CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

ISOMERISM

LECTURE SHEET (Structural Isomerism) (EXERCISE-1) LEVEL-I (MAIN) Straight Objective Type Questions

1. Which of the following exhibits chain isomerism?

A. $CH_3CH_2NH_2$

B. $CH \equiv C - CH_2CH_3$

C. $CH_2CH_2CH_2OH$

D. $CH \equiv C - CH_2CH_2CH_3$

Answer: D

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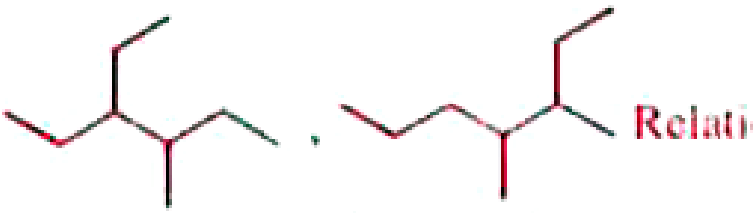
2. 

Relation between the above compounds:

A. Position isomers

B. Chain isomers

C. Homologs

D. No relation

Answer: B

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3. Which pair of isomers given below are positional isomers

A. Propanal and propanone

B. 1° Butyl alcohol and Isobutyl alcohol

C. 3° butyl alcohol and Isobutyl alcohol

D. 2° Butyl alcohol and 3° Butyl alcohol

Answer: C

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4. A Satellite is in an elliptic orbit around the earth with aphelion of 6R and perihelion of 2R

A. Position isomerism

B. Chain isomerism

C. Tautomerism

D. Geometrical isomerism

Answer: A

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5. The compounds $C_2H_5OC_2H_5$ and $CH_3OCH_2CH_2CH_3$ are

A. chain isomers

B. geometrical isomers

C. metamers

D. conformational isomers

Answer: C

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6. Number of structural isomers which can be obtained theoretically on monochlorination of 2-methylbutane is

A. 1

B. 2

C. 3

D. 4

Answer: D

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7. Find the number of dibromo derivatives of molecular formula $C_3H_6Br_2$ is

A. 4

B. 2

C. 6

D. 8

Answer: A

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8. C_7H_7Cl shows how many benzenoid aromatic isomers ?

A. 4

B. 3

C. 5

D. 6

Answer: A

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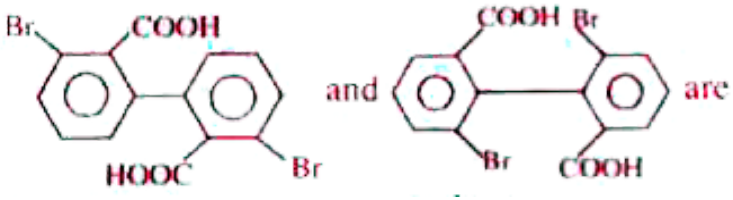
9. Which statement is true



A. Positional

B. Chain

C. Geometrical

D. Functional

Answer: A

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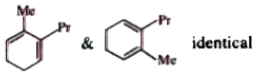
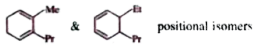
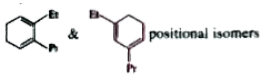
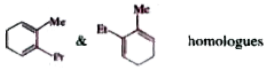
10. Which of the following has incorrect relation

A. 

B. 

C. 

D. 

Answer: B

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11. The number of primary alcohol isomers with the formula $C_4H_{10}O$ is

A. 1

B. 2

C. 3

D. 4

Answer: B

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12. The number of structural isomers obtained by mono-halogenation of propane is

A. two

B. three

C. four

D. five

Answer: A

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13. Which of the following statements regarding compounds having molecular C_5H_8 is right

A. It can be an open chain compound having one double bond

B. It can be an open chain compounds with two double bonds

C. It can be a saturated cyclic compound

D. It can be unsaturated bicyclic compound

Answer: B

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14. The number of isomers of the aromatic compound C_8H_{10} are :

A. 3

B. 4

C. 2

D. 5

Answer: B

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LECTURE SHEET (Structural Isomerism) (EXERCISE-1) LEVEL-II (ADVANCED) Straight Objective Type Questions

1. The total number of isomers (containing benzene ring) of molecular formula C_7H_8O is :

A. 2

B. 3

C. 4

D. 5

Answer: D

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2. $\underset{(x)}{C_6H_4}\underset{(\text{doclorobenzeme})}{}Cl_2 + \underset{(y)}{Cl_2} \xrightarrow{Fe} C_6H_3Cl_3$ Only one structural isomer of Y is formed. Hence, (X) is.

A. o - isomer

B. p- isomer

C. m -isomer

D. Any of these

Answer: B

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3. The number of isomeric primary amines possible for the formula C_3H_9N

A. 2

B. 3

C. 5

D. 6

Answer: A

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4. The total number of structural isomers possible for hydrocarbon C_5H_{10} is:

A. 9

B. 10

C. 11

D. 12

Answer: B

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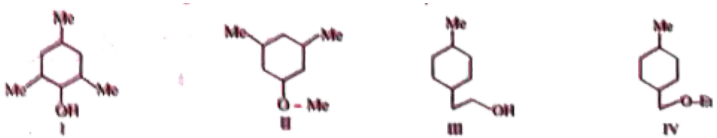
5. Which of the following is not the correct relationship



a) II & IV are metamer
b) I & II are functional isomer
c) I & III are chain isomer
d) I and IV are positional isomer

A. II & IV are metamer

B. I & III are chain isomer

C. I & II are functional isomer

D. I and IV are positional isomer

Answer: D

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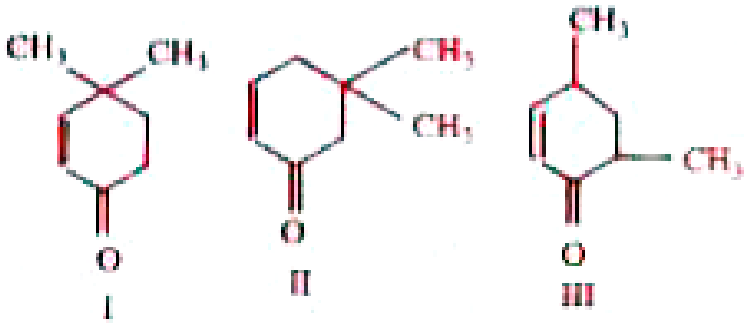
6.



Which among these can exhibit tautomerism?

A. I and II

B. I and III

C. II and III

D. all

Answer: D

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7. Which of the following molecules contain more enol content at equilibrium

A. $OHC - CH_2 - CHO$

B. $CH_3COCH_2COOCH_3$

C. $CH_2(COOH)_2$

D. CH_3COCH_3

Answer: A

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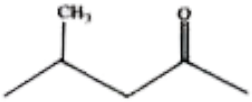
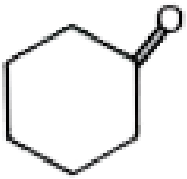
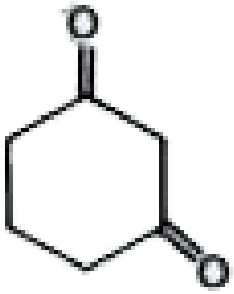
8. Which of the following contains maximum enol form ?

A.



B.





C.

D.

Answer: C

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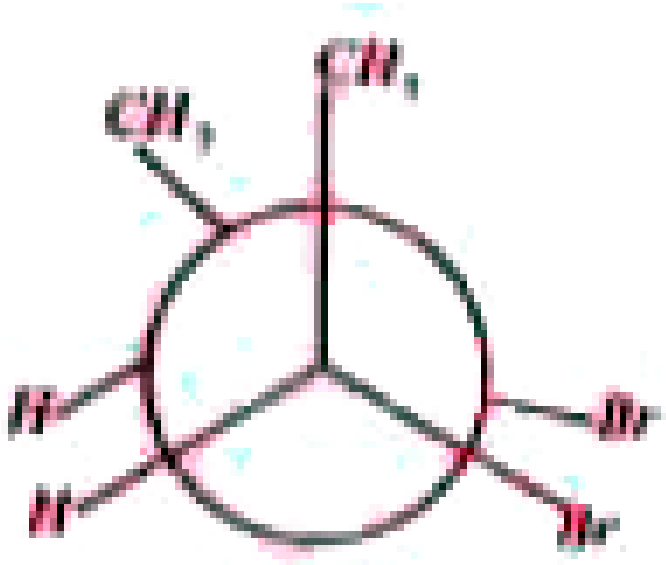
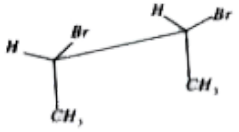
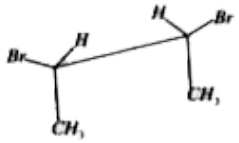
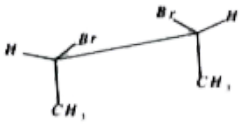


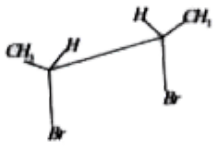
9.

Translating this eclipsed Newman projection formula of 2, 3 dibromobutane into eclipsed sawhorse projection appears as

A. 

B. 

C. 

D. 

Answer: A

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10. Choose the correct enol content order of the following compounds in their pure liquid state

I) CH_3COCH_3 II) $CH_3COCH_2COOC_2H_5$ III) $C_6H_5COCH_2COOC_2H_5$

IV) $CH_3COCH_2COCH_3$ V) $C_6H_5COCH_2COCH_3$

A. II $>$ III $>$ IV $>$ I $>$ V

B. III $>$ II $>$ I $>$ V $>$ IV

C. V $>$ IV $>$ III $>$ II $>$ I

D. V $>$ III $>$ IV $>$ II $>$ I

Answer: C

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LECTURE SHEET (Structural Isomerism) (EXERCISE-1) LEVEL-II (ADVANCED)

More than one correct answer Type Questions

1. The formula $C_4H_{11}N$ represents

A. Four p-amines

B. three s-amines

C. two s-amines

D. one t-amine

Answer: A::B::D

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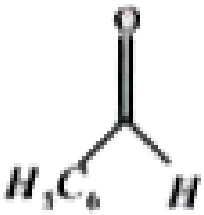
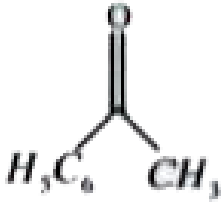
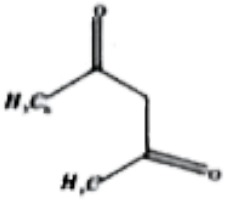
2. keto-enol tautomerism is observed in

A. 

B. 

C. 

D. 

Answer: B::D

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3. Only two isomeric mono chloro derivatives are possible for

A. n-butane

B. 2,3-dimethylbutane

C. benzene

D. 2-methyl propane

Answer: A::B::D

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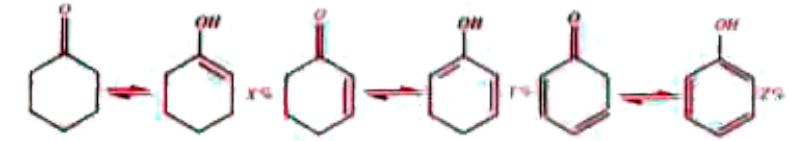
LECTURE SHEET (Structural Isomerism) (EXERCISE-1) LEVEL-II (ADVANCED) Linked Comprehension Type Questions

1. Tautomerism is the phenomenon in which two structural isomers differing in the relative position of their atoms are spontaneously interconvertible and can exist in dynamicequilibrium.

$$CH_3 - \underset{(I)}{\overset{O}{\overset{||}{C}}} - CH_3 \Leftrightarrow CH_3 - \underset{(II)}{\overset{OH}{\overset{|}{C}}} = CH_2$$

Tautomers I and II are structural isomers that are related only by the shift of a hydrogen atom an one or more Pi bond.



The relation between the enol contents X, Y, Z should be

A. $X > Y > Z$

B. $Z > Y > X$

C. $Y > X > Z$

D. $Y > Z >$

Answer: B

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2. Tautomerism is the phenomenon in which two structural isomers differing in the relative position of their atoms are spontaneously interconvertible and can exist in dynamicequilibrium.

$$CH_3 - \underset{(I)}{\overset{O}{\overset{||}{C}}} - CH_3 \Leftrightarrow CH_3 - \underset{(II)}{\overset{OH}{\overset{|}{C}}} = CH_2$$

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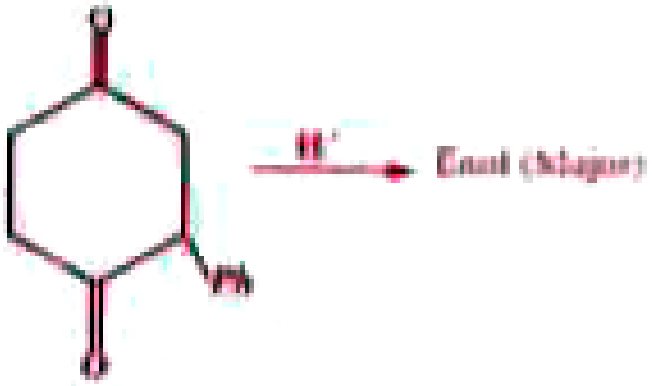
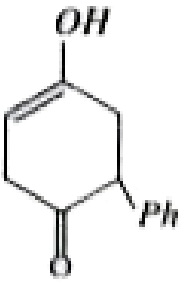
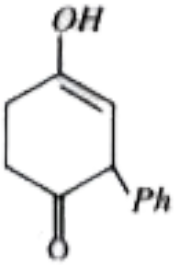


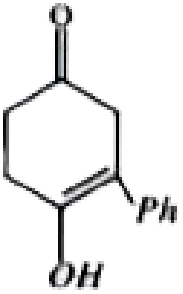


A.

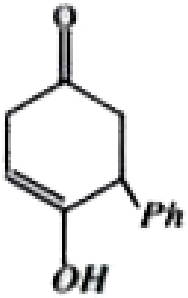


B.

C.



D.



Answer: C

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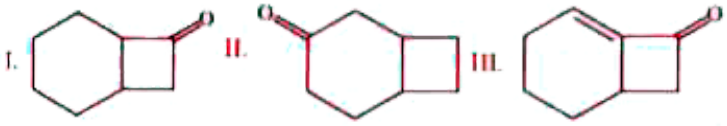
3. Tautomerism is the phenomenon in which two structural isomers differing in the relative position of their atoms are spontaneously interconvertible and can exist in dynamicequilibrium.

$$CH_3 - \underset{(I)}{\overset{O}{\overset{||}{C}}} - CH_3 \Leftrightarrow CH_3 - \underset{(II)}{\overset{OH}{\overset{|}{C}}} = CH_2$$

Tautomers I and II are structural isomers that are related only by the shift of a hydrogen atom an one or more Pi bond.



Among these compounds, the order of enol contents should be

A. I $>$ II $>$ III

B. III $>$ II $>$ I

C. III $>$ I $>$ II

D. II $>$ III $>$ I

Answer: C

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LECTURE SHEET (Structural Isomerism) (EXERCISE-1) LEVEL-II (ADVANCED) Integer Type Questions

1. Number of six membered cyclic conjugated dienes possible for C_6H_8 is

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2. The minimum number of carbon atoms to be present in an alkyne to exhibit chain isomerism is

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3. Number of positional isomers possible for methyloctane

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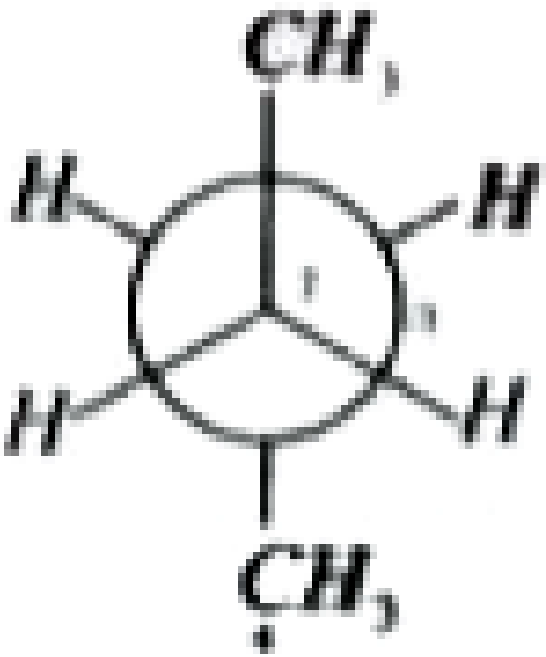
LECTURE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-I (MAIN) Straight Objective Type Questions

1. In the given conformation C_2 is rotated about $C_2 - C_3$ bond by 120°, then the conformation formed will be



A. fully eclipsed

B. partially eclipsed

C. gauche

D. staggered

Answer: C

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2. The number of conformational isomers possible of n-butane about $C_2 - C_3$ bond

A. One

B. Four

C. Three

D. Infinite

Answer: D

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3. Which of the following is correct regarding stability of conformations of n-butane about $C_2 - C$ bond

Anti (I) gauche (II) partially eclipsed (III) fülly eclipsed (IV)

A. I $>$ II $>$ III $>$ IV

B. I $>$ II $>$ IV $>$ III

C. IV > III > II > I

D. IV > II > I > III

Answer: A

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4. Which of the following is the most stable conformer of 1, 2, 4 -trimethyl cyclohexane

A. 

B. 

C. 

D. 

Answer: A

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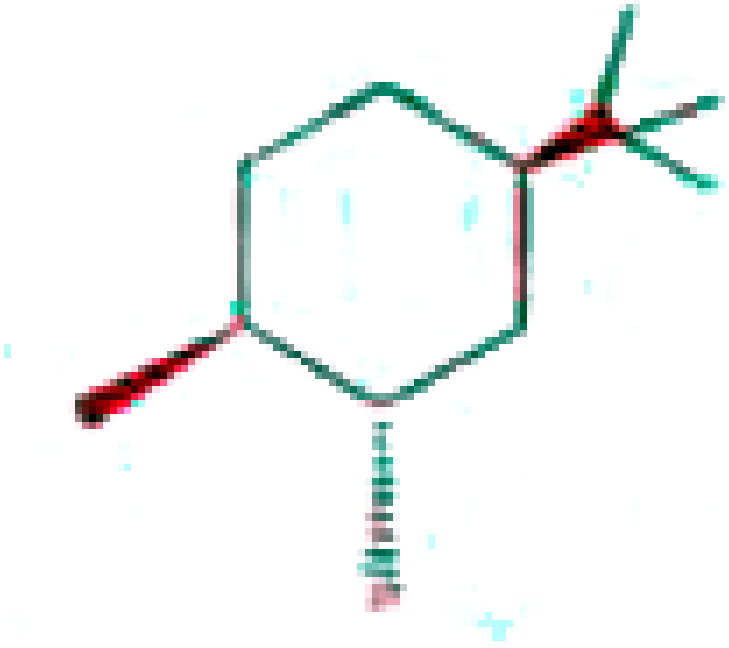
5. Choose the stable form of the compound given below in chair conformation



A. 

B. 

C. 

D. 

Answer: B

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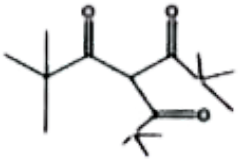
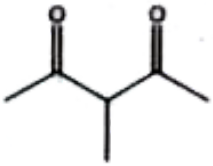
6. The one with maximum enol content is

A. 

B. 

C. 

D. 

Answer: A

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7. Geometrical isomerism is possible about which of the following multiple bonds?

A. C = N

B. N = N

C. C = C

D. all of these

Answer: D

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8. Which of the following possess highest melting point

A. cis-2-butene

B. trans-2-butene

C. Isobutene

D. 1-butene

Answer: B

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9. Number of possible geometrical isomers for 2, 4 - hexadjenie is

A. 8

B. 4

C. 3

D. 2

Answer: B

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10. Which of the following statements is right regarding geometrical isomers

A. All cis-isomers must be Z-isomers

B. All trans-isomers must be E-isomers

C. A cis-isomer can be either Zor E

D. None of the above is correct

Answer: C

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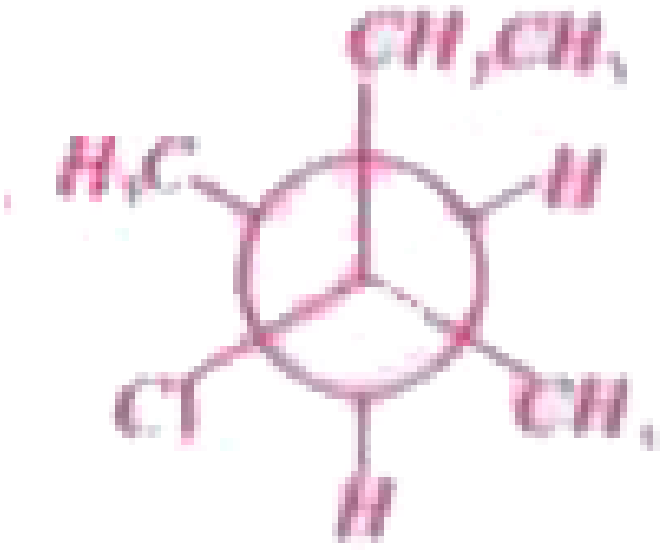
11. The IUPAC name of the compound given is



A. 2-chloro-4-methylphentane

B. 3-chloro-3-methylpentane

C. 3-chloro-4-methylpentane

D. 2-chloro-3-methylpentane

Answer: B

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12.

Which of the following order of stability is correct among these two isomers ?

A. I = II

B. I $>$ II

C. II $>$ I

D. cannot be predicted

Answer: C

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LECTURE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Straight Objective Type Questions

1. Which of the following does not show geometrical isomerism?

A. 1, 2 - dichloro - 1 - pentene

B. 1, 3 - dichloro - 2 - pentene

C. 1, 1 - dichloro - 1 - pentene

D. 1, 4 - dichloro - 2 - pentene

Answer: C

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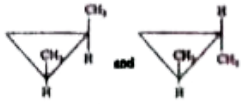
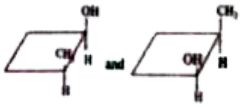
2. Identify the pair of isomers which are geometrical isomers of each.

A. 

B. 

C. $CH_2 = CH = CH_2$ & $CH_3 - CH = CH_2$

D. $CH_3 - CH = CH - CH_3$ & $CH_2 = CH - CH_2CH_3$

Answer: A

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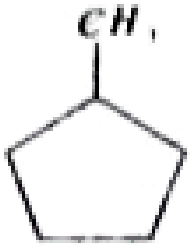
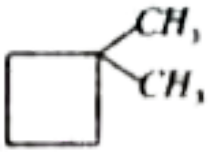
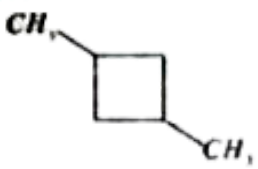
3. Which of the following cycloalkanes will show cis-trans isomerisin?

A. 

B. 

C. 

D. All the above

Answer: C

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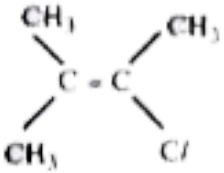
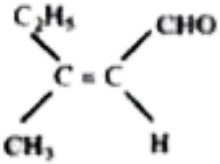
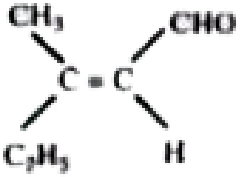
4. Which of the following compounds is Z-isomer

A. 

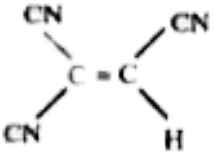
B.



C.



D.



Answer: B

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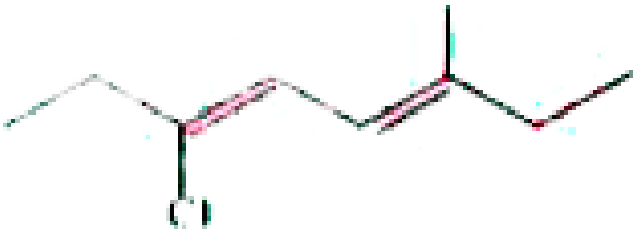
5. 

This compound is named in IUPAC as

A. 3-chloro-6-methyl-(3E,5Z)-octadiene

B. 3-chloro-6-methyl-(32,5E)-octadiene

C. 3-chloro-6-methyl-(32,5Z)-octadienė

D. 3-chloro-6-methyl-(3E,5E)-octadiene

Answer: B

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6. $CH_2 = CH - CH = CH - CH = CH - CH_3$ How many geometrical isomers of this compound are possible?

A. 2

B. 3

C. 4

D. 8

Answer: C

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7.

How many geometrical isomers of this compound are possible?

A. 0

B. 2

C. 3

D. 4

Answer: A

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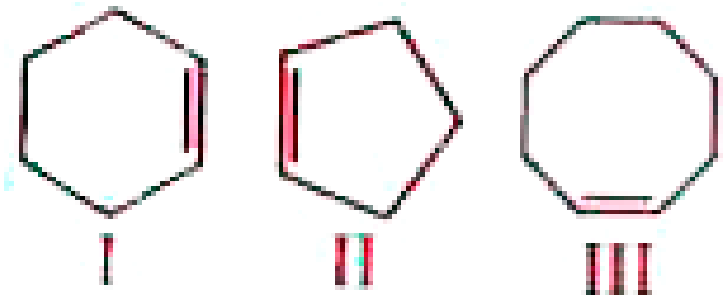
8.



