Chapter 02

Isomerism

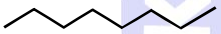
TOPIC WISE QUESTIONS

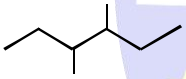
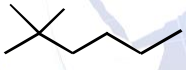
STRUCTURAL ISOMERISM

Q.1 Isomers have essentially identical :
(1) Structural formula
(2) Chemical properties
(3) Molecular formula
(4) Physical properties

Q.2 Compounds with same molecular formula but different structural formulae are called:
(1) Isomers (2) Isotopes
(3) Isobars (4) Isoelectric

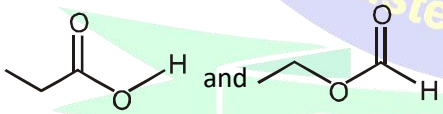
Q.3 Which compound is not the isomer of 3-Ethyl-2-methylpentane ?

(1)  (2) 

(3)  (4) 

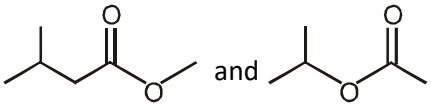
Q.4 What is the relation between 3-Ethylpentane and 3-Methylhexane ?
(1) Chain isomers (2) Position isomers
(3) Functional isomers (4) No relation

Q.5 Identify the relationship between the given compounds.



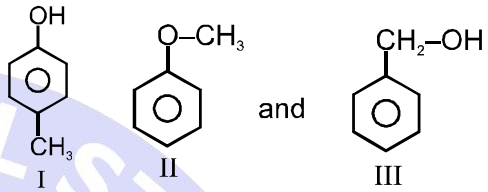
(1) Chain Isomers
(2) Functional isomers
(3) Homologous
(4) Position Isomers

Q.6 Identify the relationship between the given compounds.



(1) Chain Isomers (2) Functional isomers
(3) Homologus (4) Position Isomers

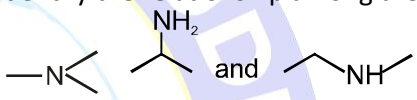
Q.7 Identify the relationship among the followings :



I II III

(1) Chain Isomers (2) Functional isomers
(3) Metamers (4) Position Isomers

Q.8 Identify the relationship among the followings :



I II III

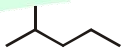
(1) Chain Isomers (2) Functional isomers
(3) Metamers (4) Position Isomers

Q.9 Identify the relationship among the followings :

I II III

(1) Chain Isomers (2) Functional isomers
(3) Metamers (4) Position Isomers

Q.10 Which of the following pairs are called position isomers;
(1) $CH_2(OH)CH_2CO_2H$ & $CH_3CH(OH)CO_2H$
(2) C_2H_5OH & CH_3OCH_3
(3) $(C_2H_5)_2CO$ & $CH_3CH_2OCH_2CH_2CH_3$
(4) All the above

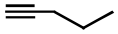
Q.11  &  are called as:
(1) Position isomers
(2) Chain isomers
(3) Functional isomers
(4) Ring chain isomers

Q.12 Possible number of disubstituted benzene isomers are:
(1) 1 (2) 2 (3) 3 (4) 4

Q.13 Which of the following are isomers:
(1) Ethanol and ethoxy ethane

(2) Methanol and methoxy methane
(3) Propanoic acid and ethyl acetate
(4) Propionaldehyde and acetone

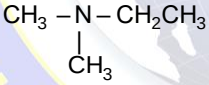
Q.14 Functional isomer of CH_3COOCH_3 is:
(1) CH_3CH_2COOH (2) $HOCH_2–CH_2CHO$
(3) $HCOOC_2H_5$ (4) Both (1) & (2)

Q.15  &  are:
(1) Chain isomer (2) Functional isomer
(3) Position isomer (4) Metamers

Q.16 CH_3CONH_2 & $HCONHCH_3$ are called:
(1) Position isomer (2) Chain isomer
(3) Metamer (4) Functional isomer

Q.17 Propene and cyclopropane are:
(1) Chain isomers
(2) Position isomers
(3) Geometrical isomers
(4) Ring chain isomers

Q.18 The number of ether metamers represented by the formula $C_4H_{10}O$ is:
(1) 4 (2) 3 (3) 2 (4) 1

