Ethane carbonylamine [4] Propane nitrile.

ISOMERISM

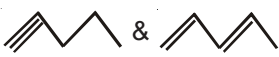
- Q.26** Which of the following pairs of compounds are tautomers -
[1] Propanol and propanone [2] 1-Propanol and 2-propanol
[3] Ethanol and vinyl alcohol [4] Vinyl alcohol and ethanal.
- Q.27** Anthracene is isomeric with-
[1] Phenanthrene [2] Naphthalene [3] Benzene [4] None of these
- Q.28** Which of the following conformations of n-butane is the least stable -
[1] Gauche [2] Anti [3] Eclipsed [4] Fully eclipsed.
- Q.29** Which of the following conformations of butane is most stable -
[1] Skew [2] Anti [3] Gauche [4] Eclipsed.
- Q.30** The least stable conformation of cyclohexane is -
[1] Boat [2] Chair [3] Twist boat [4] Half chair.
- Q.31** The energy difference between boat and chair conformations of cyclohexane is about -
[1] 150 kJ/mole [2] 30 kJ/mole [3] 12.5 kJ/mole [4] 50 kJ/mole
- Q.32** The energy difference between staggered and eclipsed conformations of ethane is about -
[1] 25 kJ/mole [2] 30 kJ/mole [3] 100 kJ/mole [4] 12.5 kJ/mole
- Q.33** cis-2- Butene and trans-2-butene can be distinguished on the basis of -
[1] their hydrogenation products [2] their optical rotation
[3] their ozonolysis products [4] their addition products with bromine.
- Q.34** Which of the following isomerism is shown by alkenes but not by alkanes -
[1] Conformational [2] Optical [3] Geometrical [4] Chain.
- Q.35** Geometrical isomerism will be exhibited by -
[1] 1-Pentene [2] 3-Methyl-1-butene [3] 2-Pentene [4] All of these compounds
- Q.36** Which of the following compounds can show geometric isomerism -
[1] Vinyl chloride [2] 1, 1-Dichloroethene [3] 1, 2-Dichloroethene [4] Trichloroethene.
- Q.37** The simplest alkene which is capable of exhibiting geometrical isomerism has -
[1] 3 carbon atoms [2] 5 carbon atoms [3] 6 carbon atoms [4] 4 carbon atoms.
- Q.38** Which of the following compounds does not exhibit geometric isomerism -
[1] 1,1-Dichloro-2-butene [2] 1,2-Dichloro-2-butene [3] 1,1-Dichloro-1-butene [4] 2,3-Dichloro-2-butene
- Q.39** A racemic mixture contains equal of dextrorotatory and levorotatory isomers-
[1] No. of molecules [2] Masses [3] No. of moles [4] All the above are correct
- Q.40** Which of the following can exist as diastereomers -
[1] Lactic acid [2] 1-Butene [3] 2-Butene [4] Ethane.
- Q.41** Which of the following can exist as enantiomers -
[1] CH_3COOH [2] $\text{CH}_3\cdot\text{CH}(\text{OH})\cdot\text{COOH}$ [3] $\text{CH}_3\cdot\text{CH}_2\cdot\text{COOH}$ [4] $\text{HOOC}\cdot\text{CH}_2\cdot\text{COOH}$
- Q.42** A compound whose molecules are optically active even though they contain asymmetric carbon atoms is called
[1] A threo compound [2] A erythro compound
[3] A dissymmetric compound [4] A meso compound
-