Which of the cycloalkenes is likely of exhibit geometrical isomerism?

A. I

B. II

C. III

D. all of these

Answer: C

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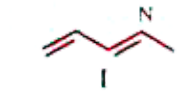
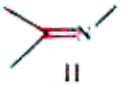
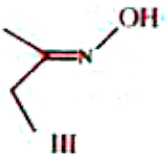
9. Which of these compounds are likely to exhibit geometrical isomerism



I



II



III

A. I

B. II

C. III

D. I and III

Answer: D

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LECTURE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) More than one correct answer Type Questions

1. Which of the following have zero dipole moment?

A. trans-2,3-dichloro-2-butene

B. cis-2,3-dichloro-2-butene:

C. trans-3-hexene

D. cís-2-pentene

Answer: A::C

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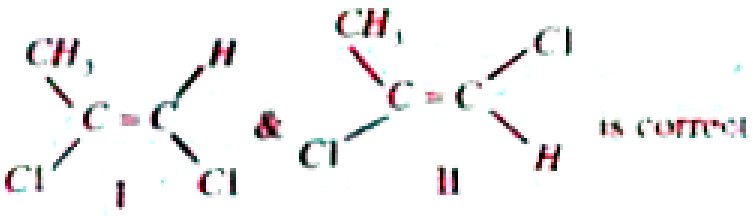
2. Which of the following statements regarding



is correct

is correct

A. I & I are geometrical isomers

B. Both I & II possess dipole moment

C. I is Z isomer

D. II is trans isomier

Answer: A::B::C::D

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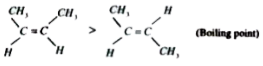
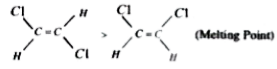
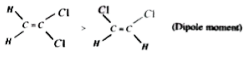
3. Which of the following is correct

A.  (Boiling point)

B.  (Melting Point)

C.  (Dipole moment)

D. $CH_3C \equiv \mathrm{CCH_3} > CH_3CH_2C - CH$ (Dipole moment)

Answer: A::B::C

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LECTURE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Linked Comprehension Type Questions

1. Stereoisomers, which can be interconverted simply by rotation about sigma bonds, are conformational isomers while those, which can be converted only by breaking and remaking of bonds and not simply by rotation, are called configurational isomers.

The angle between C-C and C – H bonds on adjacent carbon atoms in any conformation is called dihedral angle.

The cyclic compounds most commonly found in nature containing six membered rings can exist in a conformation that is almost completely free of strain. The most stable conformation of cyclohexane is chair form.

According to Bayer strain theory, the greater deviation from the normal tetrahedral angle, greater is the angle strain or torsional strain and

hence lesser is the stability of the cycloalkane.

Dihedral angle in staggered (gauche) and eclipsed conformation are:

A. 60° and 0°

B. 0° and 60°

C. $60^\circ, 120^\circ$

D. $120^\circ, 60^\circ$

Answer: A

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2. Stereoisomers, which can be interconverted simply by rotation about sigma bonds, are conformational isomers while those, which can be converted only by breaking and remaking of bonds and not simply by rotation, are called configurational isomers.

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membered rings can exist in a conformation that is almost completely free of strain. The most stable conformation of cyclohexane is chair form. According to Bayer strain theory, the greater deviation from the normal tetrahedral angle, greater is the angle strain or torsional strain and hence lesser is the stability of the cycloalkane.

Dihedral angle between two methyl groups of n-butane in the gauche and anti forms are :

A. $60^\circ, 0^\circ$

B. $60^\circ, 180^\circ$

C. $0^\circ, 60^\circ$

D. $180^\circ, 60^\circ$

Answer: B

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3. Stereoisomers, which can be interconverted simply by rotation about sigma bonds, are conformational isomers while those, which can be

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According to Bayer strain theory, the greater deviation from the normal tetrahedral angle, greater is the angle strain or torsional strain and hence lesser is the stability of the cycloalkane.

Which among the following conformation of cyclohexane is the most stable form ?

A. Chair form

B. Half chair forms

C. Twist boat form

D. Boat form

Answer: A

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4. How many of the following statements are correct?

1) The most stable conformer of cis-1, 3-cyclohexanediol is chair form.

2) Cis- 1, 3- cyclohexanediol is more stable than trans -1, 3-cyclohexanediol.

3) In Cis 1, 3-cyclohexanediol both the OH groups occupy equitorial positions.

4) The most stable conformer of trans -1, 4-cyclohexanediol is chair form.

5) The most stable conformer of cis-1, 4-cyclohexanediol is boat conformer.

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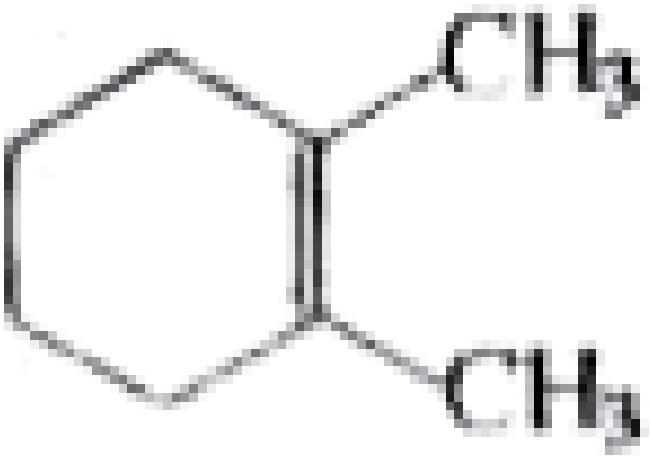

5.

The possible number of geometrical isomers for this compound which can be isolated at room temperature is

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LECTURE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Integer Type Questions

1. $CH_3 - CH = \underset{\underset{Br}{|}}{C} - \underset{\underset{Cl}{|}}{C} = CH - CH_3$ Number of geometrical isomers possible for this compound are

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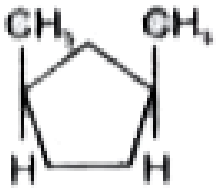
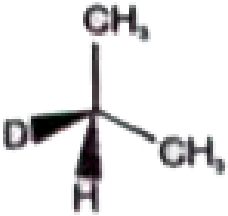
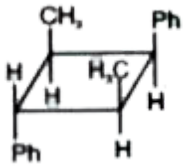
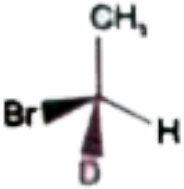
LECTURE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-I (MAIN) Straight Objective Type Questions

1. Which species does not exhibit a plane of symmertry ?

A. 

B. 

C. 



D.

Answer: D

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2. (A): $CH_3CH(OH)COOH$ is optically active

(R) : $CH_3CH(OH)COOH$ do not possess any element of symmetry.

The correct answer is

A. Both A and R are true and R explains A

B. Both A and R are true and R does not explains A

C. A is true, R is flase

D. A is false, R is true

Answer: A

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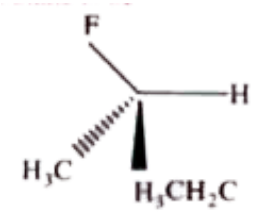
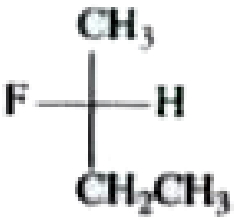
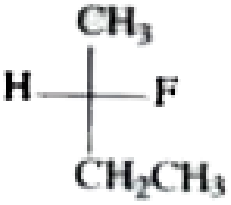
3. The structure of (S)-2-fluorobutane is best represented by :

A. $CH_3\overset{F}{\overset{|}{C}}HCH_2CH_3$

B. 

C. 

D. 

Answer: C

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4. The horizontal bonds in Fischer projection respresents the bond in the three dimension for

A. Both below the plane of paper

B. Both above the plane of paper

C. Both on the plane of paper

D. One above and another below the plane of paper

Answer: B

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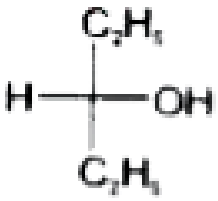
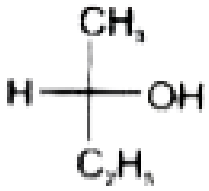
5. Which of the following is the structure of (S)-Pentan-2-ol is ?

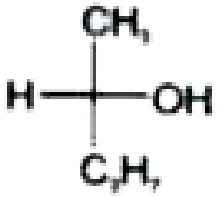
A.



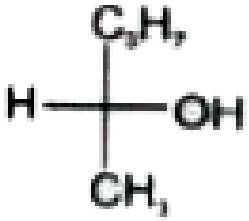
B.



C.



D.



Answer: C

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6. Optically active among the following is

A. Meso tartaric acid

B. dl - tartaric acid

C. Meso - 2, 3- butanediol

D. Erythro - 2, 3 - dihydroxy butanoic acid

Answer: D

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7. Which statement is true of 1,3-dimethylcyclobutane?

A. Only one form of the compound is possible

B. Two diastereomeric forms are possible

C. Two sets of enantiomers are possible

D. Two enantiomeric forms and one meso compound are possible

Answer: B

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8. Number of stereoisomers possible for $BrCH_2CHClCH_2CHClCH_2Br$

A. Two

B. Three

C. Four

D. Six

Answer: B

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9. Which of the following molecules is achiral?

A. (2R, 3R) - 2,3-Dichloropentane

B. (2R, 3S) - 2,3-Dichloropentane

C. (2S, 4S) - 2,4-Dichloropentane

D. (2S, 4R) - 2,4-Dichloropentane

Answer: D

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10. Which is, a meso compound?

A. (2R, 3R) - 2,3-Dibromobutane

B. (2R,3S)-2,3-Dibromopentane

C. (2R, 4R)- 2,4-Dibromopentane

D. (2R, 4S) -2,4-Dibromopentane

Answer: D

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1. What is the percent composition of a mixture of $(S)-(+)-2-$ butanol, $[\pm]\frac{25}{D}=+13.52^0$, and $(R)-(-)-2-$ butanol, $[\pm]\frac{25}{D}=-13.52^0$, with a specific rotation $[\pm]\frac{25}{D}=+6.76^0$?

A. 75%(R) 25%(S)

B. 25%(R) 75%(S)

C. 50%(R) 50%(S)

D. 67%(R) 33%(S)

Answer: A

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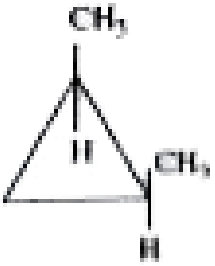
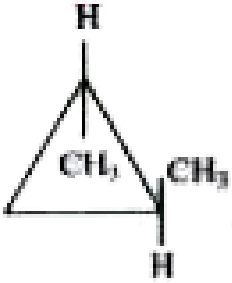
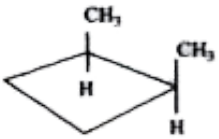
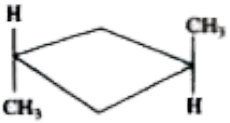
2. Which of the following molecule is optically active

A. 

B. 

C. 

D. 

Answer: B

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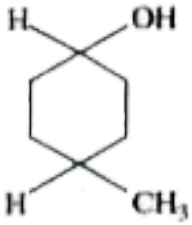
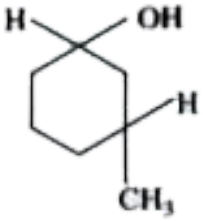
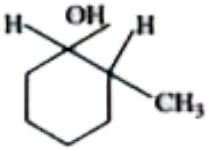
3. Which of the following niolecule does not contain chiral centre (s)

A. 

B. 

C. 

D. All the above

Answer: A

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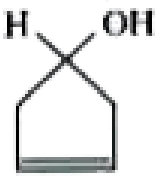
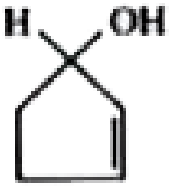
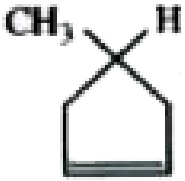
4. Which of the following is a chiral molecule

A. 

B. 

C. 

D. All the above

Answer: B

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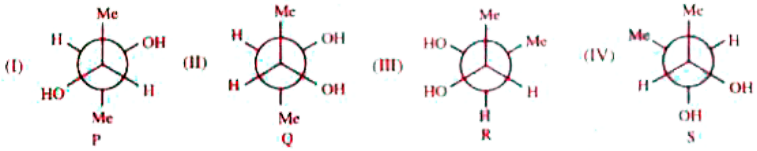
5. Among the following, the Newmann projection formula of meso-2, 3-butanediol are / is



A. I, II

B. I, III

C. II, IV, III

D. IV, II, IV

Answer: B

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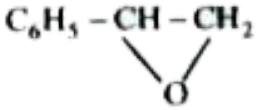
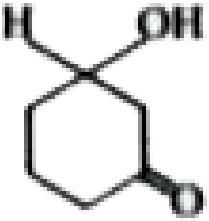
6. Which one of the compound is achiral :

A. 

B. $CH_3 - CH_2 - CHOHCN$

C. 

D. 

Answer: D

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LECTURE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-II (ADVANCED) More than one correct answer Type Questions

LIST - 1 (Radical)	LIST - 2 (Formula)
A)Vinyl	1) C_6H_5-
B)Allyl	2) $CH_2 = CH-$
C)Propenyl	3) $CH_3-CH_2-CH_2-$
D)Phenyl	4) $CH_3-CH = CH-$
	5) $CH_2 = CH - CH_2-$

1.

The correct match is

A. I

B. II

C. III

D. IV

Answer: A::C::D

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LIST - 1 (compound)	LIST - 2 (common name)
A) Propenol	1) Allyl alcohol
B) 1,4-Dimethylbenzene	2) p–Xylene
C) Propanone	3) Phenol
D) Hydroxybenzene	4) Acetone
	5) m–Xylene

2.

The correct match is

A. II

B. III

C. IV

D. V

Answer: A::B

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3. Which of the following statement is right

A. All molecules containing two or more chiral C-atoms must be optically active

B. All molecules having one chiral C-atom is optically active

C. Molecules without chiral carbon atoms can be optically active

D. All molecules having two equal chiral C-atoms have three stereoisomers

Answer: B::C::D

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LECTURE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-II (ADVANCED) Linked Comprehension Type Questions

1. Compounds having the same molecular formula, same structure with different configuration are called stereoisomers and the phenomenon is called stereoisomerism. The phenomenon is broadly classified with three types called (a) geometrical isomerism (b) optical isomerism and (c)

conformational isomerism.

Which of the following compounds exhibit both geometrical as well as optical isomerism

A. $CH_2 = CH - CH - \underset{\underset{OH}{|}}{C}H - CH_3$

B. $CH_3 - CH = CH - \underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}} - CH_3$

C. $CH_3 - CH = CH - \underset{\underset{CH_3}{|}}{C}H - CH_2CH_3$

D. $(CH_3)_2C = CH - \underset{\underset{CH_3}{|}}{C}H - CH_2CH_3$

Answer: C

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2. Compounds having the same molecular formula, same structure with different configuration are called stereoisomers and the phenomenon is called stereoisomerism. The phenomenon is broadly classified with three types called (a) geometrical isomerism (b) optical isomerism and (c)

conformational isomerism.

Which of the following compounds possess diastereisomerism

$$\underset{I}{CH_3CH} = CHCH_3 \qquad \underset{II}{CH_3 - CH_2} - CH = CH_2 \qquad CH_3 - \underset{\underset{III}{CH_3}}{\overset{|}{C}} = C$$

A. I, II

B. I, III

C. II, III

D. only

Answer: D

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3. Compounds having the same molecular formula, same structure with different configuration are called stereoisomers and the phenomenon is called stereoisomerism. The phenomenon is broadly classified with three types called (a) geometrical isomerism (b) optical isomerism and (c) conformational isomerism.

Which of the following compounds possess diastereisomerism

$$\underset{I}{CH_3CH} = CHCH_3 \qquad CH_3 - \underset{II}{CH_2} - CH = CH_2 \qquad CH_3 - \underset{\underset{III}{CH_3}}{\overset{|}{C}} = C$$

A. 2, 3-dichloropentane

B. 2, 3-dichlorobutane

C. 2, 3, 4-trichloropentane

D. All the above

Answer: B

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LECTURE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-II (ADVANCED) Integer Type Questions

1. $CH_3 - \underset{OH}{\overset{|}{C}}H - \underset{OH}{\overset{|}{C}}H - CH_2 - CH_3$ number of optical isomers possible for this compound is

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2. Number of chiral C-atoms present in 1,3-dimethyl cyclobutane

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3. Write the structural formula of the following:

(a) 2, 3-dimethyl hexanal

(b) 2-methyl-1-butene

(c) 2-aminopropanoic acid

(d) 3-bromo-4-methyl heptane

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PRACTICE SHEET EXERCISE-I (Structural Isomerism) LEVEL-I (MAIN) Straight Objective Type Questions

1. In a mutational event, when adenine is replaced by guanine, it is a case of

A. 3

B. 7

C. 4

D. 6

Answer: A

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2. Which of the following pairs represents isomers of each other

A. 

B. CH_3OCH_3 & CH_3COCH_3

C. 

D. CH_3CH_2OH & $C_2H_5OC_2H_5$

Answer: A

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3. The total no. of possible dichloro derivatives of isobutene are :

A. 2

B. 4

C. 5

D. 6

Answer: C

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4. I) $CH_3 - CH_2 - CH_2CH_2 - OH$ II) $CH_3 - CH_2 - \underset{\underset{OH}{|}}{C}H - CH_3$ III)

$$CH_3 - \overset{\overset{OH}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_3$$

Among these , III is the chain isomer of

A. I only

B. II only

C. both I and II

D. none of these

Answer: C

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5. How many primary amine structural isomers are possible with the molecular formula $C_4H_{11}N$.

A. 6-Aldehyde, 4-Ketone

B. 5-Aldehyde, 3-Ketone

C. 4-Aldehyde, 3-Ketone

D. 5-Aldehyde, 2-Ketone

Answer: B

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6. The number of primary, secondary and tertiary amines possible with the molecular formula C_3H_9N respectively.

A. 1, 2, 2

B. 1, 2, 1

C. 2, 1, 1

D. 3, 0, 1

Answer: C

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7. How many structural isomers are possible in structure c_7H_9N Containing benzene ring:

A. 5

B. 4

C. 6

D. 20

Answer: A

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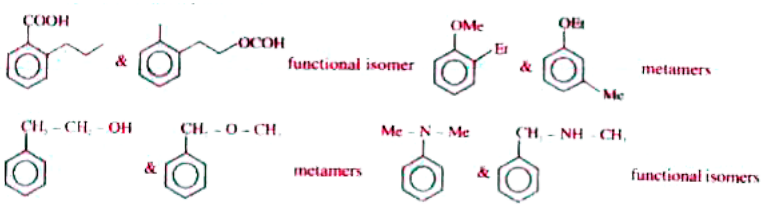
8. Which of the following optoins are correctly matched?



A. TFTF

B. FTTF

C. TTFT

D. TFFT

Answer: C

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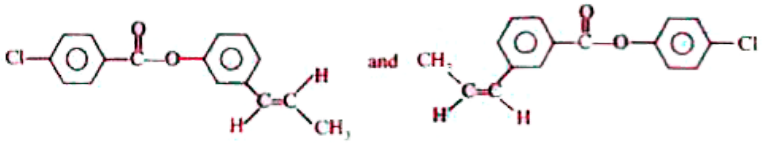
9.



Shows which type of isomerism

A. Functional group isomerism

B. Geometrical isomerism

C. Metamerism

D. Position isomerism

Answer: C

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10. Write the structural formulas and IUPAC names for all possible isomers having the number of double or triple bond as indicated:

C_4H_8 (one double bond)

A. 3

B. 4

C. 5

D. 6

Answer: C

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11. $C_{40}H_{56}$ is the empirical formula of

A. 1

B. 2

C. 3

D. 4

Answer: C

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12. How many carboxylic acid structures (structural isomers) can be written from the molecular formula $C_6H_{12}O_2$.

A. 4

B. 6

C. 8

D. 10

Answer: C

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13. $C_4H_4O_4$ can be

A. A cyclic ester of dibasic acid

B. A cis-dibasic acid

C. A trans-dibasic acid

D. All true

Answer: D

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14. In which of the following pairs of compounds are the two members of the pair constitutional isomers?

A. methoxymethane and ethoxyethane

B. pentanol and pentanediol

C. propyl alcohol and di-n-propyl ether

D. isobuty alcohol and diethyl ether

Answer: D

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15. Number of structural isomers with the formula $C_4H_{11}N$

A. 2

B. 8

C. 6

D. 5

Answer: B

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16. Which of the following is a pair of functional isomers?

A. $CH_3COCH_3.\ CH_3CHO$

B. $C_2H_5CO_2H, CH_3CO_2CH_3$

C. $C_2H_5CO_2H, CH_3CO_2C_2H_5$

D. CH_3CO_2H, CH_3CHO

Answer: B

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17. Constitutional isomers is possible between memebers of which of the following types of compounds?

A. amines and amides

B. amides and carboxylic acids

C. primary amines and secondary amines

D. amines and aldehydes

Answer: C

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PRACTICE SHEET EXERCISE-I (Structural Isomerism) LEVEL-II (ADVANCED) Straight Objective Type Questions

1. Which of the following molecules is likely to possess functional isomerism

A. CH_3OH

B. CH_3COCH_3

C. CH_3NH_2

D. HCOOH

Answer: B

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2. RCN and RNC are..... isomers :

A. functional

B. tautomers

C. chain

D. position

Answer: A

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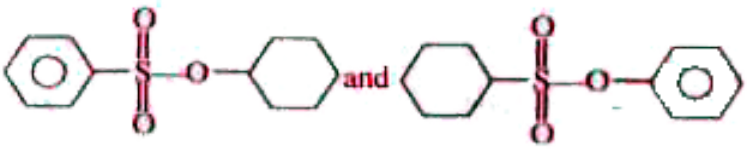
3. Given compound shows which type of isomerism



A. Chain isomerism

B. Positional isomerism

C. Metamerism

D. Functional group isomerism

Answer: C

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4. Ortho, meta and para dichlorobenzenes are

A. Chain isomers

B. Positional isomers

C. Functional isomers

D. Stereoisomers

Answer: B

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5. Number of isomers for the compound dihydroxy benzene

A. 1

B. 2

C. 3

D. 4

Answer: C

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6. An organic compound of structure $CH_3 - CH_2 - CH_2 - CO - CH_3$ shows functional isomerism with another organic compound of structural formula_____

A. $CH_3 - CH_2 - CO - CH_2 - CH_3$

B. $CH_3 - CH_2 - CH_2 - CH_2CHO$

C. $CH_3 - CH = CH - CH_2 - CH_2OH$

D. (b) and (c)

Answer: D

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7. The number of benzene isomers for C_8H_{10} ?

A. 1

B. 2

C. 3

D. 4

Answer: D

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8. Compounds with $C_4H_{11}N$ as molecular formula can exhibit

A. Position isomerism

B. Metamerism

C. Functional isomerism

D. All the three

Answer: D

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9. The no. of amides having formula C_4H_9NO are :

A. 5

B. 6

C. 7

D. 8

Answer: D

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10. Which of the following statements is right

A. All caboxylic acids exhibits functional isomers as esters

B. All alkynes exhibit chain isomerism

C. All ketones exhibit functional isomers as aldehydes

D. All ketones exhibit chain isomerism

Answer: C

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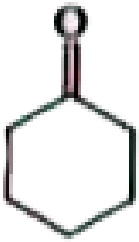
11. Tautomer in following is Diad system :

A. CH_3COCH_3

B. $CH_3CH_2NO_2$

C. 

D. HCN

Answer: D

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12. What statement is correct for Keto-enol tautomerism ?

A. Tautomersim is catalysed by acid and base.

B. Tautomers are present in dynamic equilibrium state.

C. Generally keto form is more stable than enol form.

D. All

Answer: D

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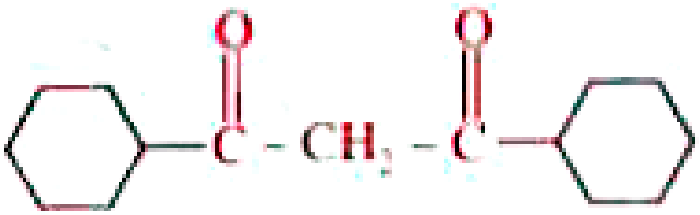
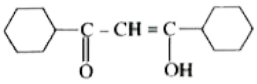
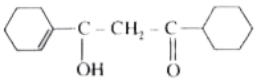
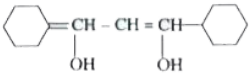
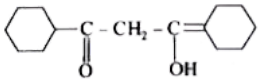
13. Tautomer of following compound is :



A. 

B. 

C. 

D. 

Answer: A

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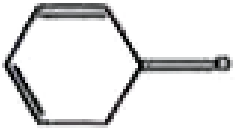
14. Maximum enolisation takes place in :

A. CH_3COCH_3

B. CH_3COCH_2CHO

C. $CH_3COCH_2COCH_3$

D. 

Answer: D

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15. Tautomerism exhibited by

A. $(CH_3)_3CNO$

B. $(CH_3)_2NH$

C. R_3CNO_2

D. $R - CH_2 - NO_2$

Answer: D

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16. Tautomers possess

A. same physical properties but different chemical properties

B. same chemical properties but different physical properties

C. different physical and chemical properties

D. same physical and chemical properties

Answer: C

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17. Which of the following statement is incorrect?