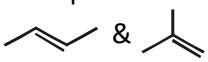
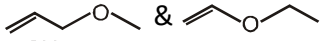
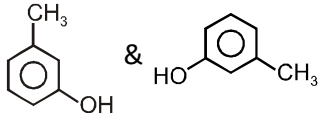
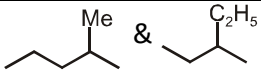
Q.19 Which of the following pairs of compounds are not metamers:
(1) $CH_3OCH_2CH_2CH_3$ and $CH_3CH_2OCH_2CH_3$
(2) $CH_3CH_2OCH_2CH_3$ and $CH_3OCH(CH_3)_2$
(3) $CH_3NHCH_2CH_2CH_3$ and $CH_3CH_2NHCH_2CH_3$
(4) $CH_3NHCH_2CH_2CH_3$ and 

Q.20 The minimum number of carbon atoms present in an organic compound to show chain isomerism are:
(1) 2 (2) 3 (3) 5 (4) 4

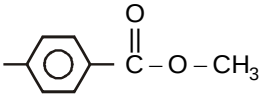
Q.21 How many chain isomers are possible for C_6H_{14}:
(1) 5 (2) 4 (3) 3 (4) 2

Q.22 How many benzenoid isomeric phenols are possible with the Molecular Formula C_7H_8O:
(1) 3 (2) 4 (3) 2 (4) 5

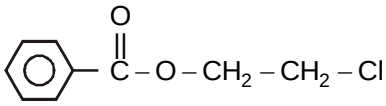
Q.23 The total number of benzene derivatives with the molecular formula $C_6H_3Cl_3$ is:
(1) 2 (2) 3 (3) 4 (4) 5

Q.24 A pair of position isomers is:
(1) 
(2) 
(3) 
(4) 

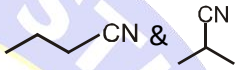
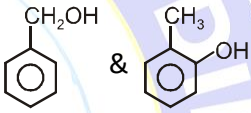
Q.25 Given compounds are



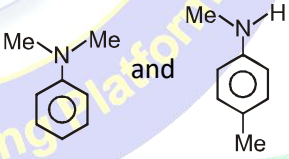
and

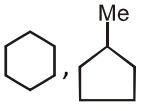


(1) Chain isomers
(2) Metamers
(3) Position isomers
(4) Ring chain isomers

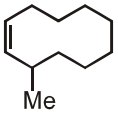
Q.26 Which is incorrect match:
(1)  : Position isomers
(2)  : Functional group isomers
(3)  : Chain isomers
(4) All

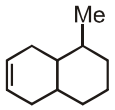
Q.27 Minimum C-atom required for:
(I) Chain isomerism in ether = X
(II) Position isomerism in alkanol = Y
(III) Functional group isomerism in Alkyne = Z
X + Y + Z is:
(1) 11 (2) 7 (3) 10 (4) 9

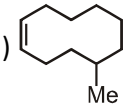
Q.28  are:
(1) Functional isomers
(2) Metamers
(3) Position isomers
(4) Chain isomers

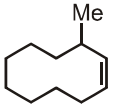
Q.29 Which is not a pair of chain isomers:
(1) 
(2) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-O-CH_3$, $CH_3–CH_2–O–CH_2–CH_3$
(3) $CH_3–CH_2–CH_2–CH_2–OH$, $CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-OH$
(4) 2 & 3 both

Q.30 Which of the following is/are structural isomers of (I)

(I) 

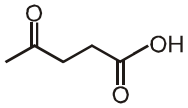
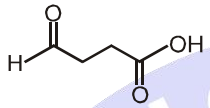
(II) 

(III) 

(IV) 

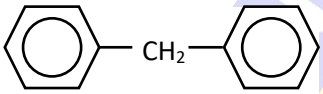
(1) II, III, IV (2) II, III

(3) III only (4) III, IV

Q.31  and  are:

(1) Homologues (2) Chain isomers

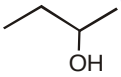
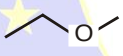
(3) Functional isomers (4) None of these

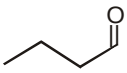
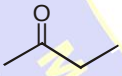
Q.32 The molecular formula of diphenylmethane,  , is $C_{13}H_{12}$;

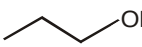
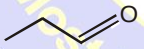
How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom?