- Q.43** Which of the following statements is false -
 [1] Enantiomers have same m.p. and b.p.
 [2] A mixture containing equal amounts of enantiomers is optically inactive
 [3] Enantiomers have identical chemical properties
 [4] A mixture containing two enantiomers can be separated into fractions containing pure enantiomers
- Q.44** The simplest alkane which can exhibit enantiomerism has -
 [1] 5 carbon atoms [2] 6 carbon atoms [3] 7 carbon atoms [4] 4 carbon atoms
- Q.45** Which of the following does not contain any asymmetric carbon but can show enantiomers -
 [1] Lactic acid [2] 1, 3-Pentadiene [3] Tartaric acid [4] 2, 3-Pentadiene
- Q.46** Enantiomerism was discovered by-
 [1] Vant Hoff and Le Bell [2] Louis Pasteur [3] Berzelius [4] Kolbe.
- Q.47** (+)-Tartaric acid and meso-tartaric acid are -
 [1] Enantiomers [2] Diastereomers [3] geometric isomers [4] None of these
- Q.48** Which of the following compounds can exist in meso-form-
 [1] 1, 2-Dichlorobutane [2] 2, 3-DichloroPentane [3] 2, 3-Dichlorobutane [4] 1, 2-DichloroPentane
- Q.49** The angle of rotation of plane polarized light in polarimeter depends upon-
 [1] Conc. of the substance [2] Length of the tube [3] Nature of the substance [4] All of these
- Q.50** Which of the following compounds exhibit tautomerism -
 [1] Chloroethane [2] Ethanal [3] Ethoxyethane [4] Nitroethane

Answer Key

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	3	2	4	1	1	3	1	4	1	4	2	4	2	3	2	3	1	3	4	3
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	4	1	3	3	1	4	1	4	2	4	2	4	4	3	3	3	4	3	4	3
Que.	41	42	43	44	45	46	47	48	49	50										
Ans.	2	4	3	3	4	2	2	3	4	2										

Exercise # 2

- Q.1** The instrument used for measuring specific rotation is -
 [1] Spectrometer [2] Polarimeter [3] Lactometer [4] Ammeter
- Q.2** Which of the following is responsible for the inability of meso compound to show optical activity -
 [1] Absence of chirality centre [2] Presence of more than one chirality centres
 [3] Dissymmetric nature of its structure [4] Internal compensation.
- Q.3** The term isomers was given by-
 [1] Faraday [2] Berzelius [3] Kekule [4] von Hoff
- Q.4** Isomers have similar-
 [1] Structural formula [2] Molecular formula [3] Chemical properties [4] Physical properties
- Q.5** Total possible number of alcohols for molecular formula $C_5H_{12}O$ would be -
 [1] 4 [2] 6 [3] 8 [4] 5
- Q.6** All alkane forming isomers if the number of least carbon atom is -
 [1] 1 [2] 2 [3] 3 [4] 4
- Q.7** Only one monochloro derivative is possible for -
 [1] n-Butane [2] Isobutane [3] Neo-pentane [4] n-Pentane
- Q.8** The total number of isomeric tolyl groups are -
 [1] 1 [2] 2 [3] 3 [4] 4
- Q.9** How many aliphatic carbonyl compounds are possible having the molecular formula $C_5H_{10}O$ -
 [1] 4 [2] 5 [3] 6 [4] 7
- Q.10** How many chain isomers can be obtained from the alkane C_6H_{14} -
 [1] 4 [2] 5 [3] 6 [4] 7
- Q.11** The total possible number of chain isomers for the molecular formula C_5H_{12} would be -
 [1] 3 [2] 2 [3] 4 [4] 5
- Q.12** Butanol-1- & ter alcohol of 4C atoms are called -
 [1] Position isomers [2] Functional isomers [3] Chain isomers [4] All the above
- Q.13** 1-Hexene & cyclo-hexane are -
 [1] Chain isomers [2] Ring chain isomers [3] Tautomers [4] Geometrical isomers
- Q.14** The total position isomers for molecular formula $C_4H_8Cl_2$ would be -
 [1] 3 [2] 4 [3] 6 [4] 5
- Q.15**  are called as -
 [1] Position isomers [2] Chain isomers [3] Functional isomers [4] Ring chain isomers
- Q.16** CH_3-CH_2-CHO & $CH_2=CH-CH_2OH$ are -
 [1] Functional isomers [2] Tautomers [3] Position isomers [4] Metameres
- Q.17**  are -
 [1] Tautomers [2] Functional isomers [3] Position isomers [4] All the above
- Q.18** O-Cresol & benzyl alcohol are -
 [1] Functional isomers [2] Position isomers [3] Chain isomers [4] All the above