A. Acid catalysed enolisation involve the intermediate carbanion

B. Racemisation occurs on keeping aqueous solution of carbonyl compounds in which a-carbon is asym metric containing one

enolisable proton

C. Enol form is less stable than keto form in cyclopent-1,2-dione

D. Keto form is more stable than enol in butan-1,2-dione

Answer: C

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18. Which of the fillowing pairs cannot exist in between two structural isomers

A. Functional and position

B. Ring-chain and functional

C. Metamerism and functional

D. Chain and functional

Answer: A

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19. Choose the correct enol content order of the following compounds in their pure liquid state

I) CH_3COCH_3 II) $CH_3COCH_2COOC_2H_5$ III) $C_6H_5COCH_2COOC_2H_5$

IV) $CH_3COCH_2COCH_3$ V) $C_6H_5COCH_2COCH_3$

A. I $>$ II $>$ III

B. I $>$ III $>$ II

C. III $>$ II $>$ I

D. II $>$ III $>$ I

Answer: A

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20. Write the IUPAC name of the $CH_3-\underset{CH_3}{\underset{|}{C}}H-\underset{OH}{\underset{|}{C}}H-\overset{CH_3}{\overset{|}{\underset{CH_3}{\underset{|}{C}}}}-CH_3$ compound.

A. $CH_3 - \overset{OH}{\overset{|}{C}}H - \overset{OH}{\overset{|}{C}}H - Ph$

B. $H - \overset{O}{\overset{||}{C}} - CH_2 - \overset{OH}{\overset{|}{C}}H - Ph$

C. $CH_3 - \underset{OH}{\overset{|}{C}}H - \underset{O}{\overset{||}{C}} - Ph$

D. $CH_3 - \underset{O}{\overset{||}{C}} - \underset{O}{\overset{||}{C}} - Ph$

Answer: C

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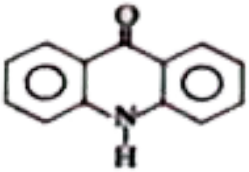
21. Which of the following can be used for nitration of aromatic compound ?

A. $CD_3 - \underset{O}{\overset{||}{C}} - Ph$

B.



C.

D. All

Answer: D

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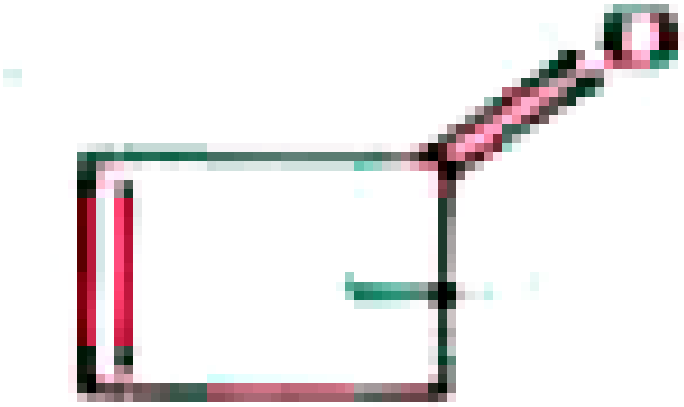
22. Decreasing order of enol content of the following compound in liquid phase

I) $CH_3 - \overset{O}{\overset{||}{C}} - CH_2 - \overset{O}{\overset{||}{C}} - O - Et$ II) $CH_3 - \overset{O}{\overset{||}{C}} - CH_2 - \overset{O}{\overset{||}{C}} - CH_3$

III) $Ph - \overset{O}{\overset{||}{C}} - CH_2 - \overset{O}{\overset{||}{C}} - Ph$



A. I $>$ II $>$ III $>$ IV

B. III $>$ II $>$ I $>$ IV

C. III $>$ II $>$ IV $>$ I

D. II $>$ III $>$ I $>$ IV

Answer: B

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PRACTICE SHEET EXERCISE-I (Structural Isomerism) LEVEL-II (ADVANCED)

More than one correct answer Type Questions

1.

LIST - I

A) Very dilute H_2SO_4 by inert electrodes

B) Potential is zero Volts

C) 50% H_2SO_4 by inert electrodes

D) $Zn/Zn^{+2}(aq)//Cu^{+2}(aq)/Cu$

LIST - II

1) $Hg/Hg_2Cl_{2(s)}$, KCl(salt)

2) $H_2S_2O_8$ at anode

3) Daniel cell

4) O_2 at anode

5) Pt, H_2(1atm)/H^+(1M)

The correct match is

	A	B	C	D
1)	4	5	2	3
2)	2	1	4	3
3)	2	5	4	3
4)	5	3	1	2

The correct match is

A. % of form I increases in H_2O

B. % of form II decreases in H_2O

C. % of form I increases with temperature

D.

Answer: A::B::C::D

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2. Chain isomer of cyclobutene is

A. $CH_3CH_2CH = CH_2$

B. $CH_3CH_2CH = CH - CH_3$

C. 

D. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH_2$

Answer: C

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3. The minimum number of carbon atoms to be present in an alkyne to exhibit chain isomerism is

A. 3

B. 4

C. 5

D. 6

Answer: B

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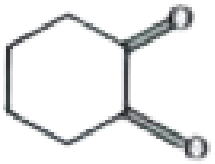
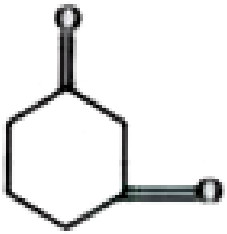
4. In which of the following cases enol content will be higher than the keto content in n-hexane?

A. $CH_3 - \overset{O}{\overset{||}{C}} - \overset{O}{\overset{||}{C}} - CH_3$

B. 

C. 

D. $H_5C_2O - \overset{O}{\overset{||}{C}} - CH_2 = \overset{O}{\overset{||}{C}} - OC_2H_5$

Answer: B::C

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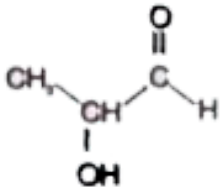
5. Which of the following are functional isomers of methyl ethanoate ?

A. $CH_3 - CH_2 - COOH$

B. 

C. $CH_3 - O - CH_2 - \overset{\overset{O}{||}}{C} - H$

D. $\underset{\underset{OH}{|}}{C}H_2 - \overset{\overset{O}{||}}{C} - CH_3$

Answer: A::B::C::D

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PRACTICE SHEET EXERCISE-I (Structural Isomerism) LEVEL-II (ADVANCED)

Linked Comprehension Type Questions (Passage -I)

1. Molecules having same molecular formula. But differing in structure (or) spatial orientation of atom is known isomers and phenomenon known as isomerism. Molecules which differ in structural formula are known as structural isomers and phenomenon is known as structural isomerism structural isomerism can be broadly classified as

(i) Chain isomerism (ii) Positional isomerism (iii) Functional isomerism

(iv) Metamerism (v) Tautomerism

Molecules having same molecular formula but differing in spatial orientation are known as stereo isomers and the phenomenon known as stereo isomerism. Stero isomerism can be classified as

(i) Geometrical isomerism (ii) Optical isomerism

Which of the following pair exhibit functional isomerism

A. ether and alcohol

B. ether and ketone

C. ketone and carboxylic acid

D. carboxylic acid and alcohol

Answer: A

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2. Molecules having same molecular formula. But differing in structure (or) spatial orientation of atom is known isomers and phenomenon known as isomerism. Molecules which differ in structural formula are known as structural isomers and phenomenon is known as structural isomerism structural isomerism can be broadly classified as

(i) Chain isomerism (ii) Positional isomerism (iii) Functional isomerism

(iv) Metamerism (v) Tautomerism

Molecules having same molecular formula but differing in spatial orientation are known as stereo isomers and the phenomenon known as stereo isomerism. Stero isomerism can be classified as

(i) Geometrical isomerism (ii) Optical isomerism

How many structural isomers possible for the given compound $C_4H_{10}O$

A. 5

B. 6

C. 7

D. 10

Answer: C

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3. Molecules having same molecular formula. But differing in structure (or) spatial orientation of atom is known isomers and phenomenon known as isomerism. Molecules which differ in structural formula are known as structural isomers and phenomenon is known as structural isomerism structural isomerism can be broadly classified as

(i) Chain isomerism (ii) Positional isomerism (iii) Functional isomerism

(iv) Metamerism (v) Tautomerism

Molecules having same molecular formula but differing in spatial orientation are known as stereo isomers and the phenomenon known as stereo isomerism. Stero isomerism can be classified as

(i) Geometrical isomerism (ii) Optical isomerism

The phenomenon in which molecules having same molecular formula and

same functional group but differing in the nature of alkyl group attached to functional group known as

A. Functional isomerism

B. Metamerism

C. Structural isomerism

D. Positional isomerism

Answer: B

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4. Tautomerism is due to spontaneous interconversion of two isomeric forms with differentfunctional groups into each other. The term tautomer means constitutional isomers thatundergo such rapid inter conversion that they cannot be independently isolated. In keto-enol tautomerism although Keto form in general is more stable, but some factors like H-bonding and extended double bonds conjugation may increase the stability of enol form

Enolic form of acetyl acelone is stabilized due to

(I) resonance as a result of conjugation

(II) intra molecular H-bonding (III) dipole- dipole repulsion

A. I and III

B. II and III

C. I and II

D. I only

Answer: C

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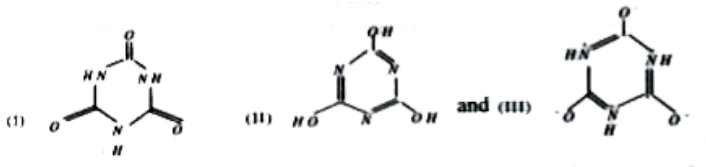
5. Tautomerism is due to spontaneous interconversion of two isomeric forms with differentfunctional groups into each other. The term tautomer means constitutional isomers thatundergo such rapid inter conversion that they cannot be independently isolated. In keto-enol tautomerism although Keto form in general is more stable, but some factors like H-bonding and extended double bonds conjugation may increase the

stability of enol form

Which of the following statements are correct of the following



A. I and II are tautomers

B. III is conjugate base of II

C. I and Ill are tautomers

D. III is resonance structure of I

Answer: A::D

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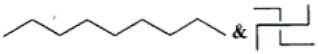
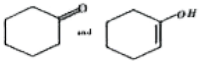
PRACTICE SHEET EXERCISE-I (Structural Isomerism) LEVEL-II (ADVANCED) Matrix Matching Type Questions

1. Match the following columns

Column-I	Column-II
A) $CH_3CH_2COOCH_2CH_3$ and $CH_3COOCH_2CH_2CH_3$	P) functional group isomer
B) CH_3COOH and $HCOOCH_3$	Q) Metamer
C) 	R) Chain isomers
D) 	S) Tautomer

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2.

Column-I	Column-II
A) Esters and Carboxylic acid	P) Chain isomerism
B) n-Butanol and Iso butanol	Q) Tautomerism
C) Acetone and 2-propenol	R) Functional Isomerism
D) Maleic acid and fumeric acid	S) Geometrical Isomerism

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PRACTICE SHEET EXERCISE-I (Structural Isomerism) LEVEL-II (ADVANCED)

Integer Type Questions

1. The number of structural isomers possible for C_7H_{16} is _____

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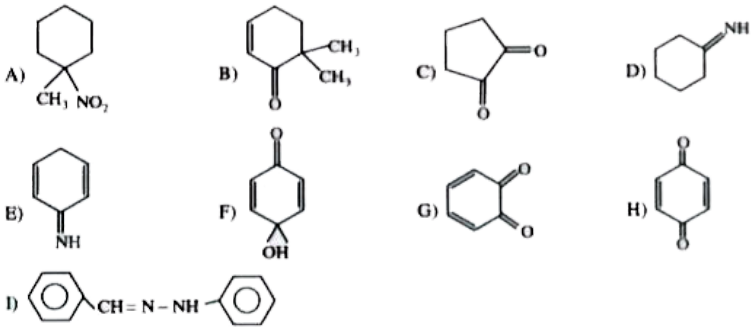
2. Among the following compounds how many can exhibit tautomerism?



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3. Total no. of isomeric alkadienes with the molecular formula C_5H_8

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PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-I (MAIN) Straight Objective Type Questions

1. The dihedral angle between the two methyl groups in gauche conformation of n-butane is

A. 120°)

B. 60°

C. 180°

D. 0°

Answer: B

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2. The dihedral angle between the two methyl groups in anti conformation of n-butane is

A. 120°

B. 180°

C. 45°

D. 60°

Answer: B

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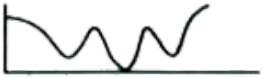
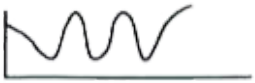
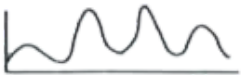
3. The number of conformational isomers possible of n-butane about $C_2 - C_3$ bond

A. 

B. 

C. 

D. 

Answer: B

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4. Match List-I with List-II and select the correct option.

List - I	List - II
I) Friedrich Meischer	A) Double helical model of DNA
II) Wilkins & Franklin	B) X-ray difraction data of DNA
III) Watson & Crick	C) $A + T \neq C + G$
IV) Meselson & Stahl	D) Nuclein
V) Chargaff	E) Proved semi-conservative replication of DNA

	I	II	III	IV	V
1)	D	A	B	E	C
2)	D	B	A	C	E
3)	C	B	A	E	D
4)	D	B	A	E	C

A. P, R

B. Q, R

C. S, P

D. R, Q

Answer: C

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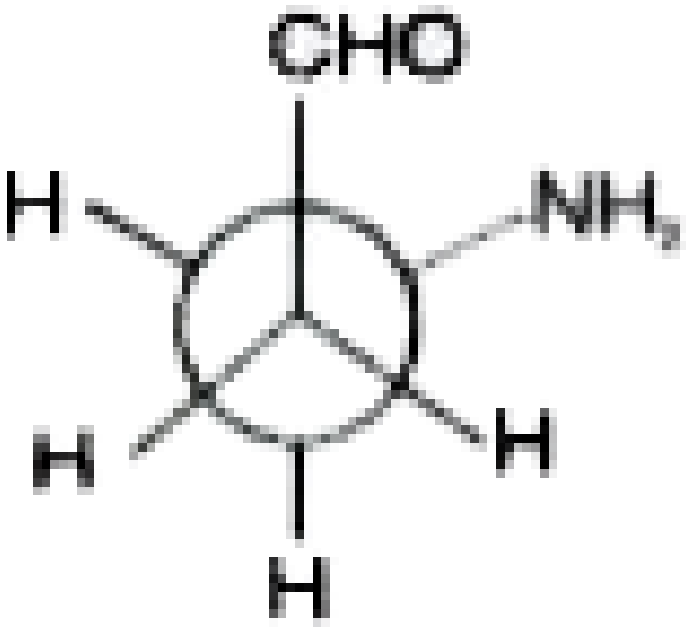
5. Consider the following conformations of 3-Aminopropanal, amongst the given conformations (P, Q, R, S) one of them is most stable.



The correct statements for the above is/are

(I) H-bonding is present in the most stable conformer

(II) Gauche conformation is the most stable conformer

(III) Anti conformation is the most stable conformer

(IV) larger groups being separated by maximum distance in the conformer

A. II & IV

B. I & II

C. III & IV

D. I & IV

Answer: B

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6. Most stable carbocation among the following is

A. Anti

B. Gauche

C. Partially eclipsed

D. Fully eclipsed

Answer: B

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7. Sino-atrial node is present in

A. Chair form of cyclohexane

B. Antiform of n-butane

C. Boat form of cyclohexaned

D. Fully eclipsed form of nbutane

Answer: C

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8. Which of the following is associated with Torsional strain ?

A. Repulsion between bond pair of electrons

B. Inductive effect

C. Bond angle strain

D. Attraction of opposite charges

Answer: A

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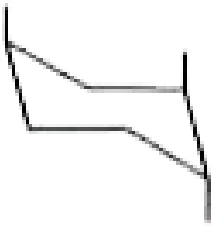
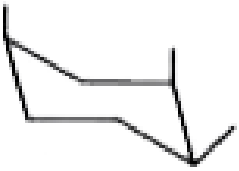
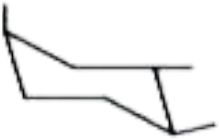
9. Among the structure shown below, which has lowest potential energy?

A. 

B. 

C. 

D. 

Answer: D

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10. Increasing order of stability among the three main conformation (i.e. eclipse, anti, gauche) of ethylene glycol is :

A. Eclipse, gauche, anti

B. Gauche, eclipse, anti

C. Eclipse, anti, gauche

D. Anti, gauche, eclipse

Answer: C

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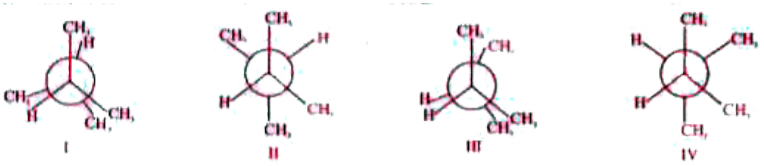
11. In which of the following has minimum torsional strain and minimum Vander waal strain.



A. I

B. II

C. III

D. IV

Answer: B

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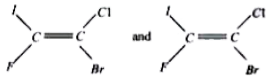
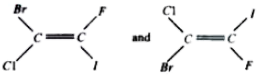
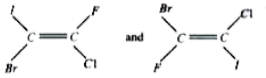
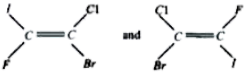
12. Which of the following pairs of compounds are geometrical isomers

A. 

B. 

C. 

D. 

Answer: D

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13. The cause of cis-trans isomerism is

A. strength of the double bond

B. stability of the double bond

C. vibration of the double bond

D. lack of rotation about the double bond

Answer: A

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14. Which of the following compounds exhibits geometrical isomerism?

$\underset{(i)}{CH_2 = CHCH_3}$ $\underset{(ii)}{CH_3CH = CHCH_3}$

$\underset{(iii)}{CH_3CH = C = CHCH_3}$ $\underset{(iv)}{CH_3CH = C = C = CHCH_3}$

A. (ii), (iv)

B. (ii), (iii) and (iv)

C. (ii), (iii)

D. (i), (iii)

Answer: A

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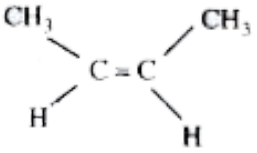
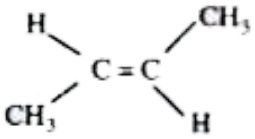
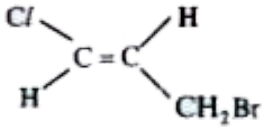
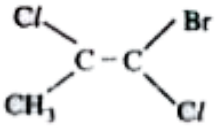
15. Which of the following is classified as Z and trans-isomer?

A. 

B. 

C. 

D. 

Answer: D

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16. Geometrical isomerism results because molecules has :

A. a centre of symmetry

B. a plane of symmetry

C. the capacity to rotate the plane of polarized light

D. two dissimilar groups attached to a double bonded carbon atom

Answer: D

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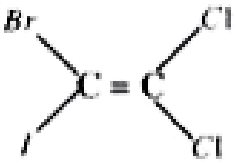
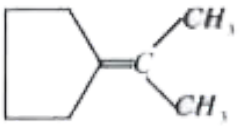
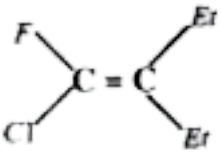
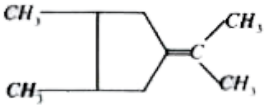
17. Which of the following can show geometrical isomerism

A. 

B. 

C. 

D. 

Answer: D

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18. 

Which of the following orders of stability is correct among these two isomers?

A. I = II

B. I > II

C. II > I

D. Cannot be predicted

Answer: C

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PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Straight Objective Type Questions

1. Which of the following statements regarding

(I) cis-2-pentene & (II) trans-2-pentene is correct

A. I & II are a pair of diastereoisomers

B. I & II are a pair of geometrical isomers

C. I & II on hydrogenation give same product

D. all the above

Answer: D

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2. The common characteristic of cis 2-butene and trans-2-butene is

A. Boiling point

B. Dipole moment

C. Heat of hydrogenation

D. Product of hydrogenation

Answer: D

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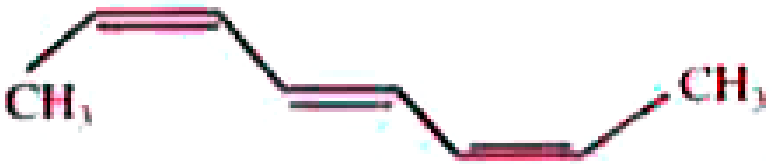
3. The IUPAC name of the compound



A. (2E, 4E, 6Z) -octa - 2,4,6-triene

B. (2E,4E,6E)-octa-2,4,6-triene

C. (2Z, 4E, 6Z) -octa -2,4,6-triene

D. (2Z, 42, 6Z) -octa -2,4,6-triene

Answer: C

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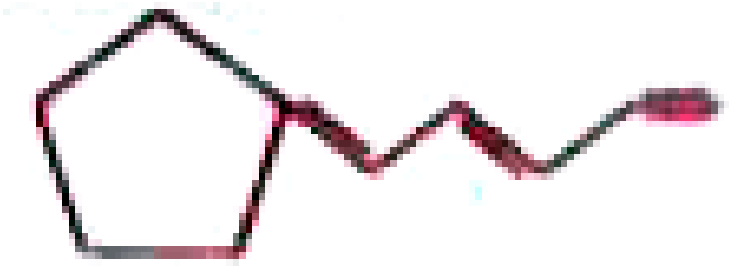
4. The number of cis-trans isomer possible for the following compound



A. 2

B. 4

C. 6

D. 8

Answer: A

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5. Which of the following have zero dipole moment?

A. henzene 1,4- dinl

B. trans-1,2-dichloro ethene

C. cis-1,2-dichloro ethene

D. 1,1-dichloro ethene

Answer: B

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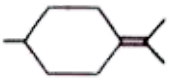
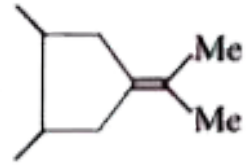
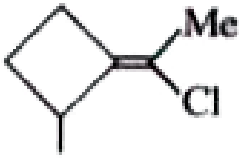
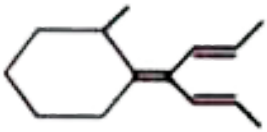
6. Which one of the following will not show geometrical isomerism ?

A. 

B. 

C. 

D. 

Answer: A

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7. Geometrical isomerism is possible in:

A. isobutene

B. acetone oxime

C. acetophenone oxime

D. benzophenone oxime

Answer: C

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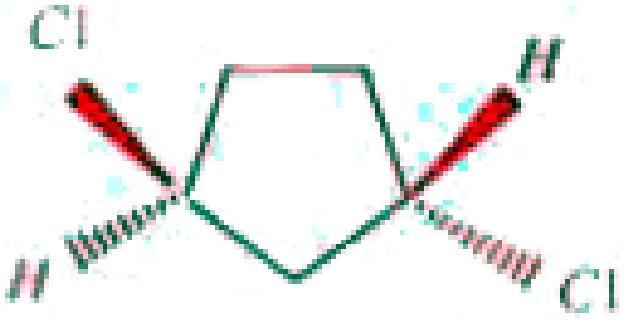
8. Select the systematic name for



A. cis-1,3-Dichlorocyclopentane

B. trans-1,4-Dichlorocyclopentane

C. cis-1,2-Dichlorocyclopentane

D. trans - 1,3-Dichlorocyclopentane

Answer: D

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9. Tautomer of which of the following can show geometrical isomerism

A. $CH_3 - CHO$

B. $CH_3CH_2 - CHO$

C. $(CH_3)_2CH - CH = O$

D. 

Answer: B

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10. Which of the following statements is not true regarding the cis and trans isomers of an alkene

A. They are configurational isomers

B. They are diastereomers

C. The cis-isomer has higher dipole moment than the trans-isomer

D. The cis isomer usually has a lower boiling point than the trans-isomer

Answer: D

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11. Which of the following pairs of compounds are geometrical isomers

A. Crotonic acid and cinnamic acid

B. Maleic acid and malonic acid

C. Ethylene dichloride and ethylidene dichloride

D. Maleic acid and fumaric acid

Answer: D

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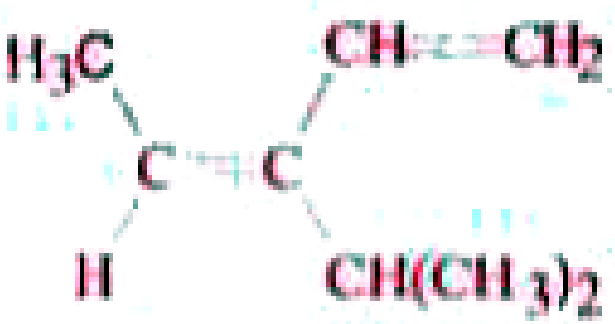
12.  is

A. E-isomer

B. Z-isomer

C. Cis-isomer

D. Trans-isomer

Answer: B

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13. Regarding geometrical isomers which is not correct

A. both cis and trans isomer posses same m.p

B. cis and trans isomers differ in solubilities

C. cis and trans isomers differ in dipole moment

D. cis and trans isomers exhibit similar but not identical chemical properties

Answer: A

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14. No.of geometrical isomers possible for the compound $CH_3 - CH = CH - CH = CH - C_2H_4$

A. 2

B. 3

C. 4

D. 5

Answer: C

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15. Geometrical isomerism is not shown by

A. $(CH_3CH_2)_2C = C - \underset{CH_3}{\underset{|}{C}}\ H_2CH_3$

B. $C_2H_5 - \underset{H}{\underset{|}{C}} = \underset{H}{\underset{|}{C}} - CH_2I$

C. $CH_3CH = C(Cl)CH_3$

D. $CH_3 - CH = CH - CH = CH_2$

Answer: A

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16. Find out the total number of isomers of possible for $C_2H_2F_2$

A. 2

B. 3

C. 4

D. 5

Answer: B

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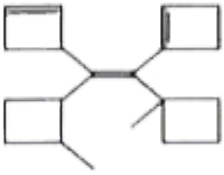
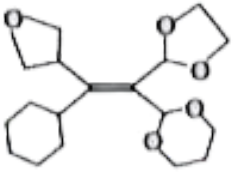
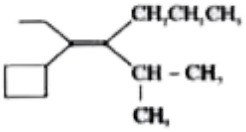
17. Which among the following is E-Isomer ?