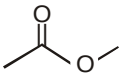
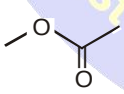
(1) 6 (2) 4 (3) 8 (4) 7

Q.33 Which of the following pairs of compounds are functional isomers?

(1)  ad 

(2)  and 

(3)  and 

(4)  and 

Q.34 $CH_3 - CH_2 - CHO$ & $CH_2 = CH - CH_2OH$ are:

(1) Functional isomers

(2) Chain isomers

(3) Position isomers

(4) Metamers

STEREO ISOMERISM

Q.35 Stereoisomers have different:

(1) Molecular formula

(2) Structural formula

(3) Configuration

(4) Molecular mass

Q.36 Which of the following compounds will not show geometrical isomerism:

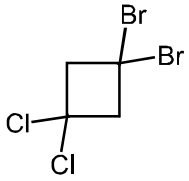
(1) Azomethane

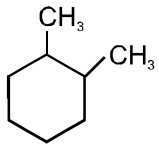
(2) 1-Bromo-2-chloroethene

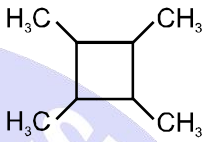
(3) 1-Phenylpropene

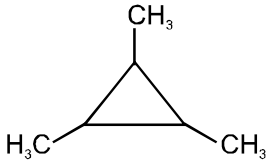
(4) 2-Methyl-2-butene

Q.37 Which of the following compound cannot show geometrical isomerism?

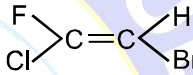
(1) 

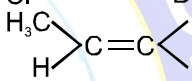
(2) 

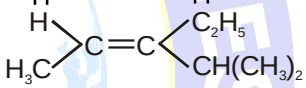
(3) 

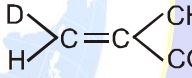
(4) 

Q.38 The 'E'-isomer is/are :

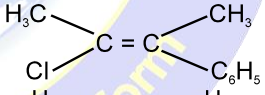
(1) 

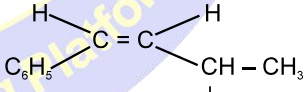
(2) 

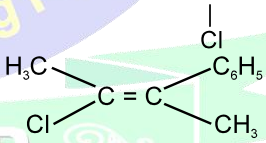
(3) 

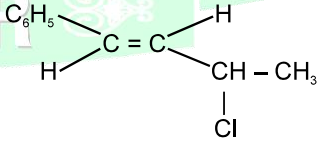
(4) 

Q.39 The correct stereochemical formula of Trans-3-chloro-1-phenylbut-1-ene is

(1) 

(2) 

(3) 

(4) 

Q.40 Chiral molecules are :

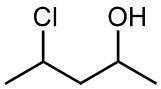
(1) Superimposable on their mirror image

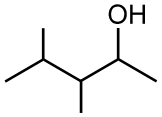
(2) Not superimposable on their mirror image

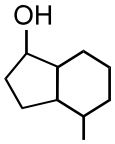
(3) unstable molecules

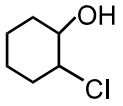
(4) capable of showing geometrical isomerism

Q.41 The compound which has maximum number of chiral centres is

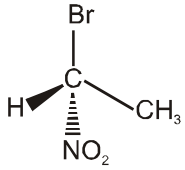
(1) 

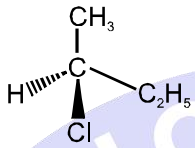
(2) 

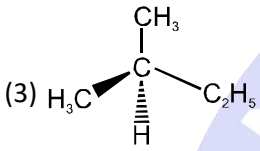
(3) 

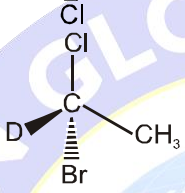
(4) 

Q.42 Which of the following compound posses plane of symmetry?

(1) 

(2) 

(3) 

(4) 

Q.43 Which of the following statements is not correct:

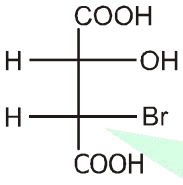
(1) Enantiomers are essentially chiral and optically active.

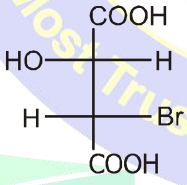
(2) Diastereomers are not necessarily chiral and optically active.

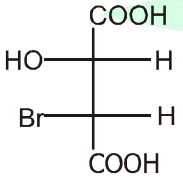
(3) All geometrical isomers are diastereomers.