Q.19 CH_3CONH_2 & HCONHCH_3 are called -

- [1] Position isomers [2] Chain isomers [3] Tautomers [4] Functional isomers

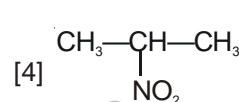
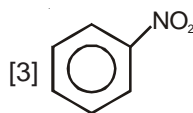
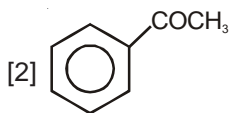
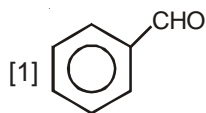
Q.20  &  show isomerism -

- [1] Chain [2] Position [3] Functional [4] None of these

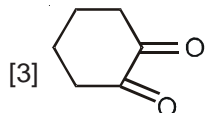
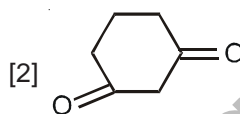
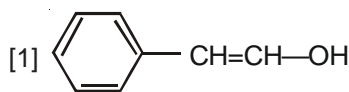
Q.21 Glucose exhibit type of isomerism -

- [1] Position [2] Functional [3] Tautomerism [4] No isomerism

Q.22 Which of the following compounds can exhibit tautomerism -



Q.23 Tautomerism is exhibited by -

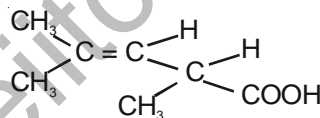


[4] All the above

Q.24 The total number of structural isomers possible for hydrocarbon C_3H_8 is -

- [1] 3 [2] 4 [3] 1 [4] 6

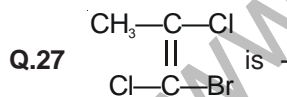
Q.25 The following compound can exhibit -



- [1] Geometrical isomerism [2] Geometrical and optical isomerisms
[3] Optical isomerism [4] Tautomerism

Q.26 Structural isomers possible for $\text{C}_4\text{H}_8\text{Br}_2$ are -

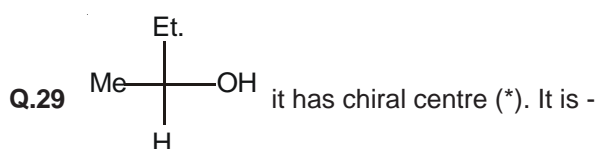
- [1] 9 [2] 8 [3] 7 [4] 6



- [1] Trans [2] Z [3] Both are correct [4] None is correct

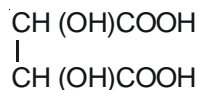
Q.28 Geometrical isomerism is due to -

- [1] The restricted rotation about a double bond [2] The presence of keto group
[3] The presence of $\text{CH}(\text{OH})$ group [4] The presence of an asymmetric carbon



- [1] R [2] S [3] Both [4] None

Q.37 Number of optically active isomers of tartaric acid is -



- [1] 2 [2] 3 [3] 4 [4] 5

Q.38 How many conformations does ethane have -

- [1] 1 [2] 2 [3] 3 [4] Infinite

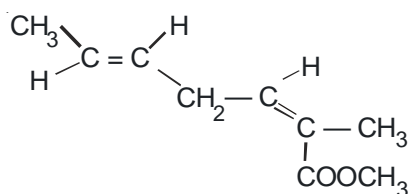
Q.39 The eclipsed and staggered conformation of ethane is due to -

- [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

Q.40 A compound can be divided into two equal halves & contains even 'n' asymmetric carbon atoms. The number of optical isomer is -

- [1] 2^n [2] $2^{(n-1)}$ [3] $2^{(n/2-1)}$ [4] $2^{n-1} + 2^{(n/2-1)}$

Q.41 The correct stereochemical name of -



- [1] Methyl 2-methylhepta (2E, 5E) dienoate [2] Methyl 2-methylhepta (2Z, 5Z) dienoate
[3] Methyl 2-methylhepta (2E, 5Z) dienoate [4] Methyl 2-methylhepta (2Z, 5E) dienoate

Q.42 The maximum number of alkene with molecular formula C_4H_8 is -

- [1] 2 [2] 3 [3] 4 [4] 5

Q.43 Ordinary light can be converted into plane polarized light with the help of a -

- [1] Nickel prism [2] Nickol prism [3] Diffraction grating [4] Quartz cell

Q.44 Isomers which can be inter converted through rotation around a single bond are -