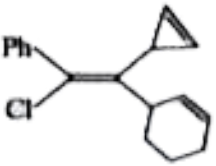
A. 

B. 

C.



D.



Answer: D

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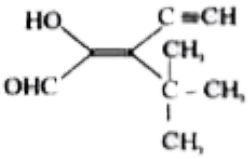
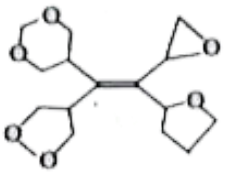
18. Which among the following is Z-Isomer ?

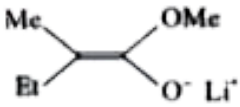
A.



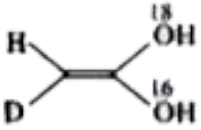
B.



C.



D.



Answer: A

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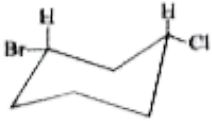
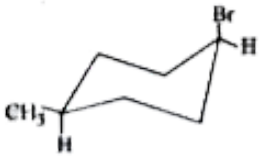
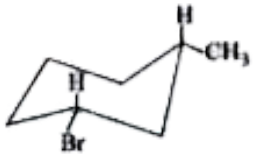
19. Determine which of the following compounds is a trans isomer ?

A.

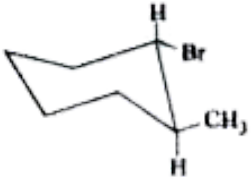


B.





C.



D.

Answer: D

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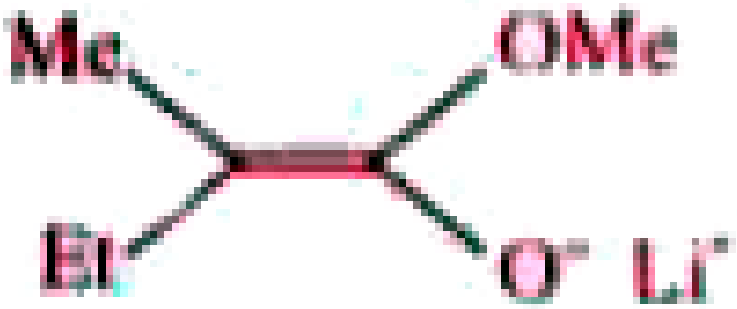

20.

Which of the following statement is correct regarding this structure ?

A. It is Cis

B. It is Trans

C. It is E

D. It is Z

Answer: C

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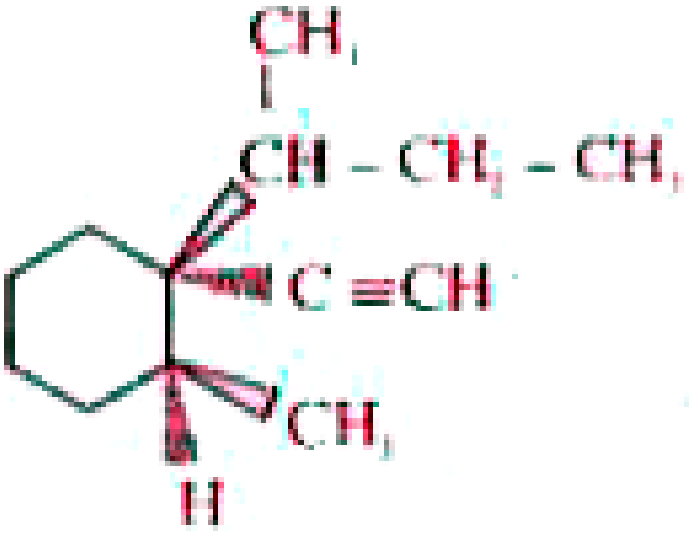

21.

Which of the following statement is correct regarding this structure ?

A. It is Cis

B. It is Trans

C. It is E

D. It is Z

Answer: C

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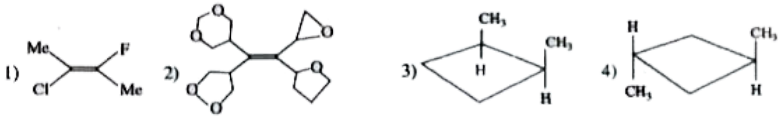
22. Which of the following molecule is E- isomer ?



A. 1 & 4

B. 2 & 4

C. 1, 2 & 4

D. Only 4

Answer: C

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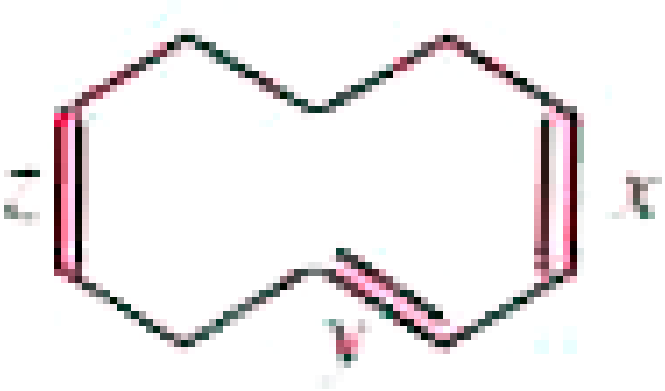
23. In the given structure



A. x, y and z represent Z-configuration

B. x, y and. z represent E-configuration

C. x and z represent E-configuration while y represents Z-configuration

D. x and z represent Z-configuration while y represents E-configurations

Answer: D

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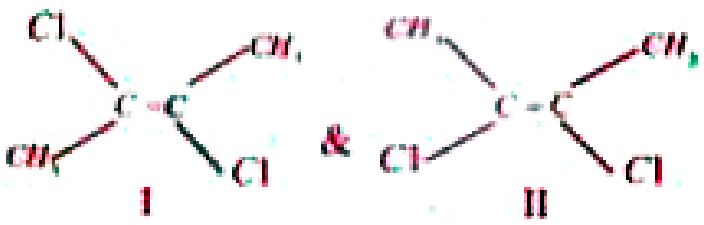
PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) More than One correct answer Type Questions

1. Which statement is/are right regarding



A. They are geometrical isomers

B. They are diastereoisomers

C. I is E-isomer and II is Z-isomer

D. They are enantiomers

Answer: A::B::C

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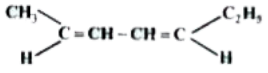
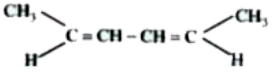
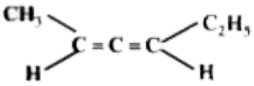
2. Which of the following can exist in three geometrical isomeric forms?

A. 

B. 

C. 

D. 

Answer: B::C

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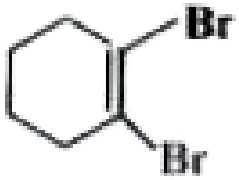
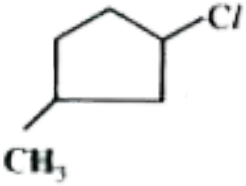
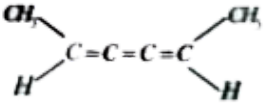
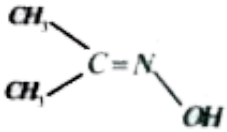
3. Which of the following can show geometrical isomerism

A. 

B. 

C. 

D. 

Answer: B::C

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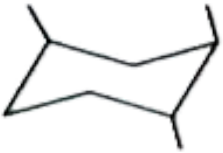
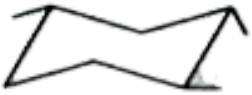
4. Which of the following trimethyl cyclohexanes is the least stable

A. 

B. 

C. 

D. 

Answer: B

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5. The molecules that will have dipole moment

A. 2,2-dimethylpropane

B. cis-2-pentene

C. 2,2,3,3-tetramethylbutane

D. trans-2-pentene

Answer: B::D

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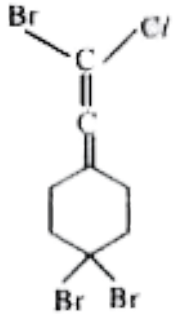
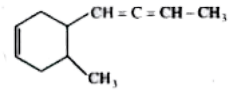
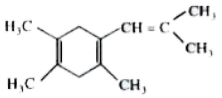
PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Linked Comprehension Type Questions (Passage - I)

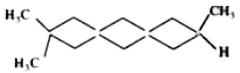
1. Those stereoisomers are called configurational isomers if they differ in spatial arrangement of atom or group and are not interconvertible without cleaving a bond. Geometrical isomer arises due to restricted rotation about a bond or centre. The number of G.I is 2^n where n= number of stereoisomers, in some cases the number of G.I is less than 2^n in case where either side nomenclature will be possible.

Which of the following compounds can show geometrical isomerism.

A. 

B. 

C. 

D. 

Answer: B

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2. Those stereoisomers are called configurational isomers if they differ in spatial arrangement of atom or group and are not interconvertible

without cleaving a bond. Geometrical isomer arises due to restricted rotation about a bond or centre. The number of G.I is 2^n where n= number of stereoisomers, in some cases the number of G.I is less than 2^n in case where either side nomenclature will be possible.

The number of G.I. of the compound $C_2H_5 - CH = CH - CH = CH - CH = CH - CH_3$ is

A. 4

B. 3

C. 8

D. 6

Answer: C

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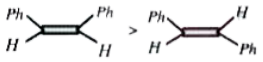
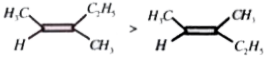
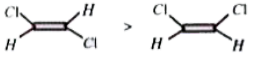
3. Those stereoisomers are called configurational isomers if they differ in spatial arrangement of atom or group and are not interconvertible without cleaving a bond. Geometrical isomer arises due to restricted

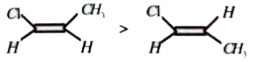
rotation about a bond or centre. The number of G.I is 2^n where n= number of stereoisomers, in some cases the number of G.I is less than 2^n in case where either side nomenclature will be possible.

Which of the following pairs has correct stability order :

A. 

B. 

C. 

D. 

Answer: C

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PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Linked Comprehension Type Questions (Passage - II)

1. Configuration isomerism is shown by the compounds in which groups or atoms are arranged with rigid part like double bonded atoms, cycle asymmetric centre etc. Geometrical isomerism is possible in case of double bonded atoms as well as in cycle. The phytical. Properties of geometrical isomer differs which is observed fact.

Which of the following is true for 2 - butene ?

A. cis-form-contain more b.p than trans form

B. trans-form-contain less m.p than cis form

C. cis-form is more stable than trans form

D. refractive index of cis suriu is less than liaus funn

Answer: A

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2. Which of the following is an inner orbital complex as well as diamagnetic in nature ?

A. cis-1,4-dimethyl cyclohexane will contains dipole moment value zero

B. trans- 1,3-dimethyl cyclohexane will contain dipole moment value zero

C. trans- 1,3 - dimethyl cyclobutane will contain dipole mament values zero

D. trans - 1,2-dimethyl cyclopropane will contain dipole moment value zero

Answer: C

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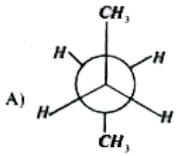
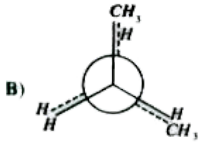
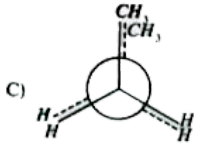
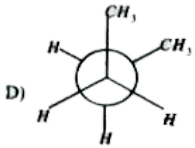
PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Matrix Matching Type Questions

1. Configuration isomerism is shown by the compounds in which groups or atoms are arranged with rigid part like double bonded atoms, cycle asymmetric centre etc. Geometrical isomerism is possible in case of

double bonded atoms as well as in cycle. The phytical. Properties of geometrical isomer differs which is observed fact.

Column-I	Column-II
A) 	P) 18.4 - 25.5 KJ/mol
B) 	Q) 14.2 KJ/mol
C) 	R) 3.3 KJ/mol
D) 	S) Zero

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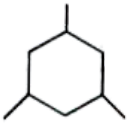
2. Match the following columns

Column-I	Column-II (Stereo Isomers)
A) $CH_3-CH=CH-CH=N-OH$	P) 2
B) 	Q) 4
C) $CH_3-CH=CH-CH=CH=CH-CH_3$	R) 6
D) $CH_3-CH=CH-CH=CH-\underset{\displaystyle CH_3}{\underset{\vert}{CH}}-Ph$	S) 8

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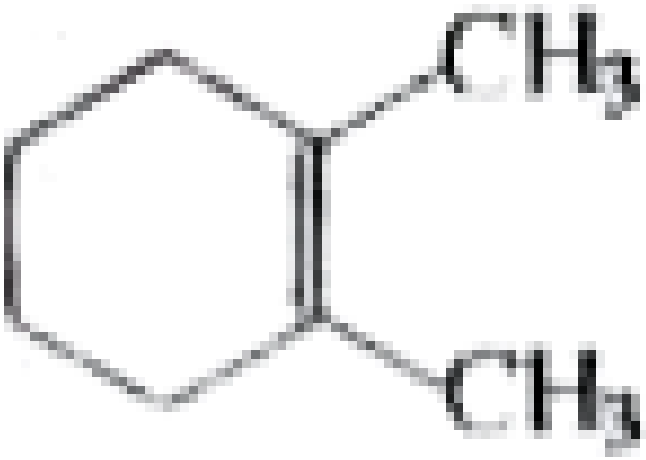

3.

The possible number of geometrical isomers for this compound which can be isolated at room temperature is

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PRACTICE SHEET EXERCISE-II (Stereo Isomerism) LEVEL-II (ADVANCED) Integer Type Questions

1. $CH_3 - CH = C = CH - CH_3$ The possible number of geometrical isomers of this diene is_____

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2. $CH_3 - CH = C = C = CH - CH_3$ How many geometrical isomers of this triene are possible _____

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PRACTICE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-I (MAIN) Straight Objective Type Questions

1. In the representation of specific rotation $\left([\alpha]_D^{250C}\right)$, .D. indicates

A. Dextro rotation

B. Configuration of -OH group

C. Configuration of -NH, group

D. Wave length of light

Answer: D

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2. A molecule as a whole is asymmetric if it does not possess

A. Plane of symmetry only

B. Centre of symmetry only

C. Axis of symmetry and alternating axis of symmetry only

D. All

Answer: D

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3. For an optically active compound specific rotation $\left([\alpha]_D^{25}\right)$ depends on

a) Length of the polarimeter tube b)Concentration of solution

c) Polarimeter instrument d) Nature of the compound

A. All

B. Only b and c

C. Only a and c

D. a,b,d

Answer: D

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4. Which of the following exists in enantiomeric pair

A. n-butyl chloride

B. ter - butyl chloride

C. sec- butyl chloride

D. iso - butyl chloride

Answer: C

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5. When two or more isotopic atoms are connected to the asymmetric chiral carbon atom of the same element, the priority sequence is :

A. Isotope of higher mass preceeds over the lower

B. Isotope of lower mass preceeds over the higher

C. All the isotopes are equivalent

D. Most stable isotope preceeds over the unstable

Answer: A

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6. (A): Meso tartaric acid is optically inactive

(R): Meso tartaric acid has no asymmetric carbon

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. (A) is false but (R) is true

Answer: C

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7. ($\pm$) Lactic acid is optically inactive due to

A. Internal compensation

B. External compensation

C. Presence of plane of symmetry

D. Absence of asymmetric carbon

Answer: B

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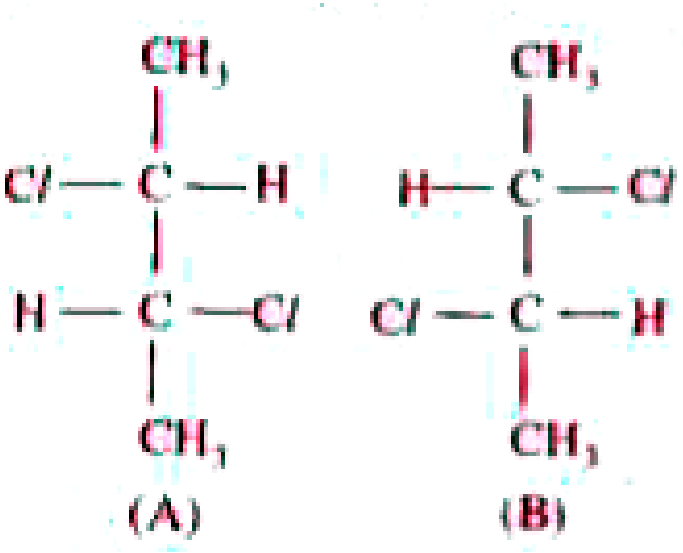
8.



If the specific rotation produced by the compound

'A'is $+52^\circ$, then the specific rotation of compound .B. is

A. -52°

B. $+52^{\circ}$

C. 0

D. Unpredictable

Answer: A

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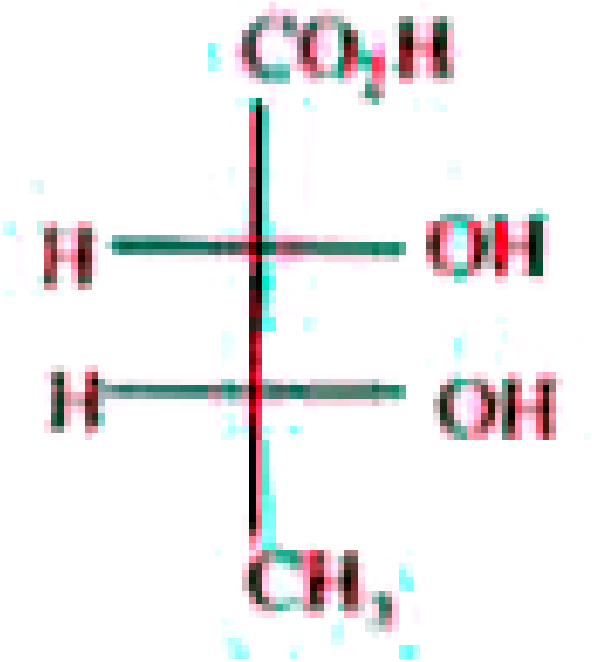
9. The incorrect statement about



A. It is erythro diastereomer

B. It has 2R, 3R configuration

C. It is meso form

D. (1) and (2)

Answer: C

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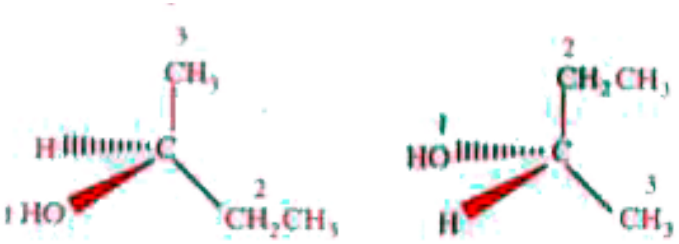
10. The pair of structures given below represent



A. Enantiomers

B. Identical

C. Achiral

D. Not stereo isomers

Answer: B

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11. Which of the following statements is not correct regarding enantiomers?

A. They have identical melting and boiling points

B. They have identical chemical properties except towards optically active reagents

C. They can be separted by fractional crystallization

D. They rotate the plane polarized light in opposite directions but to the same extent

Answer: C

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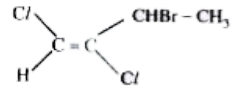
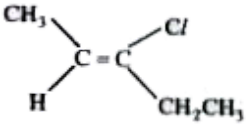
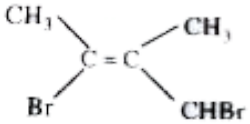
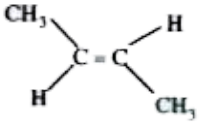
12. Which of the following will show optical isomerism?

A. 

B. 

C. 

D. 

Answer: A

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13. 2, 3-pentadiene is optically active since it

A. contains one chiral carbon atom

B. contains two chiral atoms but the molecule as a whole is achiral

C. does not contain any chiral carbon atom but the molecule as a whole is chiral

D. none of the above

Answer: C

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14. How many chiral carbon atoms are present in 2, 3, 4 -trichoropentane?

A. 3

B. 2

C. 1

D. 4

Answer: A

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15. How many isomers could be obtained by replacing one hydrogen of propene with chlorine?

A. 2

B. 4

C. 6

D. 8

Answer: B

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16. For an optically active compound α_{obs} depends on

A. Concentration of the solution

B. Length of polarimeter tube

C. Nature of the compound

D. All the above

Answer: D

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17. Which statement is incorrect about diastereomers

A. They are non-mirror images

B. Physical properties are different

C. Both may or may not be optically acitve

D. Both possess identical optical rotation

Answer: D

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18. If a compound has 'n' different types of asymmetric carbon atoms then the maximum number of possible stereoisomers are

A. 2^{n-1}

B. 2^n

C. 3^n

D. 2n

Answer: B

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19. For tartaric acid total number of possible stereo isomers (configurations only) and total no. of possible optically active isomers are.

A. 4, 4

B. 3, 3

C. 4, 2

D. 3, 2

Answer: D

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20. Total number of possible isomers (configuartional only) for 2,3,4-trichlorohexane are

A. 2

B. 4

C. 8

D. 16

Answer: C

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PRACTICE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-1I (ADVANCED) Straight Objective Type Questions

1. Maximum number of possible stereoisomers (configurational only) with the formula $CH_3CH = CHCH(CH_3)COOH$

A. 2

B. 3

C. 4

D. 6

Answer: C

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2. Maximum number of possible stereoisomers (configurational only) with the molecular formula $C_4H_{10}O$ are

A. 1

B. 2

C. 4

D. 7

Answer: B

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3. Number of stereoisomers possible for

are

A. 8

B. 16

C. 32

D. 64

Answer: A

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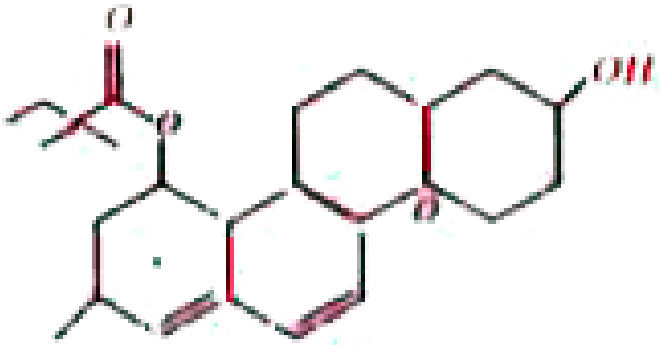
4. Number of stereogenic centers in the following compound are



A. 4

B. 7

C. 6

D. 9

Answer: B

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5. Pairs of enantiomers are :

A. I, II and III, IV

B. I, II

C. III, IV

D. IV, V

Answer: C

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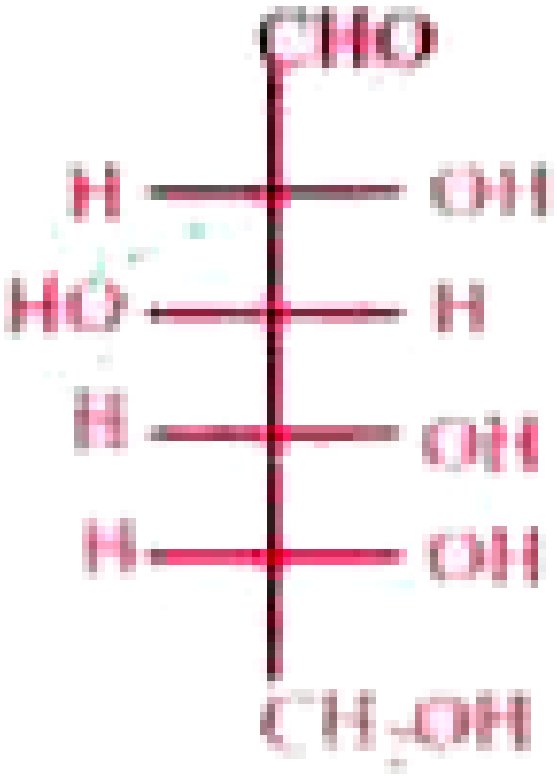
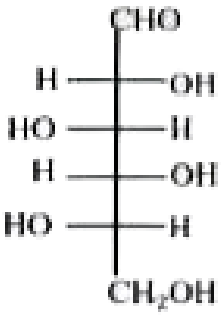
6. The structure of D-glucose was given heren

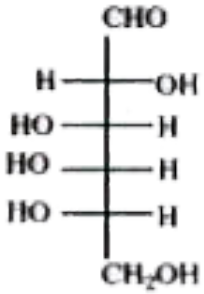


Which of the following structures repesenst glucose

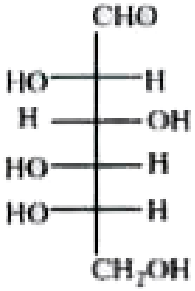
A.