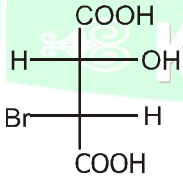
(4) All diastereomers are chiral and optically active.

Q.44 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

Q.45 Which statement is **false** :

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

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

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

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

Q.46 Which of the following is associated with Torsional strain ?

(1) Repulsion between bond pair of electrons

(2) Size of the groups present at adjacent atoms

(3) Bond angle strain

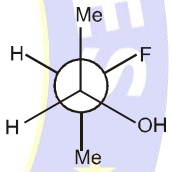
(4) Attraction of opposite charges

Q.47 The Baeyer's angle strain is expected to be maximum in

(1) Cyclodecane (2) Cyclopentane

(3) Cyclobutane (4) Cyclopropane

Q.48 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.

Q.49 Which of the following can show optical isomerism:

(1) 1-Chlorobutane (2) t-Butyl chloride

(3) Sec-butyl chloride (4) Iso-butyl chloride

Q.50 Number of oximes formed on reaction of the simplest symmetrical ketone and the simplest unsymmetrical ketone with hydroxylamine:

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

Q.51 Which of the following compound can show geometrical isomerism:

(1) $(CH_3)_2C = CH - C_2H_5$

(2) $H_2C = CBr_2$

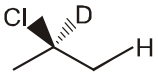
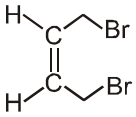
(3) $C_6H_5 - CH = CH - CH_3$

(4) $CH_3 - CH = CCl_2$

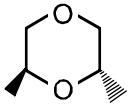
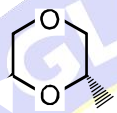
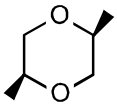
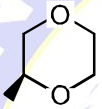
Q.52 Which of the following is not true regarding hex-2-ene:

(1) Boiling point of cis is higher than trans
(2) Trans isomer has zero dipole moment
(3) Trans is more stable than c is
(4) Can show position isomerism

Q.53 Which of the following compound can show optical isomerism:

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

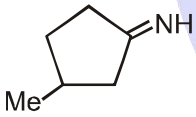
Q.54 Which of the following compound is achiral:

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

Q.55 How many stereoisomers are possible for the given compound:

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

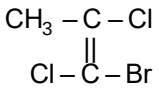
Q.56 Given compound can show:



(1) Geometrical isomerism
(2) Optical isomerism
(3) Geometrical and optical isomerism both
(4) None

Q.57 But-2-ene exhibits cis-trans isomerism due to:
(1) Rotation around C_3–C_4 sigma bond
(2) Restricted rotation around C=C bond
(3) Rotation around C_1–C_2 bond
(4) Rotation around C_2–C= double bond

Q.58 The number of geometrical isomers of $CH_3CH = CH–CH = CH–CH = CHCl$ are:
(1) 2 (2) 4 (3) 6 (4) 8

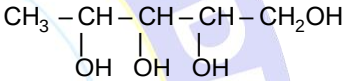
Q.59  has the configuration:

(1) Trans (2) Z
(3) E (4) Both (1) & (2)

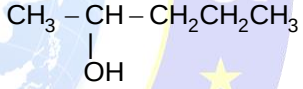
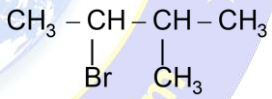
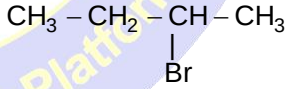
Q.60 Which of the following will show geometrical isomerism:
(1) 1-Butene
(2) 1, 2-Dibromoethene
(3) Propene
(4) Isobutylene

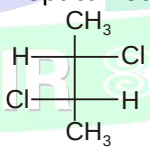
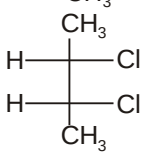
Q.61 How many asymmetric carbon atoms are present in:
(i) 1, 2-dimethyl cyclohexane
(ii) 3-methyl cyclopentene
(iii) 3-methyl cyclohexene
(1) Two, one, one (2) One, one, one
(3) Two, none, two (4) Two, none, one

Q.62 Stereo isomers but not mirror images are called:
(1) Enantiomers (2) Mesomers
(3) Tautomers (4) Diastereomers

Q.63 The number of optically active isomers possible in  are:

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

Q.64 Which of the following contain chiral carbon atom:
(1) 
(2) 
(3) 
(4) All the above

Q.65 If optical rotation produced by  is +36° then that produced by  is:

(1) –36° (2) 0°
(3) +36° (4) Unpredictable

Q.66 Number of optically active isomers of tartaric acid is:
(1) 3 (2) 1 (3) 4 (4) 5

Q.67 Meso form of tartaric acid is:

(1) Dextorotatory
(2) Laevorotatory
(3) Neither Leavo nor dextro rotatory due to internal compensation
(4) A mixture of equal quantities of dextro and leavo rotatory forms

Q.68 Molecular formulae 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) $CH_3CH_2CH_2CH_2OH$
(4) $CH_3CH(OH)CH_2CH_3$

Q.69 $CH_3 - CH_2 - CH_2 - CH_3$. There is free rotation about ($C_2 - C_3$) bond. The same most stable form is repeated after rotation of:
(1) 60° (2) 120° (3) 240° (4) 360°

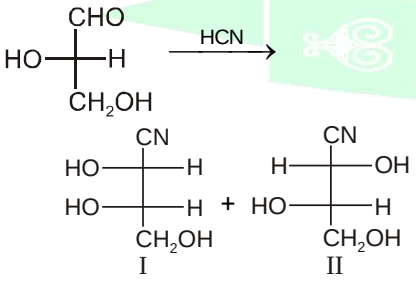
Q.70 The eclipsed and staggered conformation of ethane is due to:
(1) Free rotation about C–C single bond
(2) Restricted rotation about C–C single bond
(3) Absence of rotation about C–C bond
(4) None of the above

Q.71 Dihedral angle require to get maximum stable conformer from minimum stable conformer in n-butane is:
(1) 360° (2) 180° (3) 120° (4) 240°

Q.72 The number of isomers for the compound with molecular formula $C_2BrClFI$ is:
(1) 3 (2) 4 (3) 5 (4) 6

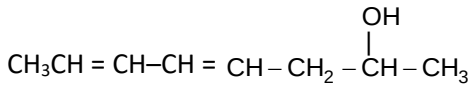
Q.73 Which of the following does not contain any asymmetric carbon but can show enantiomerism:
(1) Lactic acid (2) 1, 3-pentadiene
(3) Tartaric acid (4) 2, 3-pentadiene

Q.74



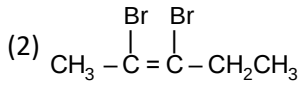
Compound I and II are:
(1) Diastereomers (2) Identical
(3) Mesomers (4) Enantiomers

Q.75 The number of stereo isomers possible for the compound with the structure is:



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

Q.76 Which of the following will show geometrical isomerism:
(1) $CH_3CH = CH_2$
(2)



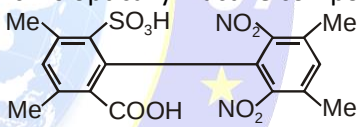
(3) $CH_3CH_2CH_2CH = CH_2$
(4) $CH_2 = CH–CH_2–CH_3$

Q.77 How many optically active isomers are possible for a compound of given formula:
$CH_2OH \cdot CHOH \cdot CHOH \cdot CHOH \cdot CH_2OH$
(1) 2 (2) 3
(3) 4 (4) 8

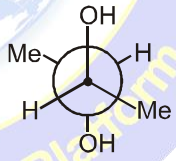
Q.78 In trans-1, 2-dichloroethene:
(1) There are 6 sigma bonds
(2) There is free rotation about the C–C bond
(3) All the atoms lie in the same plane
(4) All the above

Q.79 Which is optically inactive compound:

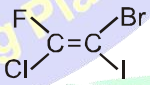
(a)



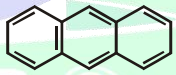
(b)



(c)



(d)

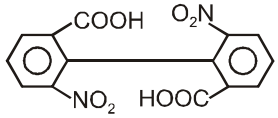


(e)

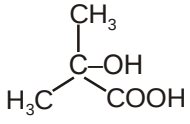
(1) b, c, d (2) a, b, d, e
(3) a, b, c, d (4) Only e

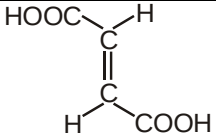
Q.80 Which compound would exhibit optical isomers:

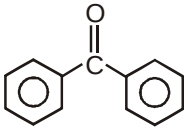
(1)



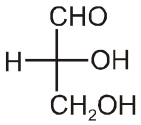
(2)

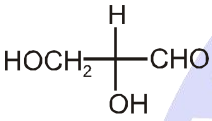


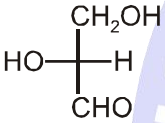
(3) 

(4) 

Q.81 In plane clockwise rotation of the projection formula (A) of a compound by 90° and 180° yields the projection formulae (B) and (C) respectively:

A. 