- [1] Conformers [2] Diastereomers [3] Enantiomers [4] Position isomers

Q.45 Which of the following compounds will exhibit geometrical isomerism -

- [1] 1-Phenyl-2-butene [2] 3-Phenyl-1-butene [3] 2-Phenyl-1-butene [4] 1, 1-Diphenyl-1-propene

Q.46 The phenomenon involving the migration of a proton to give two structural isomers in equilibrium with each other is known as -

- [1] Metamerism [2] Tautomerism [3] Cis trans isomerism [4] Stereo isomerism

Q.47 The number of isomers for the aromatic compounds of the formula C_7H_8O is -

- [1] 2 [2] 3 [3] 4 [4] 5

Q.48 An isomer of 1-propanol is -

- [1] Propanal [2] 2-Propanal [3] Ethanol [4] Ethyl methyl ether

Q.49 Maleic acid and fumaric acid are -

- [1] Position isomers [2] Functional isomers [3] Geometrical isomers [4] Optical isomers

Q.50 In the reaction $(CH_3)_2C = CH_2 + HOCl$, the major product is -

- [1] $(CH_3)_2\underset{\text{OCl}}{\text{C}}-\text{CH}_3$ [2] $(CH_3)_2\underset{\text{OH}}{\text{C}}-\text{CH}_2\text{Cl}$ [3] $(CH_3)_2\underset{\text{Cl}}{\text{C}}-\text{CH}_2\text{OH}$ [4] $(CH_3)_2\underset{\text{H}}{\text{C}}-\text{CH}_2\text{OCl}$

ISOMERISM

Q.51 The formula C_4H_8O represents -

- [1] Only an acid [2] Only an ether
[3] Only an alcohol [4] Both cyclic ether and unsaturated alcohol

Q.52 Meso form of tartaric acid is -

- [1] Dextrorotatory [2] Leavorotatory
[3] Neither Leavo nor dextro rotatory due to internal compensation
[4] A mixture of equal quantities of dextro and leavo rotatory forms

Q.53 Following two isomer are -



- [1] Enantiomers [2] Mesomers [3] Diastereomers [4] Position isomer

Q.54 Optical activity is expected for -

- [1] 2-methyl propanoic acid [2] Methyl 2-methyl propanoate
[3] Methyl 2-chloro propanoate [4] Propanoic acid

Q.55 Ethyl acetate and methyl propionate are -

- [1] Chain isomers [2] Metamers [3] Tautomers [4] None of the above

Q.56 The process of separation of racemic modifications into d and l enantiomer is called -

- [1] Resolution [2] Dehydration [3] Revolution [4] Dehydrohalogenation

Q.57 Which of the following will show geometrical isomerism -

- [1] $CH_3CH=CH_2$ [2] $CH_3-\overset{\text{Br}}{\underset{|}{C}}=\overset{\text{Br}}{\underset{|}{C}}-CH_2CH_3$ [3] $CH_3CH_2CH_2CH=CH_2$ [4] $CH_2=CH-CH_2-CH_3$

Q.58 Compound which shows optical activity, is -

- [1] $CH_3-CHOH-CH_3$ [2] $\begin{array}{c} CH_3 \\ | \\ CH \\ | \\ CH_3 \end{array} CHCH_2CH_3$ [3] $CH_3-CHClCH_2CH_3$ [4] $CH_3-CCl_2-CH_2CH_3$

Q.59 Which of the following molecules has an asymmetric carbon atom -

- [1] CH_3CH_2COOH [2] $ClCH_2CH_2COOH$ [3] $Cl_2CHCOOH$ [4] $CH_3CHClCOOH$

Q.60 Molecular formula of an optically active organic compound is $C_4H_{10}O$. Its structure is -

- [1] $C_2H_5OC_2H_5$ [2] $CH_3OC_3H_7$ [3] $CH_3CH_2CH_2OH$ [4] $CH_3CHOHCH_2CH_3$

Q.61 Number of possible metamers of triethylamine is -

- [1] 3 [2] 2 [3] 1 [4] 0

Q.62 Optical rotation of a racemic mixture is always -

- [1] Positive [2] Negative [3] Zero [4] Can not be predicted

Q.63 Methyl propyl thioether and isopropyl methyl thioether are -

- [1] Metamers [2] Position isomers
[3] Chain isomers [4] metamers and position both