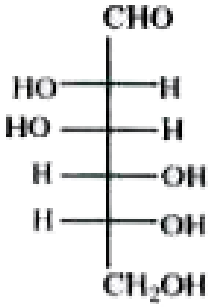
B.



C.



D.



Answer: C

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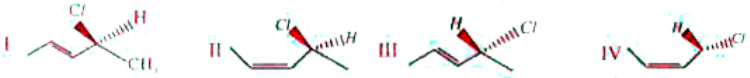
7. 

Consider the above structures.

Which of the following statements is correct

A. I and II are enantiomers

B. II and III are enantiomers

C. II and IV are diastereomers

D. I and III are enantiomers

Answer: D

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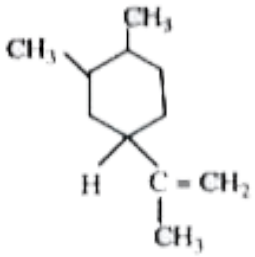
8. Which one of the following has no stereogenic center?

A.



(1-imonene)

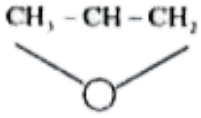
B.

(2-cyclopenten-1-ol)

C.

(3-cyclopenten-1-ol)

D.



(1,2-epoxypropane)

Answer: C

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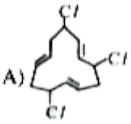
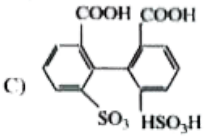
9. The chiral molecules are





A. A, B

B. B,C

C. A, C,

D. A,B,C

Answer: D

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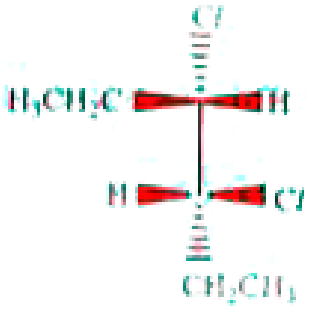
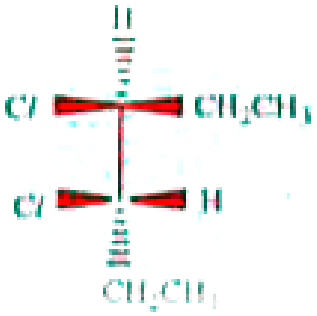
10. The molecule shown are





A. Enantiomers

B. Diastereomers

C. Constitutional isomers

D. Two conformation of the same molecule

Answer: B

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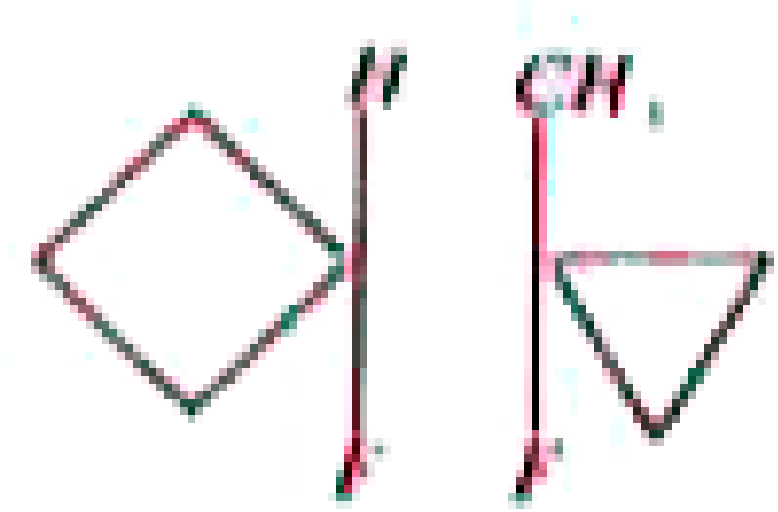
11. The molecules below are



A. Constitutional isomers

B. Enantiomers

C. Diastereomers

D. Identical

Answer: A

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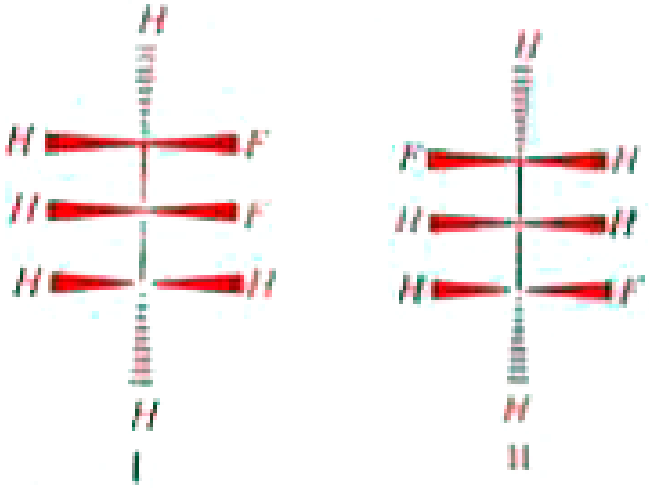
12. The molecules below are



A. Constitutional isomers

B. Enatiomers

C. Diasteromers

D. Identical

Answer: A

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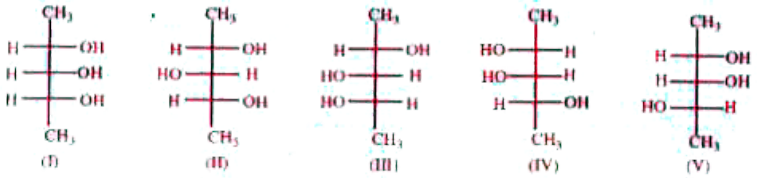
13. Which pair of structures represents the same compound?



A. I and II

B. II and III

C. III and IV

D. III and V

Answer: D

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14. In case of carbohydrates D, L indicates the

A. Configuration of - OH at last chiral carbon

B. Configuration of - OH at first chiral carbon

C. Configuration of - OH at second chiral carbon

D. Configuration of - OH at at all chiral carbon

Answer: A

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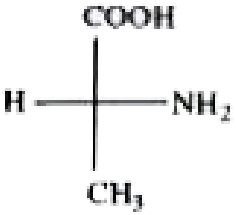
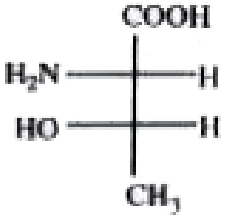
15. Among the following which has L- configuration

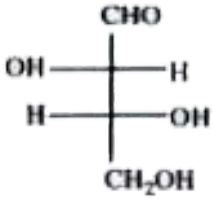
A.



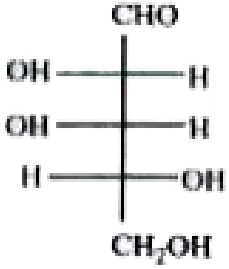
B.



C.



D.



Answer: B

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16. Which carboxylic acid(s) gives acetaldehyde on strong heating in presence of catalyst

A. $(-)Ph-\underset{\underset{CH_3}{|}}{C}H-NH_2$

B. $(\pm)Ph-\underset{\underset{CH_3}{|}}{C}H_3-NH_2$

C. $Me-NH_2$

D. $Me_2CHNHMe$

Answer: A

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17. An organic compound on analysis was found to contain 0.032% of sulphur. The molecular mass of the compound. If its molecule contains two sulphur atoms, is

A. 2

B. 3

C. 4

D. 5

Answer: C

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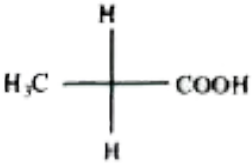
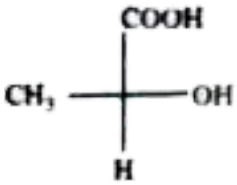
18. Which of the following compounds do not exhibit steroisomerism

A.



B.



C. $CH_3CH = CHCH_3$

D. $CH_3CH = CHCH_2CH_3$

Answer: A

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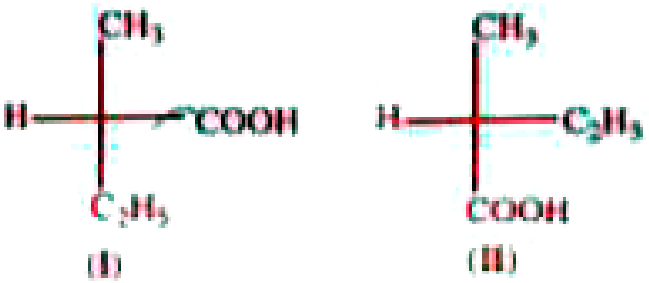
19. Which of the following statements regarding I and II is right



A. I and II identical

B. I and II are enantiomers

C. I and II do not exhibit optical activity

D. I is dextroratory II is leavoratory

Answer: B

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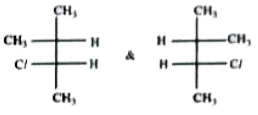
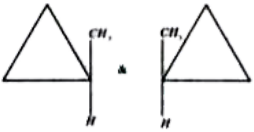
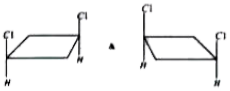
20. Which pair among the following is enantiomers

A. 

B. 

C. 

D. All the above

Answer: A

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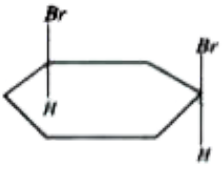
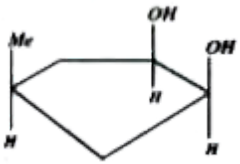
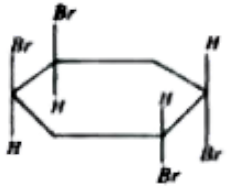
21. Which of the following compound is (meso) compounds?

A. 

B.



C.



D. All

Answer: D

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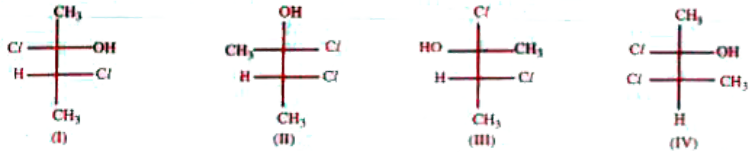
22. Which of the following Fisher projection formulae represents same stereoisomer



A. I, II

B. III & IV

C. I, II, III

D. I, II, III, IV

Answer: D

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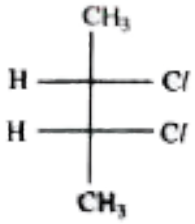
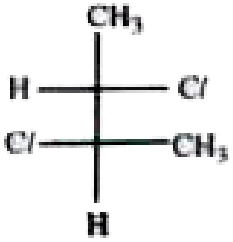
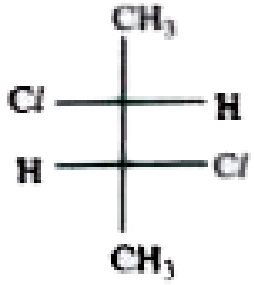
23. Which of the following representation of the Fischer projection formula is the meso isomer of 2, 3 dichlorobutane

A.



B.





C.

D. both (a) and (b)

Answer: D

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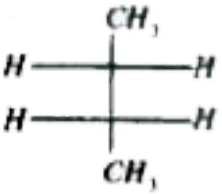
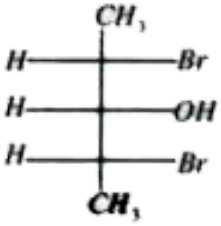
24. Which of the following compounds have plane of symmetry?

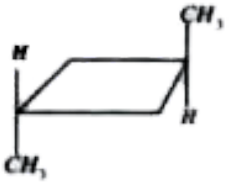


A.

B.



C.



D. all of these

Answer: D

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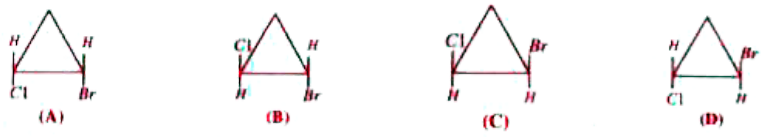
25.



I) (A) and (B) are diastereomers II) (B) and (D) are enantiomers

III) (A) and (D) are geometric isomer IV) (A) and (C) are optical isomer

A. only I is true

B. I, II & III are true

C. I & II are true

D. all are true

Answer: D

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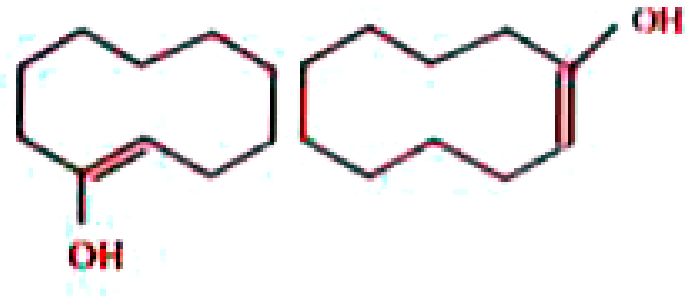
26. Correct relationship between the two structures given below is



A. enantiomers

B. tautormers

C. geometrical isomers

D. constitutional isomers

Answer: C

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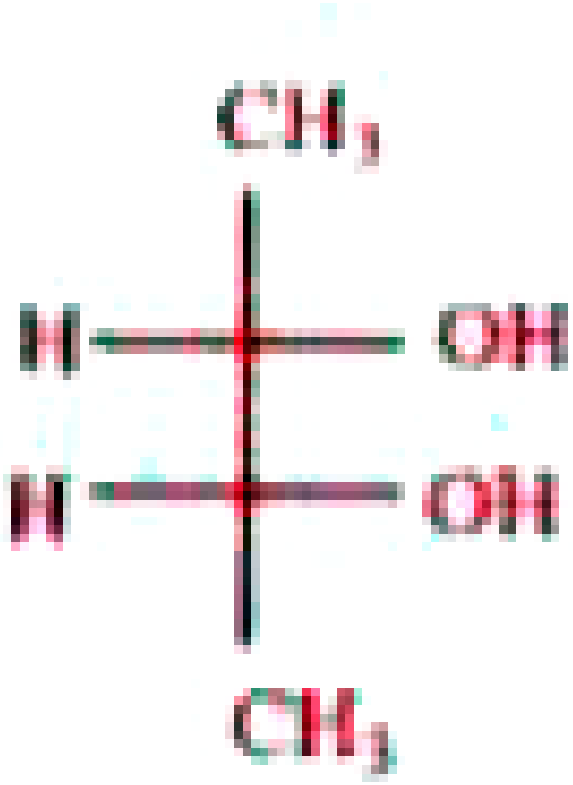
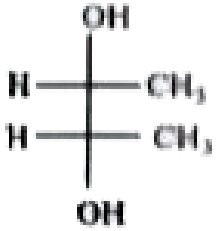
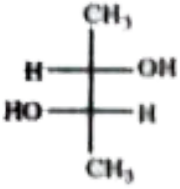
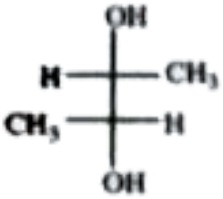
PRACTICE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-1I (ADVANCED) More than one correct answer Type Questions

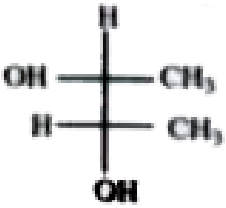
1. Which of the following is the diastereoisomer of



A. 

B. 

C. 

D. 

Answer: B::C::D

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2. 2,3-Butanediol has the 2R, 3R configuration Identify the correct statement among the following.

A. 2R, 3S - is its enantiomers

B. 2S, 3R - is its enantiomers

C. 2S, 3S - is its enantiomers

D. 2S, 3R - Is its diastereoisomer

Answer: C::D

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3. Which of the following is true for a spontaneous process?

A. There are one or more planes of symmetry

B. A single molecule is identical to its mirror image

C. More than one stereogenic centre must be present

D. The stereochemical lables, (R) and (S), must be identical for each sterogenic center

Answer: A::B::C

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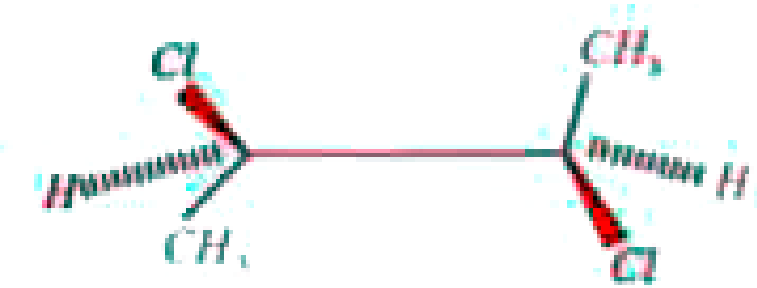
4. Correct statement about



are :

A. compound is optically active

B. compound possess centre of symmetry

C. compound posses bp of symmetry

D. compound possess axis of symmetry

Answer: A::D

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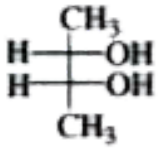
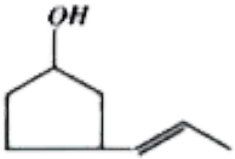
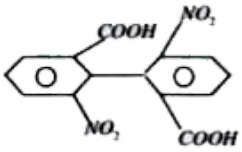
5. How many of the following have chiral centres

A. $H_3C - CH = C = CH - CH_3$

B. 

C. 

D. 

Answer: A::B::C::D

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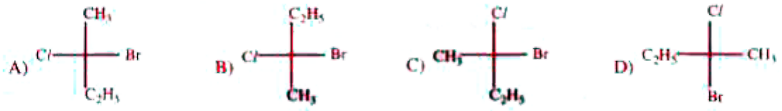
PRACTICE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-1I (ADVANCED) Linked Comprehension Type Questions (Passage - I)

1. The necessary condition for a molecule to exhibit optical isomerism is dissymmetry or chiral. Thus all organic compounds which contain one assymetric carbon atom are chiral and exist in two stereoisomers. Although the two forms have the same structure, they have different arrangements of groups about the assymmetric carbon. In fact, they represent assymetric molecules. They do not have a plane of symmetry. They are related to each other as an object to its miror image and are non superimposable. The two structures actually stand for dextro or (+) and leavo or (-) isomers. Since they are related each other as mirror images, they are commonly called enantiomers.

Consider the following structers A,B,C,D



Which of the following statements is not correctConsider the following structers A,B,C,D

Which of the following statements is not correct

A. B and C are identical

B. A and B are enantiomers

C. A and C are enantiomers

D. B and D are enantiamers

Answer: D

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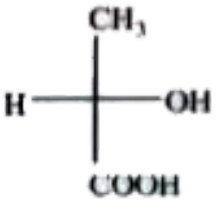
2. The necessary condition for a molecule to exhibit optical isomerism is dissymmetry or chiral. Thus all organic compounds which contain one assymetric carbon atom are chiral and exist in two stereoisomers. Although the two forms have the same structure, they have different arrangements of groups about the assymmetric carbon. In fact, they represent assymetric molecules. They do not have a plane of symmetry. They are related to each other as an object to its miror image and are

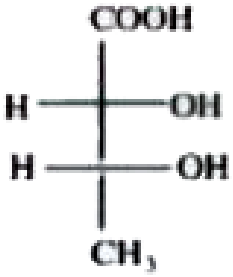
non superimposable. The two structures actually stand for dextro or (+) and leavo or (-) isomers. Since they are related each other as mirror images, they are commonly called enantiomers.

Which of the following compounds is optically inactive

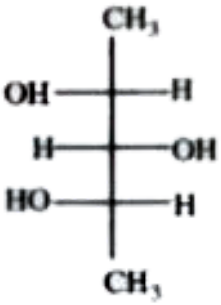
A.



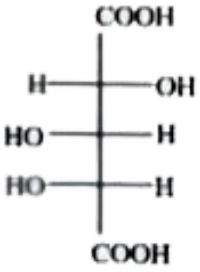
B.



C.



D.



Answer: C

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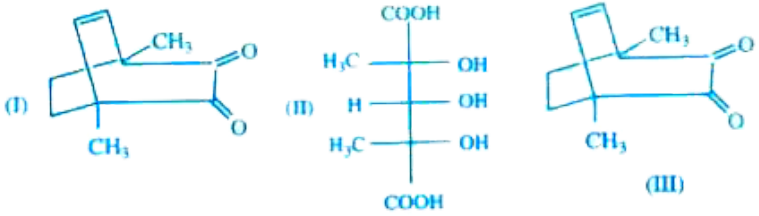
3. The necessary condition for a molecule to exhibit optical isomerism is dissymmetry or chiral. Thus all organic compounds which contain one as symetric carbon atom are chiral and exist in two stereoisomers. Although the two forms have the same structure, they have different arrangements of groups about the as symmetric carbon. In fact, they represent as symetric molecules. They do not have a plane of symmetry. They are related to each other as an object to its mirror image and are non superimposable. The two structures actually stand for dextro or (+) and leavo or (-) isomers. Since they are related each other as mirror images, they are commonly called enantiomers.

Which of the following statements is correct regarding compounds I to III



A. I is an achiral molecule

B. II contain three chiral centers

C. I and III are achiral molecules

D. III contains one chiral centre

Answer: C

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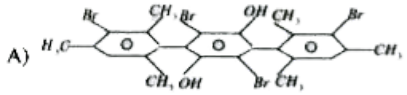
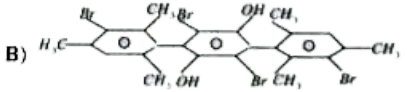
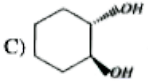
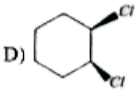
PRACTICE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-1I (ADVANCED) Matrix Matching Type Questions

1. Match the following columns

Column-I (Compound)	Column-II (Nature)
A) 	P) Cis comound
B) 	Q) Trans compound
C) 	R) Optically active
D) 	S) Ooptically inactive

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PRACTICE SHEET EXERCISE-III (Stereo Isomerism) LEVEL-1I (ADVANCED) Integer Type Questions

1. $CH_3 - CH = CH - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - CH_3$ number of racemic mixtures possible for the above compound are

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2. $CH_3 - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - CH_3$ the number of optical isomers possible for this compound are

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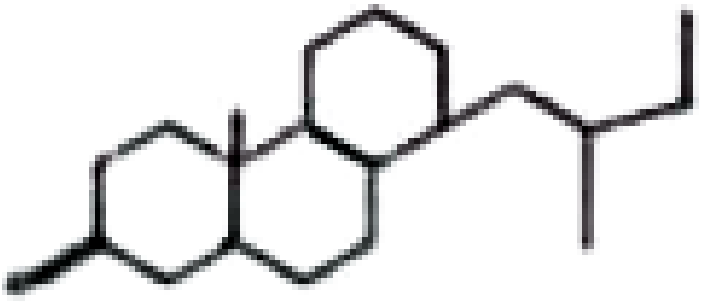
3. No. of chiral centers in the following compound is / are



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4. No. of possible cyclic isomers (including with stereo isomer) for the molecular formulae C_5H_{10}

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ADDITIONAL PRACTICE EXERCISE LEVEL-I (MAIN) Straight Objective Type Questions

1. Isoinerisin exhibited by secondary butyl chloride and tertiary.butyl chloride is

A. Chain isomerism

B. Geometrical isomerism

C. Optical isomerism

D. Positional isomerism

Answer: A

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2. In which of the following species is the underlined carbon having sp^3` hybridisation ?

A. $CH_3\underline{C}OOH$

B. $CH_3\underline{C}H_2OH$

C. $CH_3\underline{C}OCH_3$

D. $CH_2 = \underline{C}H - CH_3$

Answer: B

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3. The general formula $C_nH_{2n}O_2$ could be for open chain

A. Diketones

B. Carboxylic acids

C. Diols

D. Dialdehydes

Answer: B

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4. Of the five isomeric hexanes, the isomer which can give two mono chlorinated compounds is

A. n-Hexane

B. 2,3-Dimethylbutane

C. 2,2-Dimethylbutane

D. 2-Methylpentane

Answer: B

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5. Which one of the following does not have sp^2 hybridized carbon ?

A. Acetone

B. Acetic acid

C. Acetonitrile

D. Acetamide

Answer: C

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6. Number of isomers possible for dichloro cyclohexane

A. 8

B. 9

C. 6

D. 7

Answer: A

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7. Benzaldoxime can exist in two geometrical isomeric forms known as

A. cis and trans

B. dextro and levo

C. syn and anti

D. E and Z

Answer: C

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8. How many structural and geometrical isomers are possible for dimethlcyclohexane?