B. 

C. 

Which of the following statements is not correct about (A), (B) and (C):

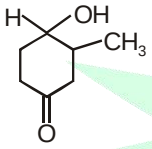
(1) A and B are enantiomers

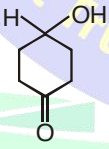
(2) A and C are identical

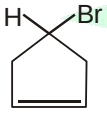
(3) B and C are enantiomers

(4) A and C are enantiomers

Q.82 Which of the following compounds possesses chiral centre:

(1) 

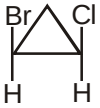
(2) 

(3) 

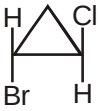
(4) 

Q.83 Which of the following compounds is a meso compound:

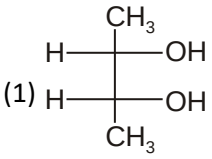
(1) 

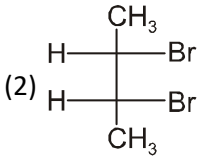
(2) 

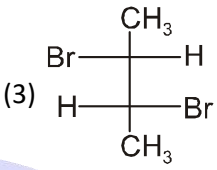
(3) 

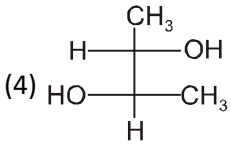
(4) 

Q.84 Which of the following structures represents a threo-stereoisomer:

(1) 

(2) 

(3) 

(4) 

Q.85 How many meso stereoisomers are possible for 2, 3, 4-pentanetriol:

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

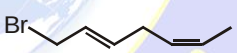
Q.86 Among the following compounds, the one which can exhibit geometrical isomerism is:

(1) 1, 3-butadiene (2) 1, 2-butadiene

(3) 1, 3-pentadiene (4) 1, 4-pentadiene

Q.87 The total number of secondary alcohols (including stereoisomers) possible having the molecular formula $C_5H_{12}O$ is:

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

Q.88 The correct IUPAC name of  is:

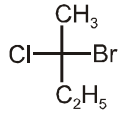
(1) 7-bromo-2Z, 5E-heptadiene

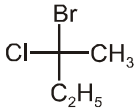
(2) 1-bromo-2Z, 5E-heptadiene

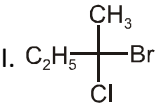
(3) 1-bromo-2Z, 5Z-heptadiene

(4) 1-bromo-2E, 5Z-heptadiene

Q.89 The interchange of two groups (Br and CH_3) at the chiral centre of the projection formula (I) yields the formula (II), while the interchange of another set of two groups (C_2H_5 and Cl) of (I) yields the projection formula (III).

I. 

II. 

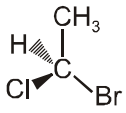
III. 

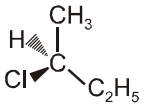
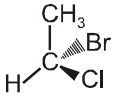
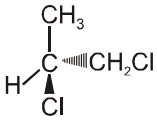
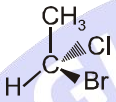
Which of the following statements is not correct about the structures (I), (II) and (III):

(1) (II) and (III) are identical

(2) (I) and (III) are enantiomers
(3) (II) and (III) are enantiomers
(4) (I) and (II) are enantiomers

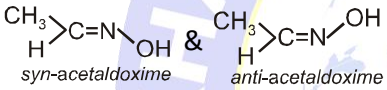
Q.90 Which of the following is the enantiomer of the structure?