- Q.64** Ethylethanoate and α -methyl propionic acid are -
 [1] Chain isomers [2] functional isomers [3] Geometrical isomers [4] Optical isomers
- Q.65** An isomer of pentane gives only one monochloropentane on chlorination at 300°C. This pentane is -
 [1] Isopentane [2] Neopentane [3] n-Pentane [4] None of the above
- Q.66** Those compounds show metamerism in which -
 [1] Two alkyl groups are present on a monovalent functional group or atom
 [2] Two alkyl groups are present on polyvalent functional group or atom
 [3] Functional group is not present
 [4] None of the above
- Q.67** Which of the following compounds can exist as geometrical isomers -
 [1] CH_2Cl_2 [2] $\text{CH}_2\text{Cl}-\text{CH}_2\text{Cl}$ [3] $\text{CHBr}=\text{CHCl}$ [4] $\text{CH}_2\text{Cl}-\text{CH}_2\text{Br}$
- Q.68** What is true for 1,2-pentadiene -
 [1] It is functional isomer of pentyne [2] It is position isomer of pentyne
 [3] It is chain isomer of 3-methyl-1-butyne [4] It is metamer of cyclopentene
- Q.69** Possible number of disubstituted benzene isomers is -
 [1] 1 [2] 2 [3] 3 [4] 4
- Q.70** The compound having asymmetric carbon atom is -
 [1] $\text{CH}_3\text{CHOHCH}_3$ [2] $(\text{CH}_3)_2\text{C}(\text{C}_2\text{H}_5)_2$ [3] $\text{C}_2\text{H}_5\text{CHClCH}_3$ [4] $\text{C}_2\text{H}_5\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- Q.71** How many structural isomers are possible for pentane, C_5H_{12} is -
 [1] 2 [2] 5 [3] 4 [4] 3
- Q.72** The number of isomers of nitro phenol is -
 [1] No isomerism (only one compound is possible.) [2] Two isomers
 [3] Three isomers [4] Four isomers
- Q.73** Which of the following starred C- atom is asymmetric -
 [1] $\text{CH}_3\text{CH}_2\text{C}^*\text{HCH}_3\text{CH}_2\text{OH}$ [2] $\text{CH}_3\text{CH}_2\text{CHC}^*\text{H}_3\text{CH}_2\text{OH}$ [3] $\text{CH}_3\text{C}^*\text{H}_2\text{CHCH}_3\text{CH}_2\text{OH}$ [4] $\text{CH}_3\text{CH}_2\text{CH}_3\text{C}^*\text{H}_2\text{OH}$
- Q.74** Which of the following will show optical isomerism -
 [1] 1-Butanol [2] 2-Butanol [3] 3-Pentanol [4] 4-Heptanol
- Q.75** The total number of optically active isomer for $\text{CH}_2\text{OH}(\text{CHOH})_3\text{CHO}$ is -
 [1] 2 [2] 4 [3] 8 [4] 12