A. 3, 6

B. 4, 6

C. 6, 4

D. 3, 3

Answer: B

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9. Which of the following can show geometrical isomerism

A. 2,3 - dimethyl butane

B. 2,3-dimethyl-2-butene

C. 1,2 - dimethyl cyclo hexane

D. 2 - methyl pentane

Answer: C

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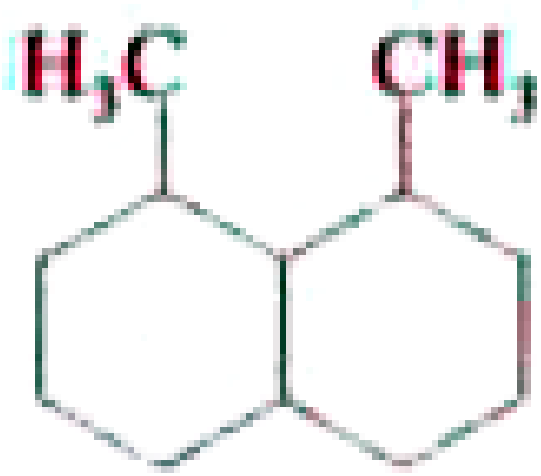
10. Number of chiral centres in the given compound



A. 1

B. 2

C. 3

D. 4

Answer: B

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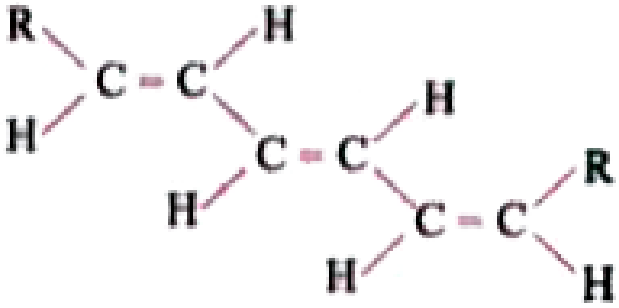
11. Number of the geometrical isomers for the molecule



A. a. 2

B. b. 4

C. c. 6

D. d. 8

Answer: C

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12. Which of the following does not show geometrical isomerism ?

A. 1,2-Dichloro-1-pentene

B. 1,3-Dichloro 2 pentene

C. 1,1-Dichloro-1-pentene

D. 1,4-Dichloro-2-pentene

Answer: C

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13. The alkene that exhibits geometrical isomerism is

A. 2-methyl propene

B. 2-butene

C. 2-methyl-2-butene

D. propene

Answer: B

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14. The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature is

A. $-SO_3H,\ -COOH,\ -CONH_2,\ -CHO$

B. $-CHO,\ -COOH,\ -SO_3H,\ -CONH_2$

C. $-CONH_2,\ -CHO,\ -SO_3H,\ -COOH$

D. $-COOH,\ -SO_3H,\ -CONH_2,\ -CHO$

Answer: D

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15. The number of stereoisomers possible for a compound of the molecular formula $CH_3-CH=CH-CH(OH)-Me$ is

A. 2

B. 4

C. 6

D. 8

Answer: B

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16. Arrange the following compounds in the increasing order of their boiling points:

$(i)CH_3CH=CHCH_3(cis)(ii)CH_3CH=CHCH_3$ (trans)

$(iii)CH_3CH=CHCl$ (cis) $(iv)CH_3CH=CHCl$ (trans)

A. (ii) $<$ (i) $<$ (iii) $<$ (iv)

B. (iv) $<$ (ii) $<$ (i) $<$ (iii)

C. (ii) $<$ (i) $<$ (iv) $<$ (iii)

D. (iii) $<$ (i) $<$ (ii) $<$ (iv)

Answer: C

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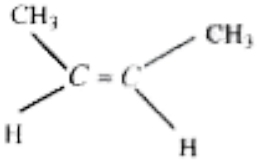
17. Which of the following hydrocarbons has lowest dipole moment?

A. 

B. trans -$CH_3CH = CHCH_3$

C. $CH_3 - CH_2 - C \equiv C - H$

D. $CH_2 = CH - C \equiv CH$

Answer: B

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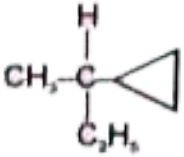
18. Amongst the following compounds, the optically acitve alkane having lowest molecular mass is

A. $CH_3 - CH_2 - CH_2 - CH_3$

B. $CH_3 - CH_2 - \overset{CH_3}{\underset{|}{C}}H - CH_3$



C.

D. $CH_3 - CH_2 - C \equiv CH$

Answer: C

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19. Which of the following compounds is not chiral ?

A. 1-Chloropentane

B. 2-Chloropentane

C. 1-Chloro-2-methylpentane

D. 3-Chloro-2-methylpentane

Answer: A

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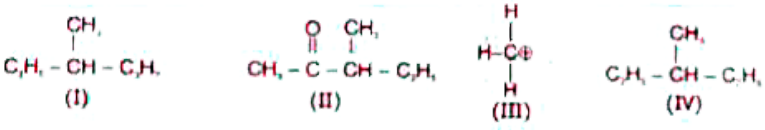
20. Among the following four structures I to IV.



it is true that

A. All four are chiral compounds

B. Only I and II are chiral compounds

C. Only III is a chiral compound

D. Only II and IV are chiral compounds

Answer: B

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21. Racemnic mixture is formed by mixing two

A. Isomeric compounds

B. Chiral compounds

C. Meso compounds

D. Optical isomers

Answer: D

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22. Which of the following will have a meso-isomer also ?

A. 2-Chlorobutane

B. 2,3-Dichlorobutane

C. 2,3-Dichloropentane

D. 2-Hydroxypropanoic acid

Answer: B

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23. Which type of isomerism is shown by 2,3-dichlorobutane ?

A. diastereomerism

B. optical-isomerism

C. geometric-isomerism

D. structural-isomerism

Answer: B

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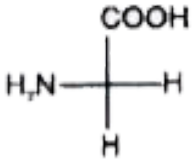
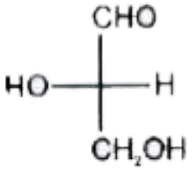
24. Which of the following molecules is expected to rotate the plane of polarized light?

A. 

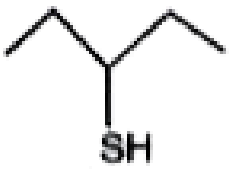
B.



C.



D.



Answer: C

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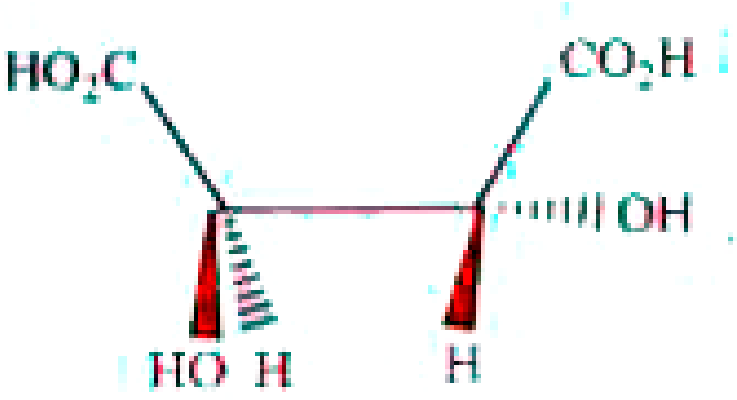
25. The absolute configuration of



A. R, R

B. R, S

C. S, R

D. S, S

Answer: A

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26. Out of the following the alkene that exhibits optical isomerism is

A. 3-methyl-2pentene

B. 4-methyl-1-pentene

C. 3-methyl-1-pentene

D. 2-methyl-2-pentene

Answer: C

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27. Which of the following statements best explain (s) the relationship between two stereoisomers of $CH_3CH = CHCH_3$?

A. They are diastereomers

B. They are enantiomers

C. They are optical isomers

D. Their melting points are identical

Answer: A

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28. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

A. 2

B. 4

C. 6

D. 8

Answer: B

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29. Which of the following molecules can be optically active

A. $CH_2 = C = CH_2$

B. $CH_2 = C = CHCl$

C. $ClCH = C = CHCl$

D. All the above

Answer: C

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30. Butyne and Butadiene are

A. Chain isomers

B. Functional isomers

C. Positional isomers

D. Metamers

Answer: B

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31. The number of geometrical isomers of $CH_3CH = CH - CH - CH = CH - Cl$

A. 2

B. 4

C. 6

D. 8

Answer: D

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32. Which of the following compounds can exhibit geometrical isomerism?

A. 1-phenyl-2-butene

B. 3-phenyl-1--butene

C. 2-phenyl-1-butene

D. 1,1-Diphenyl-1-propene

Answer: A

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33. A similarity between optical and geometrical isomerism is that

A. Each forms equal number of isomers for a given compound

B. If in a compound one is present, then so is the other

C. Both are included in stereo-isomerism

D. They have no similarity

Answer: C

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34. Which of the following compounds exhibits stereo isomerism

A. 2-methyl butene-1

B. 3-methyl butyne-1

C. 3-methyl butanoic acid

D. 2-methyl butanoic acid

Answer: D

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35. A minimum number of C atoms for a saturated hydrocarbon to exhibit optical isomerism (not consid ered isotopes of hydrogen)

A. 4

B. 5

C. 6

D. 7

Answer: D

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36. A compound with molecular formula, C_7H_{16}shows optical isomerism, the compound will be

A. 2, 3-dimethylpentane

B. 2,2-dimethylpentane

C. 2-methylhexane

D. 2,3-dimethylhexane

Answer: A

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37. The number of enantiomers of the compound $CH_3CHBrCHBrCOOH$ is

A. 0

B. 1

C. 3

D. 4

Answer: D

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38. Assertion (A): The boiling point of cis-2-butene is more than trans-2-butene

Reason (R): Cis-2-butene is more polar than trans

A. both A and R are true and R is the correct explanation of A

B. both A and R are true and R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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39. Assertion(A): Lactic acid is optically active compound

Reason (R): It contains a chiral centre with plane of symmetry

A. both A and R are true and R is correct explanation of A

B. both A and R are true and R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C

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40. The chirality of the compounds $H_3C = \overset{\overset{Br}{|}}{\underset{\underset{Cl}{|}}{C}} - H$ is

A. R

B. S

C. E

D. Z

Answer: B

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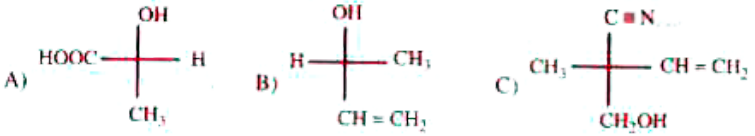
41. The compounds A, B, C have R or S configurations respectively



A. R, R, S

B. R, S, R

C. R, R, R

D. S, R, S

Answer: A

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42. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

A. 2

B. 4

C. 6

D. 8

Answer: B

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43. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

A. 2, 2

B. 1, 1

C. 1, 2

D. 2, 1

Answer: B

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44. Isopentane can form four structurally isomeric mono bromo derivatives. How many of them are cally active?

A. 1

B. 2

C. 3

D. 4

Answer: B

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45. Optically active compounds among the following is

A. $CH_3 - CH_2 - CHCl - CH_2 - CH_3$

B. $CH_3 - CH_2 - CDCl - CH_2 - CH_3$

C. $CH_3 - CH_2 - CHD - CH_2 - CH_3$

D. $CH_3 - CH_2 - CHD - CH_3$

Answer: D

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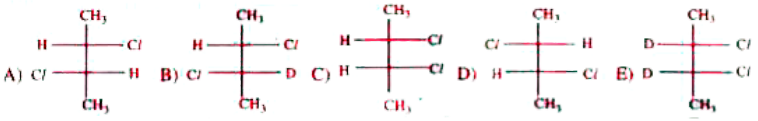
46. Which of the following form diastereomeric pair?



A. A, B

B. B, C

C. A, C

D. D, E

Answer: C

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47. The optical rotation of a solution of pure natural camphor is found to be $+5.76^\circ$ under the following conditions, concentration = 0.13g/ml, length of polarimeter = 1dm, wavelength = sodium D line, $T = 25^\circ C$. The specific rotation of camphor is

A. $+44.3^\circ$

B. $+26.7^\circ$

C. -26.7°

D. -44.3°

Answer: A

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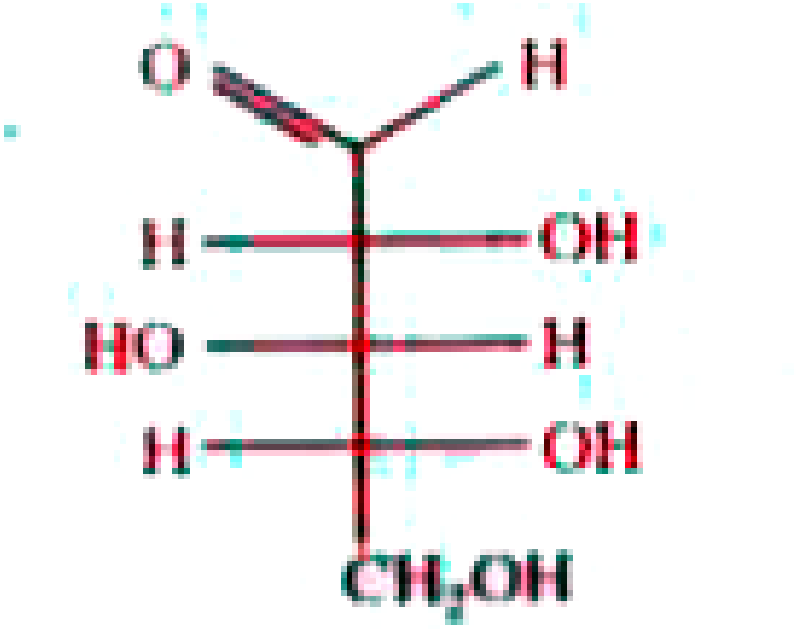
48. The R and S configuration for each sterogenic centre in this from top to bottom?



A. R. R. R

B. R. S. S

C. R. S. R

D. S. S. R.

Answer: C

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49. $C_6H_5 - C - H$ (with $||$ and $: N - OH$) is

A. E-isomer

B. Z- isomer

C. Syn - isomer

D. Anti - isomer

Answer: C

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50. An enantiomerically pure acid is treated with racemic mixture of an alcohol having chiral carbon, The ester formed will be

A. mixture of diastereomers

B. mixture of enantiomers

C. meso compound

D. racemic mixture

Answer: A

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51. Which of the following is correctly matched?

A. tartaric acid-geometrical isomerism

B. fumaric acid-optical isomerism

C. lactic acid optical isomerism

D. malonic acid-geometrical isomerism

Answer: C

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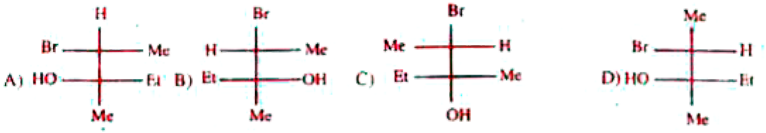
52. Which of the following structures are super imposable?



A. A and B

B. B and C

C. A and D

D. A and C

Answer: D

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53. Type of isomerism not possible with the molecular formula $C_4H_{10}O$ is

A. Chain

B. Optical

C. Functional

D. Geometrical

Answer: D

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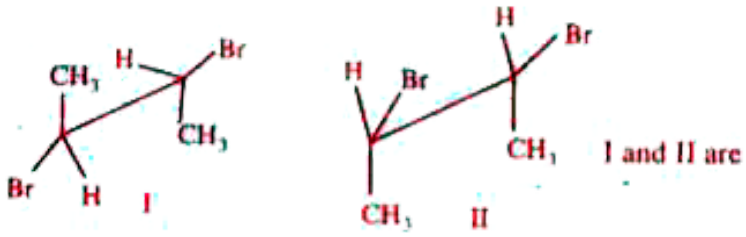
54.



I and II are

A. A pair of optical isomers

B. A pair of conformers

C. A pair of geometrical isomers

D. Identical

Answer: B

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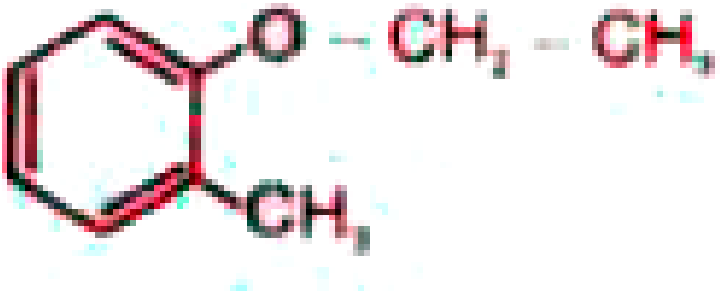
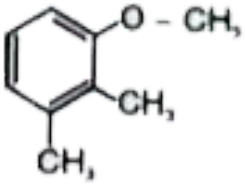
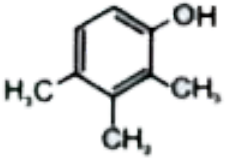
55. Which one is not metamer of



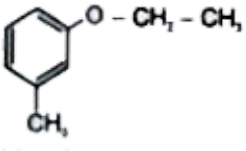
A.

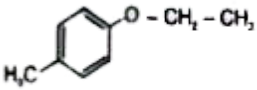


B.



C.





D.

Answer: B

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56. If the recemic mixture of a carboxylic acid is treated with a dextro rotatory amino acid then the products formed are

A. A pair of enantiomers

B. A pair of diastereomers

C. Two optically inactive compounds

D. A mixture of compounds having same melting point and solubility

Answer: B

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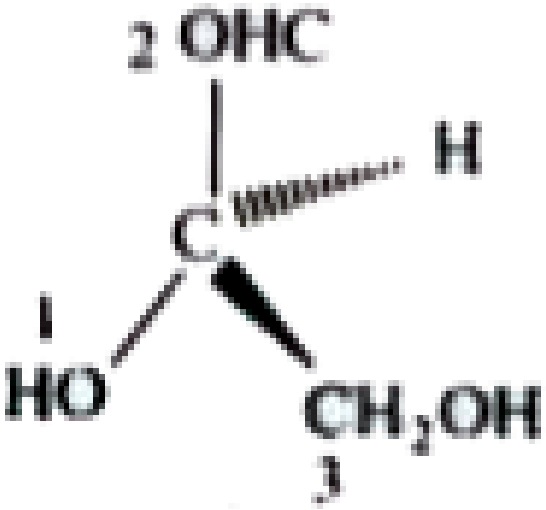
57. The configuration of



A. D & R

B. L & S

C. D & S

D. L & R

Answer: A

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58. Which one of the following can exist in optically active forms?

A. cis-1,3-Dichlorocyclohexane

B. trans-1,3-Dichlorocyclohexane

C. cis-1,4-Dichlorocyclohexane

D. trans-1,4-Dichlorocyclohexane

Answer: B

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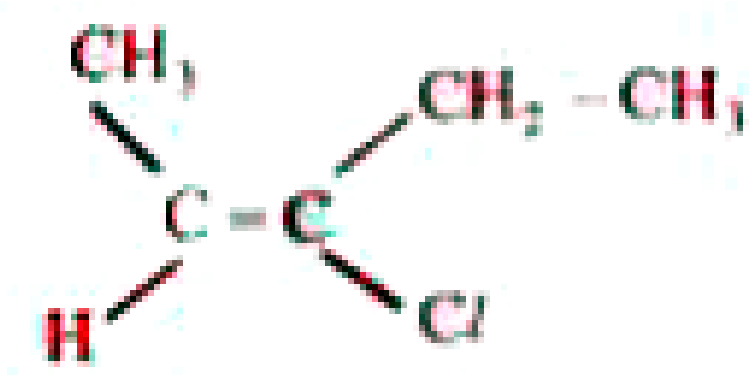
59. The name of the molecule shown is



A. cis-3-choro-2-pentene

B. monochloro-2-cis-pentene

C. trans-3-chloro-2-pentene

D. cis-3-chloro-3-pentene

Answer: A

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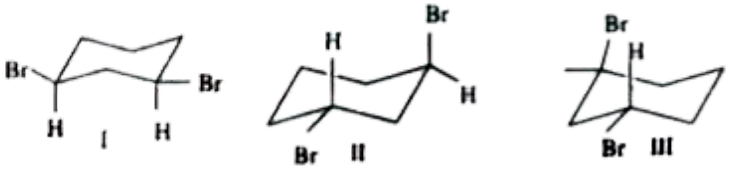
60. cis-1,3-Dibromocyclohexane is represented by structure(s):



A. I

B. II

C. III

D. II and III

Answer: A

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61. For the compound with molecular, formula $C_3H_5Br_3$. The number of optically active stereo isomers and total number of isomer are respectively

A. 2 and 6

B. 1 and 5

C. 2 and 4

D. 2 and 5

Answer: A

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62. Ortho nitro phenol and paranitro phenol are

A. Cis-trans isomerism

B. E, Z configuration

C. Positional isomerism

D. Tautomerism

Answer: C

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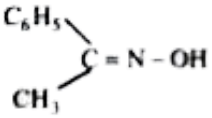
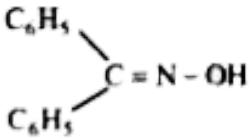
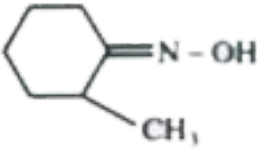
63. Which of the following oximes is expected to exhibit both geometrical and optical isomerism

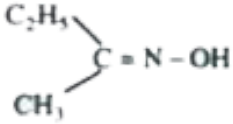
A. 

B. 

C.



D.



Answer: C

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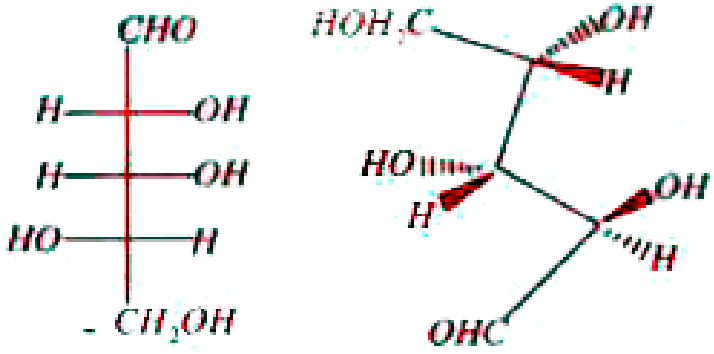
64. How are the following compounds related?



A. Enantiomers

B. Diastereo mers

C. Epimers

D. They are identical

Answer: D

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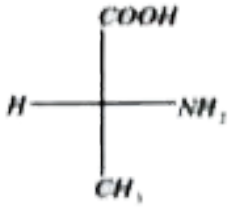
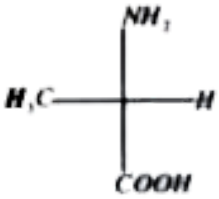
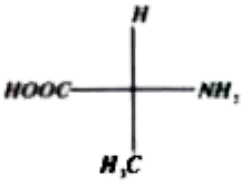
65. R-alanine is represented by



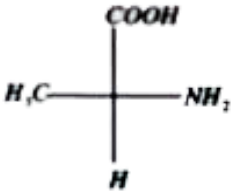
A.



B.



C.



D.

Answer: A

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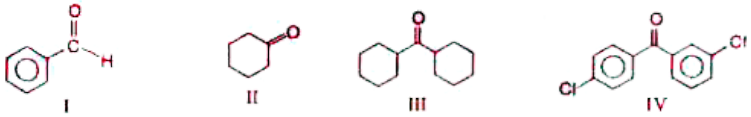
66. Which of the following will form only one oxime on reaction with NH_2OH solution.



A. I, II

B. II, III

C. I, IV

D. II, III, IV

Answer: B

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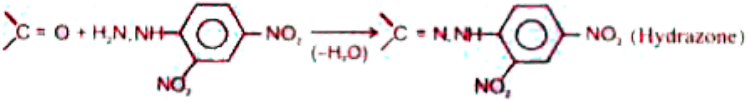
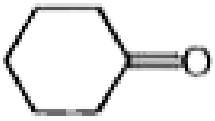
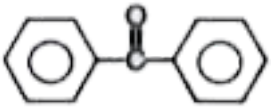
67. Ketones and aldehydes form water insoluble crystalline solids with phenylhydrazines as shown by the following reaction.

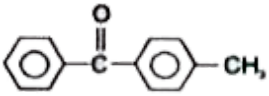


(Hydrazone) Which of the following compounds will produce a mixture of two diastereomeric hydrazones ?

A. 

B. CH_2O

C. 

D. 

Answer: D

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68. The optically active tartaric acid is named as D-(+)-tartaric acid because it has a positive.

A. optical rotation and is derived from D-glucose

B. pH in organic solvent

C. optical rotation and is derived from D-(+)-glyceraldehyde

D. optical rotation only when substituted by deuterium

Answer: C

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69. Optical activity is shown by a molecule which

A. Contains at least three asymmetric centres

B. Is asymmetric as a whole

C. Contains a double bond

D. Has a centre of symmetry

Answer: B

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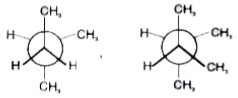
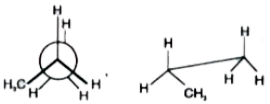
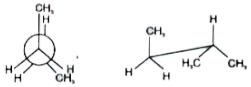
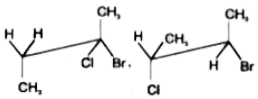
70. Which of the following pair is represent identical compound ?

A. 

B. 

C. 

D. 

Answer: B

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71. Compound

is a projection formula of:

A. Cyclohexane

B. Cyclopentane

C. Cyclobutane

D. Cyclopropane

Answer: D

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ADDITIONAL PRACTICE EXERCISE LEVEL II LECTURE SHEET (ADVANCED) More than one correct answer Type Questions

1. Which of the following have zero dipole moment?

A. p-Dichlorobenzene

B. Benzene-1, 4-diol

C. Fumaric acid

D. Maleic acid

Answer: A::C

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2. Which of the following statements is/are not correct?