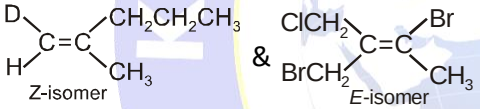


(1) 
(2) 
(3) 
(4) 

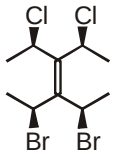
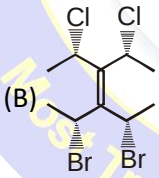
Q.91 In which of the following pair of compound shows correct configuration:

(1) 
syn-azobenzene & anti-azobenzene

(2) 
syn-acetaldoxime & *anti*-acetaldoxime

(3) 
Z-isomer & *E*-isomer

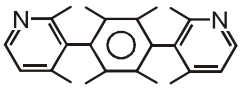
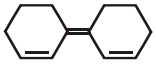
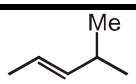
(4) All of these

Q.92 (A) 
(B) 

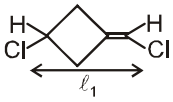
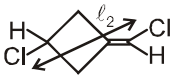
Relationship between above pair (A) & (B) is:
(1) Enantiomers (2) Diastereomers
(3) Identical (4) Structural isomers

Q.93 Correct statement is:
(1) Isomers have same molecular formula but different structural formula
(2) Isomers have same physical but different chemical properties.
(3) Stereoisomers belong to same homologous series.
(4) All

Q.94 Which of the following can show geometrical isomerism:

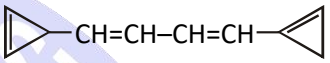
(1) 
(2) 
(3) 
(4) All

Q.95 Which of the following is true for aerial distances 1 and 2:

(I) 
(II) 

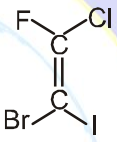
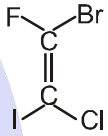
(1) $\ell_1 > \ell_2$ (2) $\ell_2 > \ell_1$
(3) $\ell_1 = \ell_2$ (4) Cannot be compared

Q.96 Number of geometrical isomers possible for the compound:



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

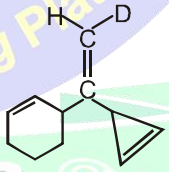
Q.97 Which is incorrect statement:

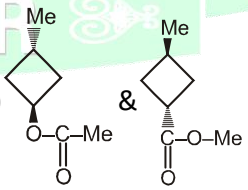
(I) 
(II) 

(1) I has Z configuration
(2) II has E configuration
(3) I & II are geometrical isomers of each other
(4) None

Q.98 Which of the following can have meso isomer:
(1) 3-chloro-2, 4-dimethylpentane
(2) Pentane-2, 3-diol
(3) Cyclopentane-1, 2-diamine
(4) 2-Chlorobutane

Q.99 Which is incorrect match:

(1)  : E-configuration

(2)  :Geometrical isomers

(3) Total alkene with M.F. C_4H_8 : 3
(4) All

Q.100 How many geometrical isomers are possible with the molecular formula C_5H_{10} in cyclic form:
(1) 10 (2) 2 (3) 4 (4) 6

Q.101 Number of structural isomeric aldehyde and ketones possible with the M.F. $C_5H_{10}O$, which on reaction with hydroxyl amine give two oximes:
(1) 4 (2) 7 (3) 6 (4) 5

Q.102 An alcohol, an aldehyde and a carboxylic acid of comparable mass will have their boiling points in the order:
(1) Alcohol < Aldehyde < Carboxylic acid
(2) Aldehyde < Alcohol < Carboxylic acid
(3) Alcohol < Carboxylic acid < Aldehyde
(4) Carboxylic acid < Aldehyde < Alcohol

Q.103 How many cyclic geometrical isomers are possible with the M.F. C_6H_{12}:
(1) 4 (2) 6 (3) 8 (4) 10

Q.104 The decreasing order of boiling points of the following is:
I. RCOCl II. $(RCO)_2O$
III. $RCONH_2$ IV. RCOOR
(1) I > IV > II > III (2) III > II > IV > I
(3) IV > III > I > III (4) II > I > III > IV

ANSWER KEY

TOPIC WISE QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	1	2	1	2	3	2	2	4	1	1	3	4	4	2
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	4	4	2	4	4	1	1	2	4	2	4	1	1	4	3
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	4	2	2	1	3	4	1	4	4	2	3	3	4	1	4
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	1	4	2	3	3	3	2	1	2	2	3	2	4	4	2
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	1	4	4	4	2	1	3	4	4	1	2	4	4	1	4
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	2	1	3	3	1	4	1	3	3	2	3	3	4	3	4
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	
Ans.	4	3	3	4	3	1	3	3	4	3	2	2	3	2	