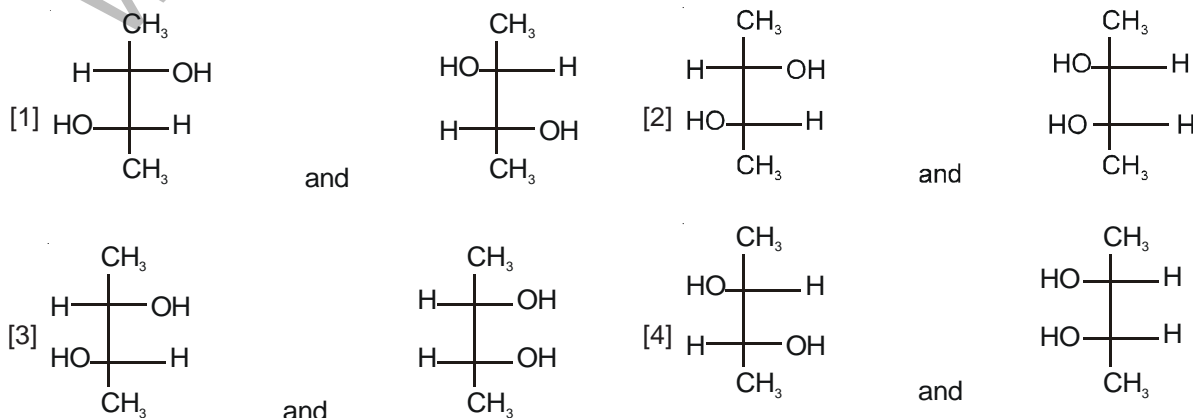
Answer Key

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	2	4	2	2	3	4	3	4	3	2	1	3	2	3	1	1	2	1	4	3
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	3	2	4	3	3	1	3	1	2	4	1	3	3	1	4	1	1	4	1	4
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	4	3	2	1	1	2	4	4	3	2	4	3	3	3	2	1	2	3	4	4
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75					
Ans.	1	3	4	2	2	2	3	1	3	3	4	3	1	2	3					

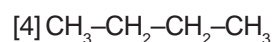
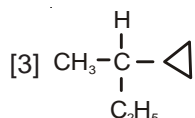
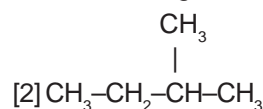
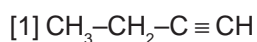
Exercise # 3

- Q.1** Choose the compound showing optical isomerism - [PET-87]
 [1] $\text{CH}_2(\text{OH})\text{COOH}$ [2] $\text{CH}_3\text{CH}(\text{OH})\text{COOH}$ [3] CH_2F_2 [4] $(\text{CH}_3)_2\text{CHCOOH}$
- Q.2** Which of the following pair show functional group isomerism - [PET-89]
 [1] $\text{CH}_3\text{-CO-CH}_3$ and $\text{CH}_3\text{-CH}_2\text{CHO}$ [2] $\text{CH}_3\text{-CO-C}_3\text{H}_7$ and $\text{C}_2\text{H}_5\text{-O-C}_2\text{H}_5$
 [3] $\text{CH}_3\text{-CH(CH}_3\text{)-CH}_3$ and $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3$ [4] $\text{CH}_3\text{COOCH}_3$ and HCOOC_2H_5
- Q.3** Number of isomers of $\text{C}_3\text{H}_6\text{Br}_2$ are - [PET-92]
 [1] 3 [2] 4 [3] 5 [4] 2
- Q.4** Optical isomerism is shown by - [PET(MP)-94]
 [1] Butanol - 1 [2] Butanol - 2 [3] Butene - 1 [4] Butene - 2
- Q.5** Number of optical isomers for a compound containing 'n' asymmetric carbon atoms would be - [PET(MP)-94]
 [1] 2^{n+1} [2] 2^n [3] 2^n [4] 2^{n-1}
- Q.6** $\text{CH}_3\text{-CHCl}_2$ and $\text{CH}_2\text{Cl-CH}_2\text{Cl}$ show the isomerism - [PET-94, PMT-96]
 [1] Position [2] Optical [3] Geometrical [4] Metamerism
- Q.7** Which of the following type of isomerism is shown by pentanone - [PET(MP)-95]
 [1] Chain isomerism [2] Position isomerism [3] Functional isomerism [4] All of the
- Q.8** Isomers of $\text{C}_4\text{H}_{10}\text{O}$ are - [PET-96, PMT-95]
 [1] 4 [2] 5 [3] 7 [4] 6
- Q.9** Which of the following compound does not show geometrical isomerism -
 [1] 2-Butene [2] Penten-2 [3] 2,3 Dibromo-2-butene [4] 2-Methyl propene
- Q.10** The number of isomers of C_6H_{14} is- [CPMT-84]
 [1] 4 [2] 5 [3] 6 [4] 7
- Q.11** Which of the following ether compound will show metamerism - [CBSE-96]
 [1] $\text{CH}_3\text{-CO-C}_3\text{H}_7$ [2] $\text{C}_2\text{H}_5\text{-S-C}_2\text{H}_5$ [3] $\text{CH}_3\text{-O-CH}_3$ [4] $\text{CH}_3\text{-O-C}_2\text{H}_5$
- Q.12** Ethoxy ethane and methoxy propane are - [CBSE-90]
 [1] Geometrical isomers [2] Optical isomers
 [3] Functional group isomers [4] Metamers
- Q.13** How many isomers of $\text{C}_5\text{H}_{11}\text{OH}$ will be primary alcohols - [CBSE-92]
 [1] 5 [2] 4 [3] 3 [4] 2
- Q.14** The compound which is not isomeric with diethyl ether - [IIT-87]
 [1] N-Propyl methyl ether [2] Butanol-1 [3] 2-Methyl propane-2-ol [4] Butanone
- Q.15** Which of the following compounds is not chiral - [CPMT-98]
 [1] $\text{DCH}_2\text{CH}_2\text{CH}_2\text{Cl}$ [2] $\text{CH}_3\text{CH}_2\text{CHDCl}$ [3] $\text{CH}_3\text{CHDCH}_2\text{Cl}$ [4] $\text{CH}_3\text{CHClCH}_2\text{D}$
- Q.16** Which of the following is a chiral compound - [CPMT-99]
 [1] 2-methyl pentanoic acid [2] 3-methyl pentanoic acid
 [3] 4-methyl pentanoic acid [4] (1) and (2)
- Q.17** 2-butene shows geometrical isomerism due to - [CPMT-2000]
 [1] Restricted rotation about double bond [2] Free rotation about double bond
 [3] Free rotation about single bond [4] Chiral carbon