A. Metamerism belongs to the category of structural isomerism

B. Tautomeric structures are the resonating structures of a molecule

C. Keto form is always more stable than the enol form

D. Geometrical isomerism is shown only by alkenes

Answer: B::C::D

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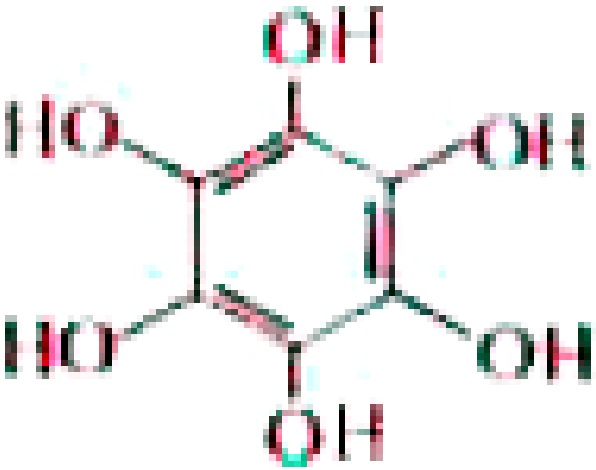
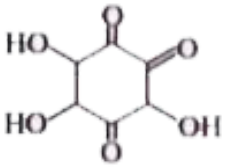
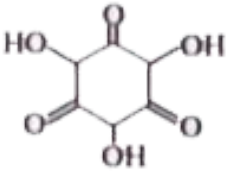
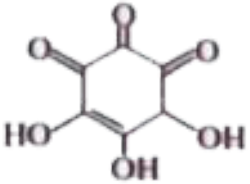
3. Tautomerism form of this compound is/are:



A. 

B. 

C. 

D. All of these

Answer: A::B

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4. Which of the following statements regarding 2-butene is / are right

A. It exists in two geometrical isomers

B. The two geometrical isomers have different boiling points

C. Hydrogenation is presence of Ni gives same alkane

D. The two geometrical isomers are diastereoisemers

Answer: A::B::C::D

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5. About meso tartaric acid which of the following statements is/are not correct

A. It is optically inactive due to internal compensation

B. It can be separated into two optically active isomers

C. It cannot be separated into two optically active isomers

D. It is optically inactive due to external compensation

Answer: A::B::D

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6. Which pair does represent isomers?

A. CH_3COOH and $HCOOCH_3$

B. $CH_3 - CHO$ and $CH_2 = CH - OH$

C. $CH_3 - CHO$ and $CH_3 - CO - CH_3$

D. $CH_3 - CO - CH_3$ and $CH_3 - CH_2 - CHO$

Answer: A::B::D

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7. The molecule $H_3C - CH = CH - \underset{CH_3}{\overset{|}{C}}H - COOH$ can exhibit

A. Geomelical isomer only

B. Optical isomerism only

C. Conformational and optical isomerism

D. Tautomerism

Answer: A::B

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8. Which of the following statements is /are incorrect about two organic compounds which are stereoiso iners?

A. They must be enantiomers

B. They must be diastereomers

C. They must be constitutional isomers

D. They must have same molecular formula

Answer: A::B::C

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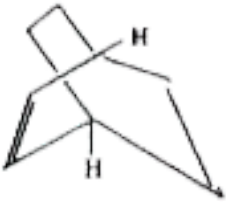
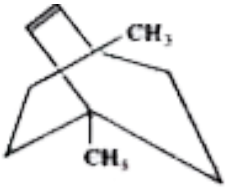
9. In which of the following molecules chiral centre(s) is/are not present

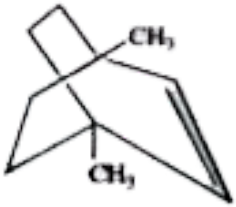
A.



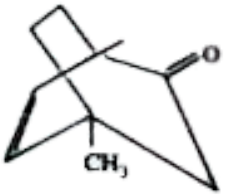
B.



C.



D.



Answer: A::B::C

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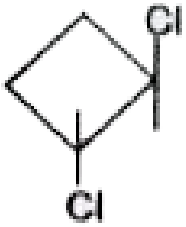
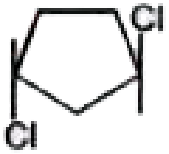
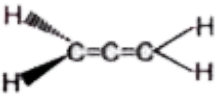
10. Mark out the optically active molecule :

A. 

B. 

C. 

D. 

Answer: A::B::D

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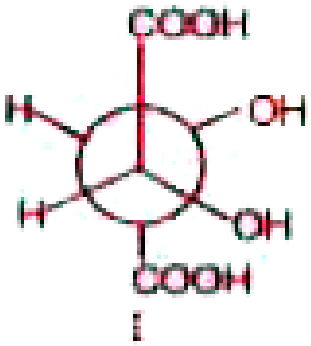
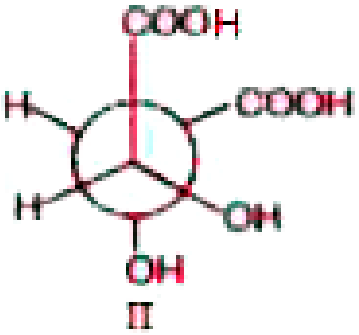
11. The structures I and II are :



I



II

A. Conformational diastereomers

B. Configurational enantiomers

C. Configurational diastereomers

D. Identical

Answer: C

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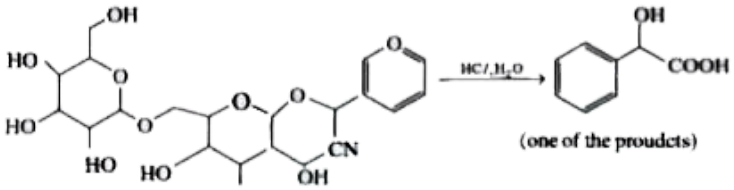
ADDITIONAL PRACTICE EXERCISE LEVEL II LECTURE SHEET (ADVANCED) Linked Comprehension Type Questions (Passage - I)

1. Amygdalin, a compound isolated from the pits of apricots, peaches and wild cherries. Although it has no known therapeutic value, it has been used as unsanctioned anticancer drug. One hydrolysis product formed from Amygdalin is mandelic acid used in common skin problems.



Number of stereogenic centers present in (A)

A. a. 10

B. b. 11

C. c. 12

D. d. 13

Answer: C

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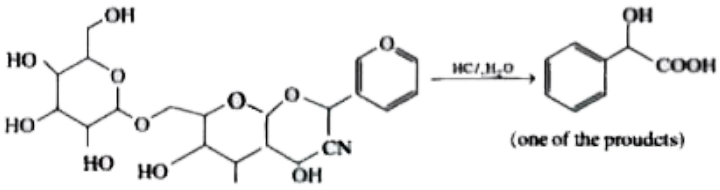
2. Amygdalin, a compound isolated from the pits of apricots, peaches and wild cherries. Although it has no known therapeutic value, it has been used as unsanctioned anticancer drug. One hydrolysis product formed from Amygdalin is mandelic acid used in common skin problems.



Pure (R)-mandelic acid has specific rotation of -154 and sample contains 60% of (R) isomer and 40 % of its enantiomer. $[\alpha]$ of mixture is

A. $+31^{\circ}$

B. -31°

C. $+62^{\circ}$

D. -62°

Answer: B

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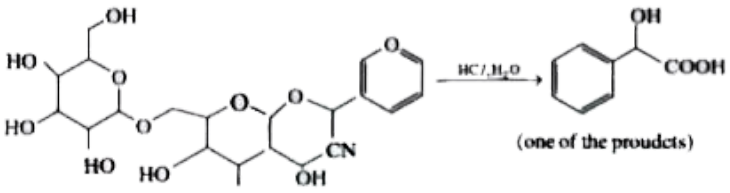
3. Amygdalin, a compound isolated from the pits of apricots, peaches and wild cherries. Although it has no known therapeutic value, it has been used as unsanctioned anticancer drug. One hydrolysis product formed from Amygdalin is mandelic acid used in common skin problems.



If $[\alpha]$ of solution of mandelic acid is + 50.56 , the ee% will be

A. enantiomeric excess of solution is 50%

B. enantiomeric excess of solution is 60%

C. enantiomeric excess of solution is 32%

D. enantiomeric excess of solution is 80%

Answer: C

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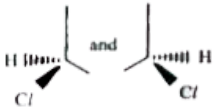
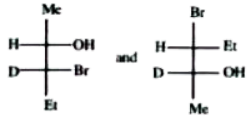
ADDITIONAL PRACTICE EXERCISE LEVEL II LECTURE SHEET (ADVANCED) Linked Comprehension Type Questions (Passage - II)

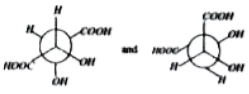
1. Structural isomers have different covalent linkage of atoms. Stereoisomers are compounds that have same sequence of covalent bonds but differ in the relative dispositions of their atoms in space. Geometri cal and optical isomers are the two important types of configurational isomers. The compound with double bonds or ring structure have restricted rotation, so exist in two geometrical forms. The double bonds in larger rings (ring size 10 carbon large) can also cause geometrical isomerism. The optical isomers rotate the plane of plane-polarised light. A sp^3-hybridised carbon atom bearing four different types of substituents is called an asymmetric centre or chiral centre. A chiral object or molecule cannot be superimposed on its mirror image. Stereoisomers that are mirror images of each other are called enantiomers. The stereosomers that the pot mirror images of each other are called diastereomers. Diasteremers have different physical properties. A racemic mixture is optically inactive and contains equal amounts of both the enantiomers. Resolution refers to method of separating a

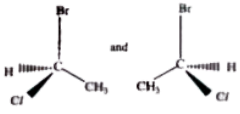
racemic mixture. Into two pure enantiomers. A meso compound is an optically inactive stereoisomer, which is achiral due to the presence of an internal plane of symmetry or centre of symmetry within the molecule.

The pair of the following that showing identical species is

A. 

B. 

C. 

D. 

Answer: A

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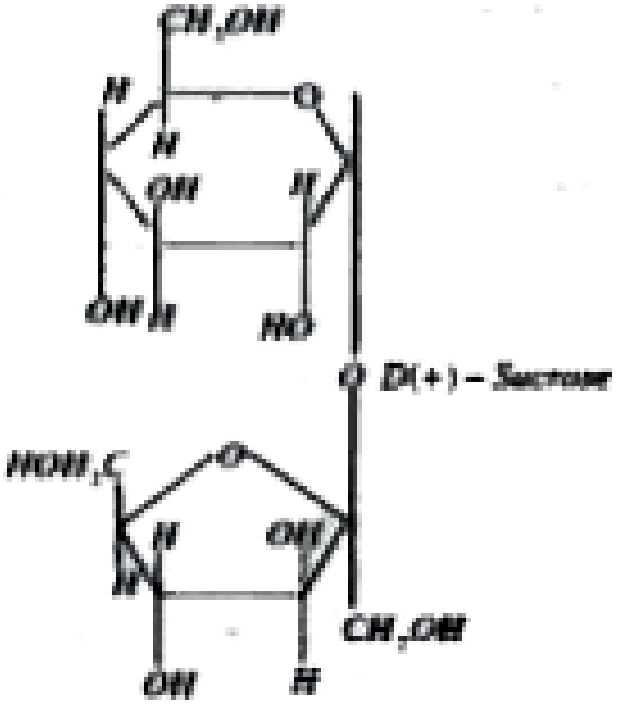
2. Structural isomers have different covalent linkage of atoms. Stereoisomers are compounds that have same sequence of covalent

bonds but differ in the relative dispositions of their atoms in space. Geometri cal and optical isomers are the two important types of configurational isomers. The compound with double bonds or ring structure have restricted rotation, so exist in two geometrical forms. The double bonds in larger rings (ring size 10 carbon large) can also cause geometrical isomerism. The optical isomers rotate the plane of plane-polarised light. A sp^3-hybridised carbon atom bearing four different types of substituents is called an asymmetric centre or chiral centre. A chiral object or molecule cannot be superimposed on its mirror image. Stereoisomers that are mirror images of each other are called enantiomers. The stereosomers that the pot mirror images of each other are called diastereomers. Diasteremers have different physical properties. A racemic mixture is optically inactive and contains equal amounts of both the enantiomers. Resolution refers to method of separating a racemic mixture. Into two pure enantiomers. A meso compound is an optically inactive stereoisomer, which is achiral due to the presence of an internal plane of symmetry or centre of symmetry within the molecule.

The number of chiral centres present in the following compounds is



A. 7

B. 8

C. 9

D. 10

Answer: C

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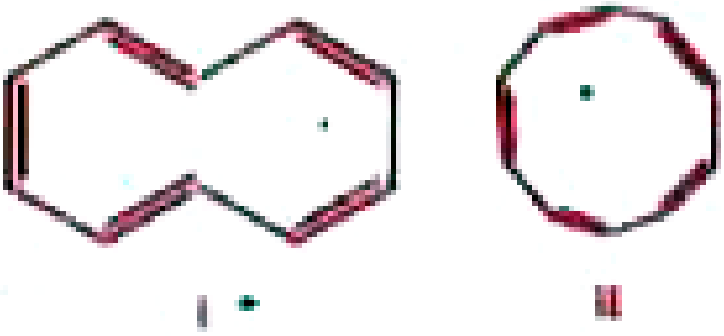
3. Structural isomers have different covalent linkage of atoms. Stereoisomers are compounds that have same sequence of covalent bonds but differ in the relative dispositions of their atoms in space. Geometri cal and optical isomers are the two important types of configurational isomers. The compound with double bonds or ring structure have restricted rotation, so exist in two geometrical forms. The double bonds in larger rings (ring size 10 carbon large) can also cause geometrical isomerism. The optical isomers rotate the plane of plane-polarised light. A sp^3-hybridised carbon atom bearing four different types of substituents is called an asymmetric centre or chiral centre. A chiral object or molecule cannot be superimposed on its mirror image. Stereoisomers that are mirror images of each other are called enantiomers. The stereosomers that the pot mirror images of each other are called diastereomers. Diasteremers have different physical properties. A racemic mixture is optically inactive and contains equal amounts of both the enantiomers. Resolution refers to method of separating a racemic mixture. Into two pure enantiomers. A meso compound is an optically inactive stereoisomer, which is achiral due to the presence of an

internal plane of symmetry or centre of symmetry within the molecule.

The following two compounds are



A. Identical

B. Conformational isomers

C. Geometrical isomers

D. Structural isomers

Answer: C

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ADDITIONAL PRACTICE EXERCISE LEVEL II LECTURE SHEET (ADVANCED) Matrix Matching Type Questions

1.

Column-I	Column-II
A) C_7H_{16}(No. of structural isomers)	P) 6
B) C_2FCl Br I(No. of structural isomers)	Q) 3
C) C_6H_4 Br Cl(No. of Benzonoid Aromatic isomers)	R) 5
D) C_5H_{10}No. of cyclic isomers)	S) 9

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2.

Column-I (Benzene derivative)	Column-II (No. of isomers Theoreti
A) Dichloroborazine	P) 3
B) Bromochloroborazine	Q) 4
C) Trichlorobenzene	R) 6
D) Bromodichlorobenzene	S) 8

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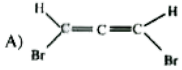
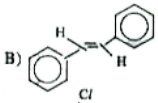
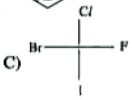
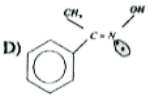
3. Match the following columns

Column-I	Column-II
A) 	P) Chiral centers containing compound
B) 	Q) Presence of stereocenter
C) 	R) Optically active compound
D) 	S) Compound containing plane of symmetry

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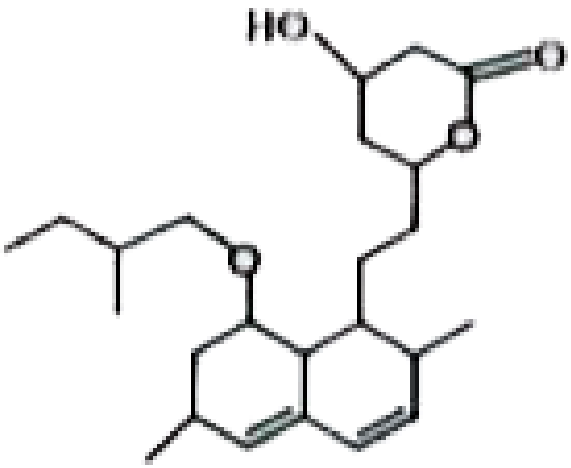
ADDITIONAL PRACTICE EXERCISE LEVEL II LECTURE SHEET (ADVANCED) Integer Type Questions

1. How many sterogenic centers are there in Lovastain (Mevacor(R): a cholsesterol-lowering drug?



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2. Identify how many chiral atoms are present in the following well known compound called cholesterol

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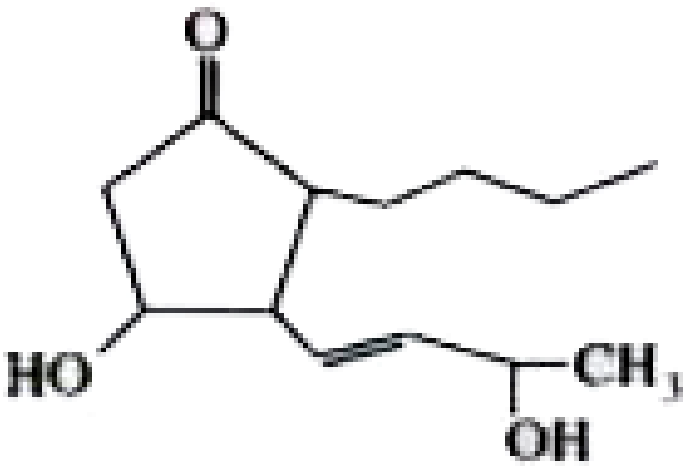
3. How many steriogenic centre is present for the given structure



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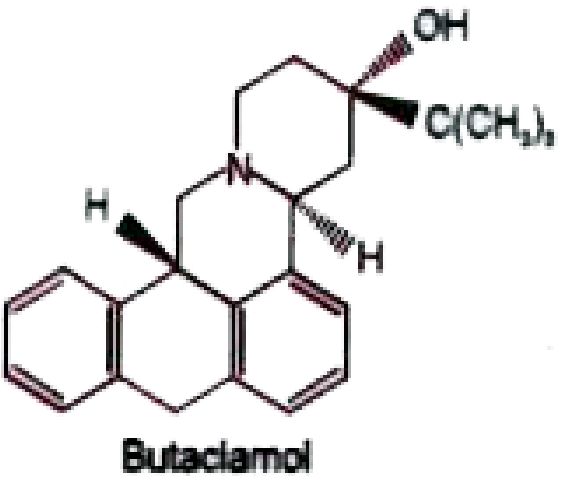
4. Butaclamol is potent antipsychotic that has been used clinically in the treatment of schizophrenia. Although patients are given a racemic mixture of the drug, only the (+)-enantiomer has pharmacological activity.

How many chirality centres does butaclamol have ?



Butaclamol

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5. No. of possible isomeric dioic acids for the molecular formulae $C_4H_4O_4$ are

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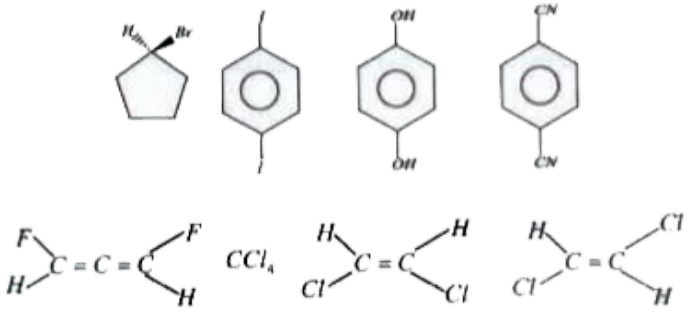
6. No. of compounds having net dipole moment are



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7. Find the number of enantiomeric pairs that can be produced during the monochlroination of n-pentane is

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8. No. of possible cyclic isomers (including with stereo isomer) for the molecular formulae C_5H_{10}

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9. The minimum number of carbon atoms to be present in a carboxylic acid to exhibit optical activity is

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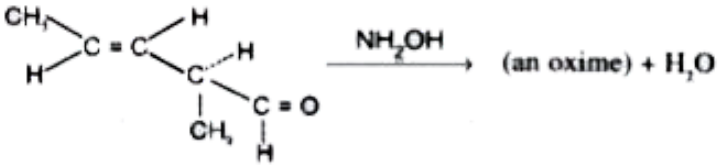
10. Find the possible number of stereoisomers formed in the following reaction would be :



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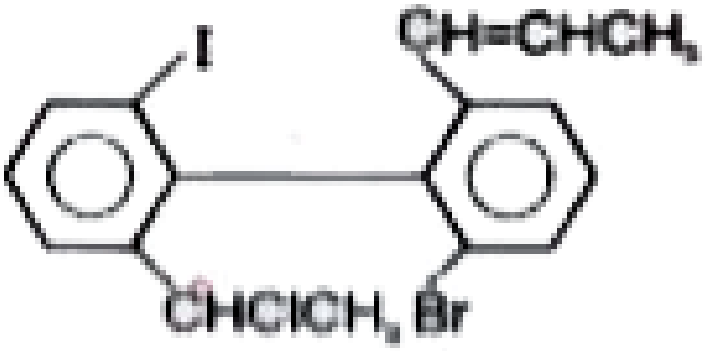
11. How many spatial orientations are possible in the following compound ?



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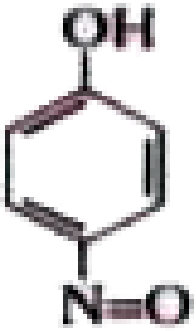
PRACTICE SHEET (ADVANCED) More than one correct answer Type Questions

1. Which compound show tautomerism:

A.

B.

C.



D. None of these

Answer: A::C

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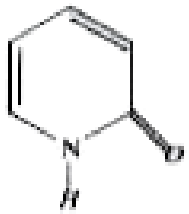
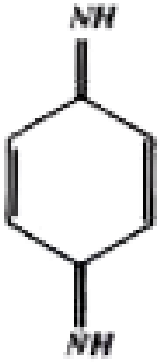
2. Which of the following compounds exhibits Tautomerism

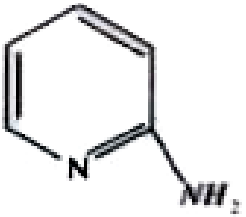


A.



B.

C.



D.

Answer: A::C::D

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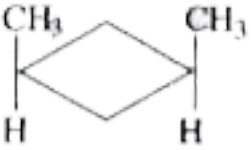
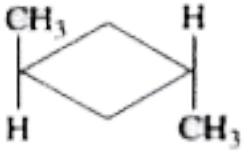
3. Which of the following niolecule does not contain chiral centre (s)

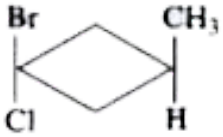
A.



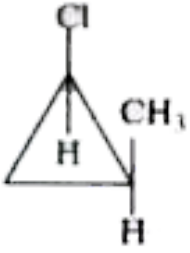
B.



C.



D.



Answer: A::B::C

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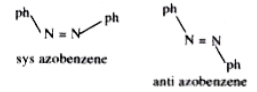
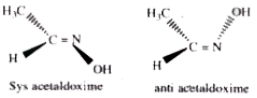
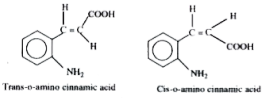
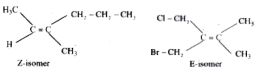
4. For which of the following pairs of compounds are the CORRECT notation given

A. 

B. 

C. 

D. 

Answer: A::B::C

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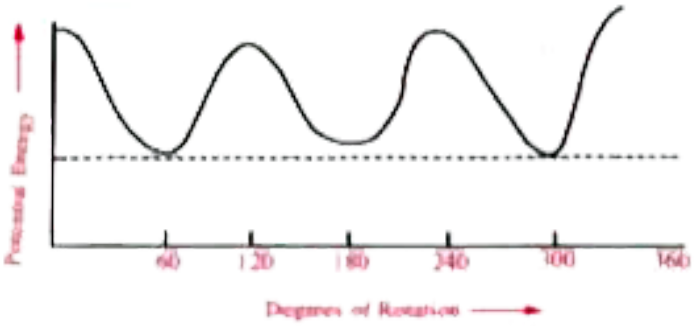
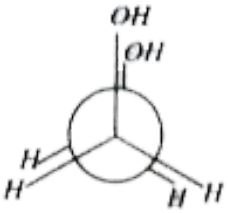


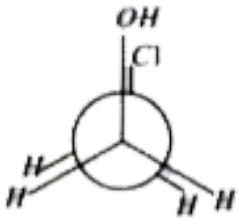
5.

Configuration structure of which compound (s) correctly predict the potential energy diagram.

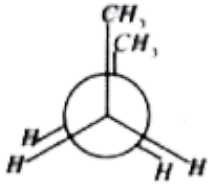
A.

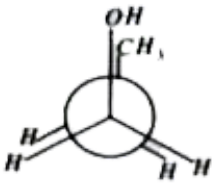


B.



C.



D. 