- Q.18** A compound of molecular formula is C_7H_{16} shows optical isomerism, compound will be - **[CPMT-2001]**
 [1] 2, 3-dimethyl pentane [2] 2, 2-dimethyl butane [3] 2-methyl hexane [4] None of the above
- Q.19** Geometrical isomers are differ in - **[CPMT-2002]**
 [1] Position of functional group [2] Position of atoms
 [3] Spactical arrangement of atoms [4] Length of carbon chain
- Q.20** Main condition for optical isomerization is - **[RPMT-2000]**
 [1] Asymmetric carbon atom [2] Symmetrical chiral molecule
 [3] Symmetrical straight line [4] Symmetrical molecule
- Q.21** Which pair shows chain isomerism :-
 [1] CH_3CHCl_2 & $CICH_2Cl$ [2] Propyl alcohol and iso propyl alcohol
 [3] 2-methyl butane and neopentane [4] Diethyl ether and propyl ether
- Q.22** Which isomerism is present in n-butyl alcohol and iso butyl alcohol - **[RPMT-2000]**
 [1] Position [2] Chain [3] Optical [4] Geometrical
- Q.23** Which of the following pairs are isomers - **[RPMT-2001]**
 [1] C_5H_{10} and $C_{10}H_{20}$ [2] $CH_3(CH_2)_4CH_3$ and $CH_3(CH_2)CH_3$
 [3] $\begin{array}{c} C-C-C-C-C \\ | \quad | \quad | \\ C \quad C \quad C \end{array}$ and $\begin{array}{c} C-C-C-C-C \\ | \\ C \end{array}$ [4] $(CH_3)_3CH$ and $CH_3CH_2CH_2CH_3$
- Q.24** Which compound is chiral - **[RPMT-2002]**
 [1] Butane [2] 1-chloro-2-methyl butane
 [3] 2-methyl butane [4] 2-methyl propane
- Q.25** Methyl acetate and propionic acid are - **[RPMT-2002]**
 [1] Functional isomer [2] Structural isomer [3] Stereo isomer [4] Geometrical isomer
- Q.26** Total isomer of C_4H_{10} is - **[RPMT-2002]**
 [1] Zero [2] 2 [3] 3 [4] 4
- Q.27** Isomers of propionic acid are - **[MP PMT-2002]**
 [1] $HCOOC_2H_5$ and CH_3COOCH_3 [2] $HCOOC_2H_5$ and C_3H_7COOH
 [3] CH_3COOCH_3 and C_3H_7OH [4] C_3H_7OH and CH_3COCH_3
- Q.28** The functional isomer of ethyl alcohol is - **[MP PMT-2002]**
 [1] CH_3OCH_3 [2] CH_3COCH_3 [3] CH_3COOH [4] CH_3CH_2CHO
- Q.29** Compounds $CH_3CH_2OCH_2CH_3$ and $CH_3OCH_2CH_2CH_3$ are - **[MP PMT-2002]**
 [1] Tautomers [2] Metamers [3] Functional isomers [4] Optical isomers
- Q.30** Which of the following pairs of compounds are enantiomers - **[CBSE-2003]**



Q.31 Amongst the following compounds, the optically active alkane having lowest molecular mass is



[AIEEE-2004]

Q.32 Which one of the following pairs represents stereoisomerism ?

[CPMT-2005]

- [1] Structural isomerism and Geometric isomerism [2] Linkage isomerism and Geometric isomerism
 [3] Chain isomerism and Rotational isomerism [4] Optical isomerism and Geometric isomerism

Q.33 Of the five isomeric hexanes, the isomer which can give two monochlorinated compounds is

[AIEEE-2005]

- [1] 2, 3-dimethylbutane [2] n-hexane [3] 2-methylpentane [4] 2, 2-dimethylbutane

Q.34 Which of the following is not chiral

[CPMT-2006]

- [1] 3-Bromopentane [2] 2-Hydroxypropanoic acid
 [3] 2-Butanol [4] 2,3-Dibromopentane

Q.35 The term anomers of glucose refers to

[AIEEE-2006]

- [1] A mixture of (D)-glucose and (L)-glucose
 [2] Enantiomers of glucose
 [3] Isomers of glucose that differ in configuration at carbon one (C-1)
 [4] Isomers of glucose that differ in configuration at carbons one and four (C-1 and C-4)

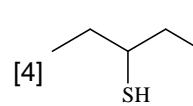
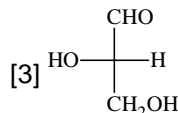
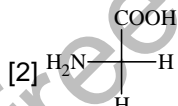
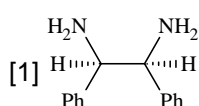
Q.36 Increase order of stability among the three main conformation (i.e. Eclipse, Anti, Gauche) of 2-fluoroethanol is

[AIEEE-2006]

- [1] Gauche, Eclipse, Anti [2] Eclipse, Anti, Gauche
 [3] Anti, Gauche, Eclipse [4] Eclipse, Gauche, Anti

Q.37 Which of the following molecules is expected to rotate the plane of plane polarized light?

[AIEEE-2007]



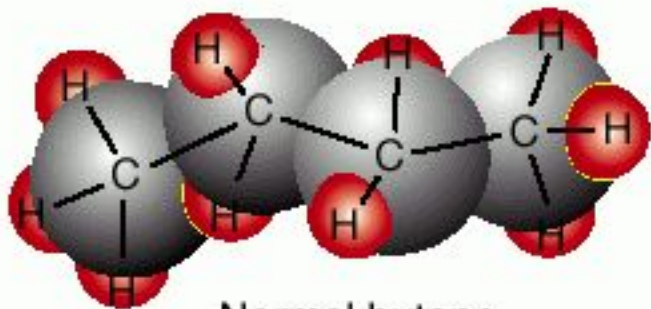
Q.38. Which one of the following conformations of cyclohexane is chiral ?

[AIEEE-2007]

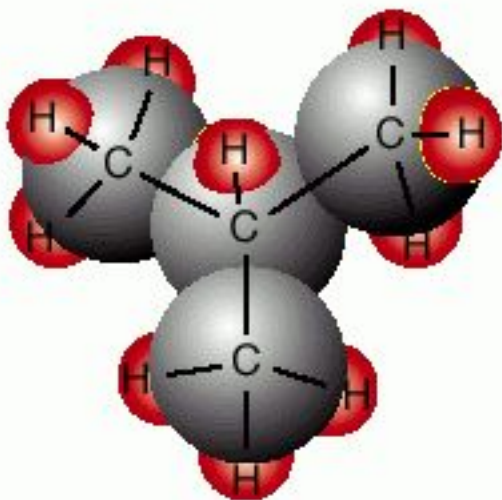
- [1] Chair [2] Boat [3] Twist boat [4] Rigid

Answer Key

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Ans.	2	1	2	2	3	1	4	3	4	2	2	4	2	4	1	4	1	1	3	1	
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36					
Ans.	3	2	4	2	1	2	1	1	2	1	3	4	1	1	3	2					



Normal butane



Isobutane