Answer: A::B

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6. Which of the following statement is right

A. R and S configurational isomers of a compound are enantiomers

B. D and L configurational isomers of a compound are enantiomers

C. cis-2-butene and trans-2-butene are a pair of diastereoisomers

D. All the E-isomers are trans-isomers

Answer: A::B::C

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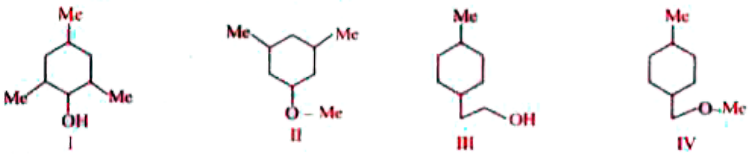
7. Which of the following is not the correct relationship



A. II & IV are metamer

B. I & II are functional isomer

C. I & III are chain isomer

D. I and IV are positional isomer

Answer: A::D

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8. Which of the following alkanes give only one mono-chloro derivative

A. 2, 3-dimethylbutane

B. Cyclohexane

C. 2, 2-dimethylpropane

D. Ethane

Answer: B::C::D

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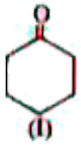
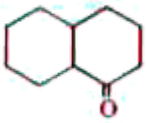
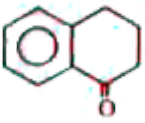
9. The correct order of % enol content.



(I)



(II)



(III)

A. III $>$ I

B. III $>$ II

C. II $>$ I

D. I $>$ II

Answer: A::B::D

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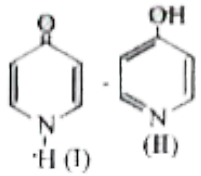
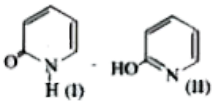
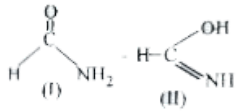
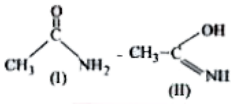
10. In Which of the following pairs I is more stable than II ?

A. 

B. 

C. 

D. 

Answer: A::B::C::D

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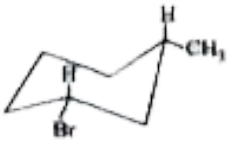
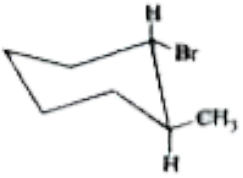
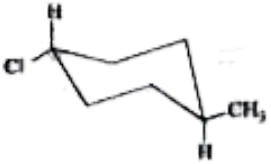
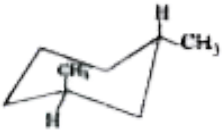
11. Determine which of the following compounds is a trans isomer.

A. 

B. 

C. 

D. 

Answer: A::B::D

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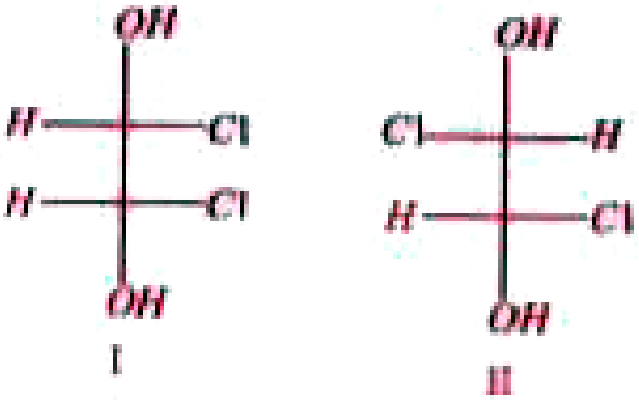
12. Which of the following statements regarding the Fischer projection formulae given here is right



A. I & II are constitutional isomers

B. I and II are stereoisomers

C. I and I are diastereoisomers

D. Both have same IUPAC name

Answer: B::C::D

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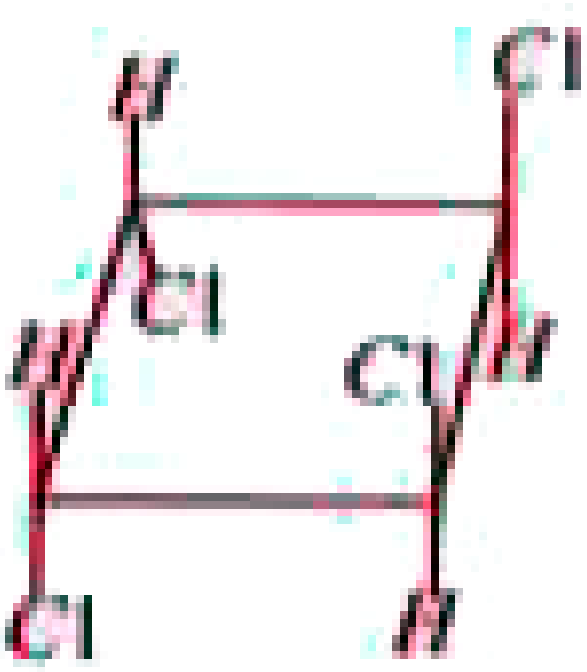

13.

is optically inactive due to the presence of

A. centre of symmetry

B. plane of symmetry

C. axis of symmetry

D. none of the above

Answer: A::B

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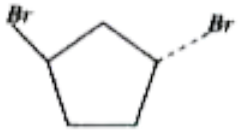
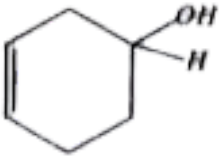
14. Which of the following molecules are chiral

A.

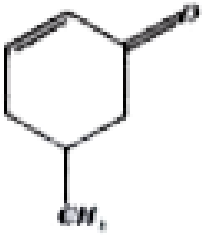


B.



C.

D.



Answer: A::B::D

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PRACTICE SHEET (ADVANCED) Linked Comprehension Type Questions (Passage - I)

1. Constitutional isomerism is also known as structural isomerism. The isomers which differ in the connectivity of their atoms are called constitutional isomers.

Which pair is correctly matched?

A. n-butane and isobutane, metamers

B. 2-pentanol and 3-pentanol, position isomers

C. Cyclohexene and cyclopentene, chain isomers.

D. methyl propyl ether and diethyl ether, functional isomers

Answer: B

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2. Constitutional isomerism is also known as structural isomerism. The isomers which differ in the connectivity of their atoms are called constitutional isomers.

Which of the compound will show tautomerism?

A. acetoxime

B. cyclohexanol

C. cyclohexanone

D. hexanol

Answer: C

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PRACTICE SHEET (ADVANCED) Linked Comprehension Type Questions (Passage - II)

1. Geometrical Isomerism Molecules having same molecular formula but differing in the orientation of atoms in a space due to resistricted

rotation.

Compound which do not exhibit geometric isomerism

A. ether

B. 2-butene

C. 3, 4 dimethyl-3-haxcne

D. 2-chloru - 3-methyl - 2-pentene

Answer: A

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PRACTICE SHEET (ADVANCED) Integer Type Questions

1. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

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2. $CH_3 - CH = CH - \underset{OH}{CH} - \underset{OH}{CH} - CH_3$ number of streoisomers are

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3. The number of isomeric compounds having a benzene ring and molecular formula C_7H_9N are____

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4. How many structural isomers are possible with C_7H_8O?

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5. $CH_3 - CH = C = C = CH_2$ How many geometrical isomers of this triene are possible____

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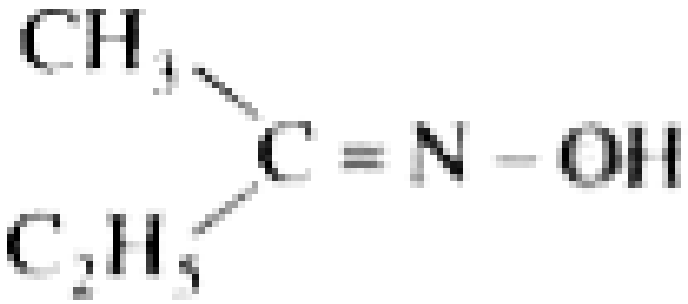

6.

number of geometrical isomers possible for this oxime is

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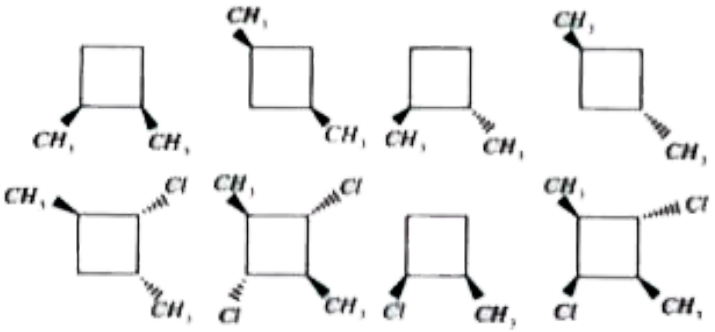
7. No. of chiral molecules from the below given compounds are



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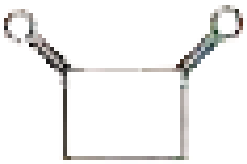
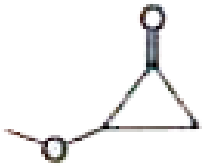
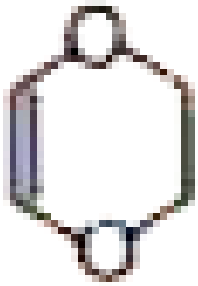
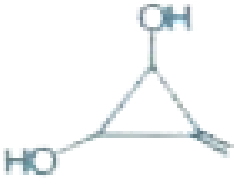
LECTURE SHEET (EXERCISE-I (STRAIGHT OBJECTIVE TYPE QUESTIONS))

1. Which of the following is heterocyclic compound ?

A. 

B. 

C. 

D. 

Answer: C

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2. The total no. of possible dichloro derivatives of isobutene are :

A. 2

B. 4

C. 5

D. 6

Answer: C

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3. How many structural formulas are possible when one of the hydrogen is replaced by a chlorine atom in anthracene?

A. a. 3

B. b. 7

C. c.. 4

D. d. 6

Answer: A

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4. Number of structural isomers which can be obtained theoretically on monochlorination of 2-methylbutane is

A. 1

B. 2

C. 3

D. 4

Answer: D

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5. Find the number of dibromo derivatives of molecular formula $C_3H_6Br_2$ is

A. 4

B. 2

C. 6

D. 8

Answer: A

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6. C_7H_7Cl shows how many benzenoid aromatic isomers ?

A. 4

B. 3

C. 5

D. 6

Answer: A

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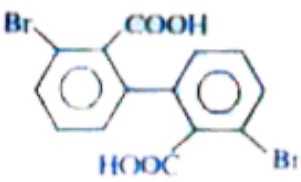
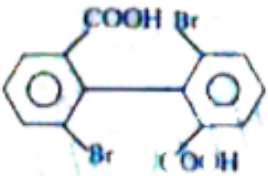
7.  and  are

A. Positional

B. Chain

C. Geometrical

D. Functional

Answer: A

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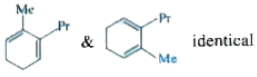
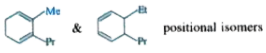
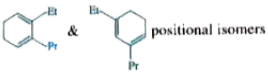
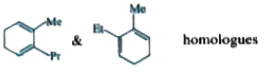
8. Which of the following has incorrect relation

A. 

B. 

C. 

D. 

Answer: B

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9. The number of primary alcohol isomers with the formula $C_4H_{10}O$ is

A. 1

B. 2

C. 3

D. 4

Answer: B

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10. The number of structural isomers obtained by mono-halogenation of propane is

A. two

B. three

C. four

D. five

Answer: A

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11. Which of the following statements regarding compounds having molecular C_5H_8 is right

A. It can be an open chain compound having one double bond

B. It can be an open chain compounds with two double bonds

C. It can be a saturated cyclic compound

D. It can be unsaturated bicyclic compound

Answer: B

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12. The number of isomers of the aromatic compound C_8H_{10} are :

A. 3

B. 4

C. 2

D. 5

Answer: B

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13. The total number of isomers (containing benzene ring) of molecular formula C_7H_8O is :

A. 2

B. 3

C. 4

D. 5

Answer: D

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14. $C_6H_4Cl_2 + Cl_2 \xrightarrow{Fe} C_6H_3Cl_3$ Only one structural isomer of Y is formed. Hence, (X) is.

A. o-isomer

B. p - isomer

C. m-isomer

D. Any of these

Answer: B

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15. The number of isomeric primary amines possible for the formula C_3H_9N

A. 2

B. 3

C. 5

D. 6

Answer: A

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16. The total number of structural isomers possible for hydrocarbon C_5H_{10} is:

A. 9

B. 10

C. 11

D. 12

Answer: B

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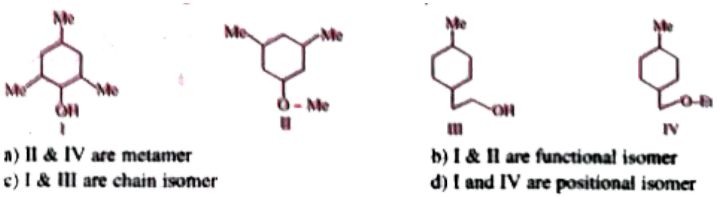
17. Which of the following is not the correct relationship



a) II & IV are metamer
b) I & II are functional isomer
c) I & III are chain isomer
d) I and IV are positional isomer

A. II & IV are metamer

B. I & III are chain isomer

C. I & II are functional isomer

D. I and IV are positional isomer

Answer: D

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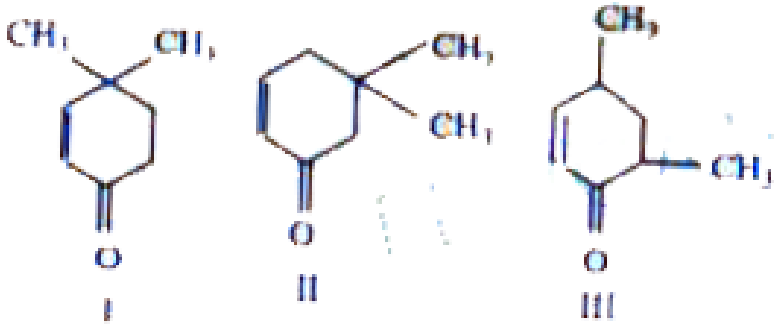
18. 

Which among these can exhibit tautomerism?

A. I and II

B. I and III

C. II and III

D. all

Answer: D

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19. Which of the following molecules contain more enol content at equilibrium

A. $OHC - CH_2 - CHO$

B. $CH_3COCH_2COOCH_3$

C. $CH_2(COOH)_2$

D. CH_3COCH_3

Answer: A

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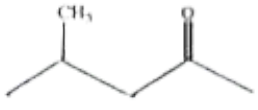
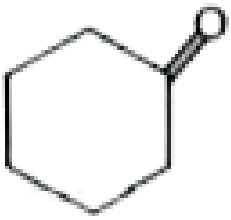
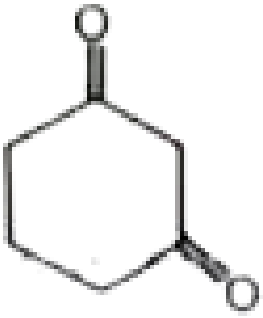
20. Which of the following contains maximum enol form ?

A. 

B. 

C. 

D. 

Answer: C

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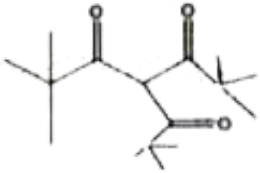
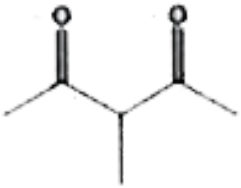
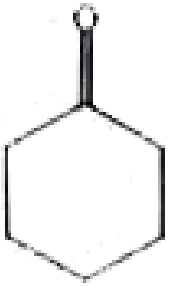
21. The one with maximum enol content is

A. 

B. 

C. 

D. 

Answer: A

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22. Choose the correct enol content order of the following compounds in their pure liquid state

I) CH_3COCH_3 II) $CH_3COCH_2COOC_2H_5$ III) $C_6H_5COCH_2COOC_2H_5$ IV) $CH_3COCH_2COCH_3$ V) $C_6H_5COCH_2COCH_3$

A. II gt III gt IV gt I gt V

B. III gt II gt I gt V gt IV

C. V gt IV gt III gt II gt I

D. V gt III gt IV gt II gt I

Answer: C

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LECTURE SHEET (EXERCISE-I (MORE THAN ONE CORRECT ANSWER TYPE QUESTIONS))

1. The formula $C_4H_{11}N$ represents

A. Four p-amines

B. three s-amines

C. two s-amines

D. one t-amine

Answer: A::B::D

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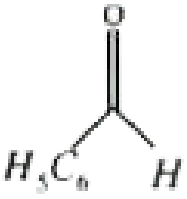
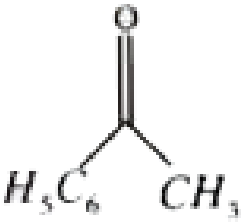
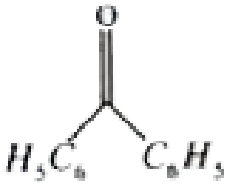
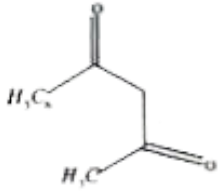
2. keto-enol tautomerism is observed in

A. 

B. 

C. 

D. 

Answer: B::D

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3. Only two isomeric mono chloro derivatives are possible for

A. n-butane

B. 2,3-dimethylbutane

C. benzene

D. 2-methyl propane

Answer: A::B::D

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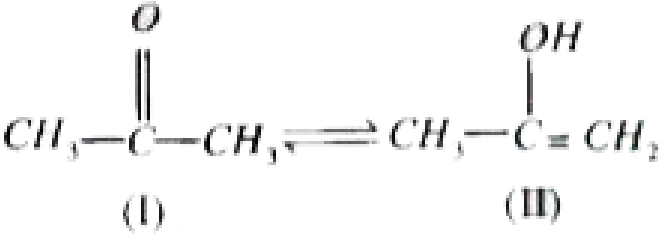
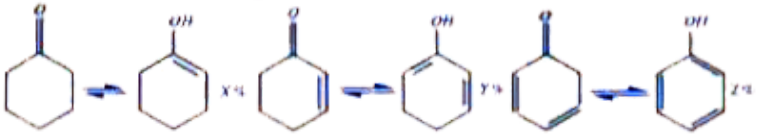
LECTURE SHEET (EXERCISE-I (LINKED COMPREHENSION TYPE QUESTIONS))

1. Tautomerism is the phenomenon in which two structural isomers differing in the relative position of their atoms are spontaneously interconvertible and can exist in dynamicequilibrium.



(I) (II)

Tautomers I and II are structural isomers that are related only by the shift of a hydrogen atom an one or more Pi bond.



The relation between the enol contents X, Y, Z should be

A. X gt Y gt Z

B. Z gt Y gt X

C. Y gt X gt Z

D. Y gt Z gt

Answer: B

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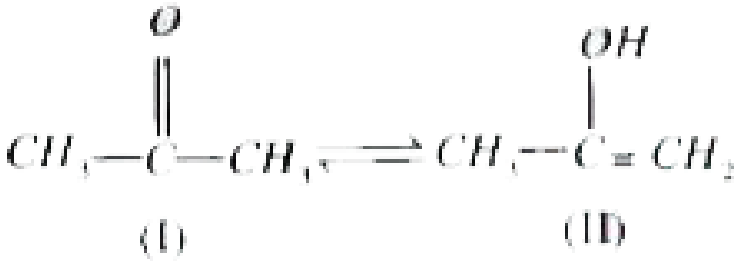
2. Tautomerism is the phenomenon in which two structural isomers differing in the relative position of their atoms are spontaneously interconvertible and can exist in dynamicequilibrium.



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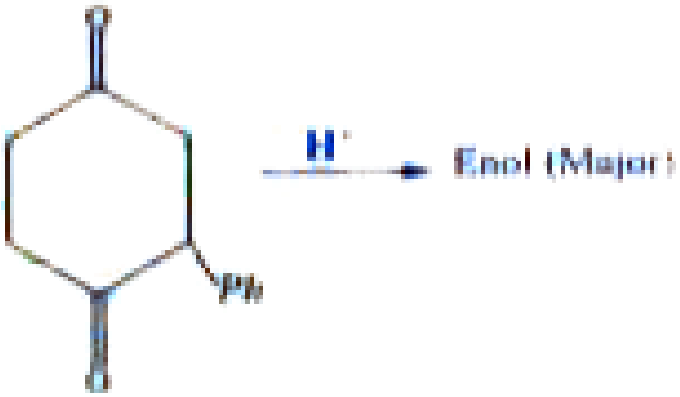
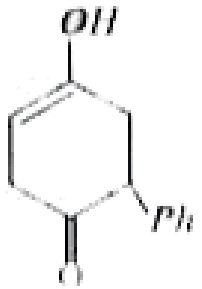
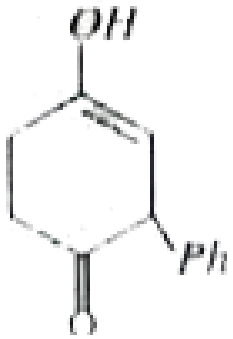


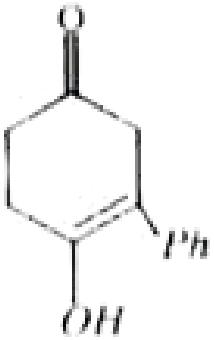


A.

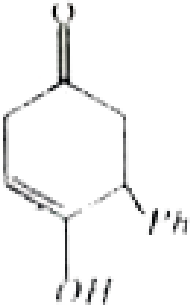


B.

C.



D.



Answer: C

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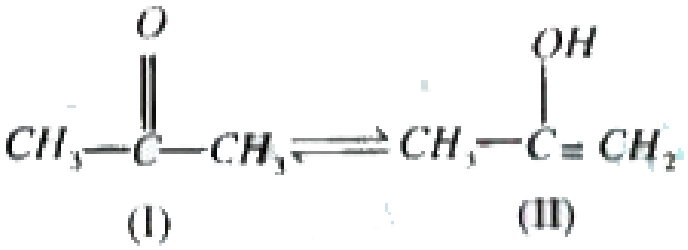
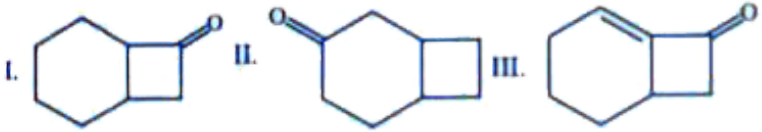
3. Tautomerism is the phenomenon in which two structural isomers differing in the relative position of their atoms are spontaneously interconvertible and can exist in dynamicequilibrium.



(I) (II)

Tautomers I and II are structural isomers that are related only by the shift of a hydrogen atom an one or more Pi bond.



Among these compounds, the order of enol contents should be

A. I gt II gt III

B. III gt II gt I

C. III gt I gt II

D. II gt III gt I

Answer: C

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LECTURE SHEET (EXERCISE-I (INTEGER TYPE QUESTIONS))

1. Number of six membered cyclic conjugated dienes possible for C_6H_8 is

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2. The minimum number of carbon atoms to be present in an alkyne to exhibit chain isomerism is

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3. Number of positional isomers possible for methyloctane

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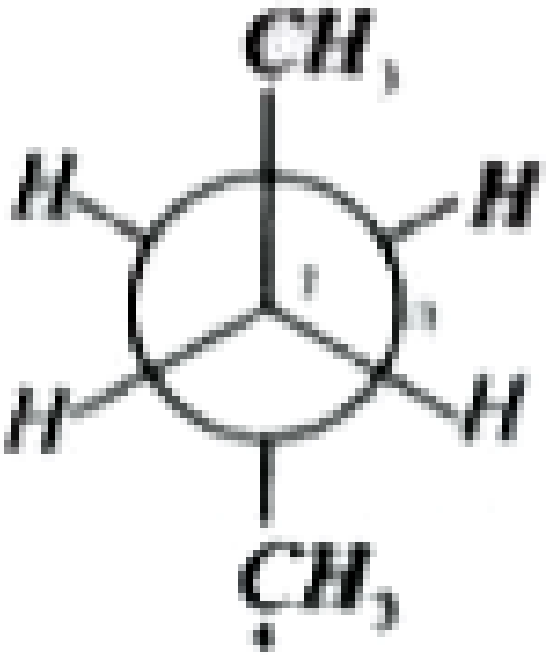
LECTURE SHEET (EXERCISE-II (STRAIGHT OBJECTIVE TYPE QUESTIONS))

1. In the given conformation C_2 is rotated about $C_2 - C_3$ bond by 120°, then the conformation formed will be



A. fully eclipsed

B. partially eclipsed

C. gauche

D. staggered

Answer: C

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2. The number of conformational isomers possible of n-butane about $C_2 - C_3$ bond

A. One

B. Four

C. Three

D. Infinite

Answer: D

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3. Which of the following is correct regarding stability of conformations of n-butane about $C_2 - C$ bond

Anti (I) gauche (II) partially eclipsed (III) fülly eclipsed (IV)

A. I gt II gt III gt IV

B. I gt II gt IV gt III

C. IV gt III gt II gt I

D. IV gt II gt I gt III

Answer: A

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4. Which of the following is the most stable conformer of 1, 2, 4 -trimethyl cyclohexane

A. 

B. 

C. 

D. 

Answer: A

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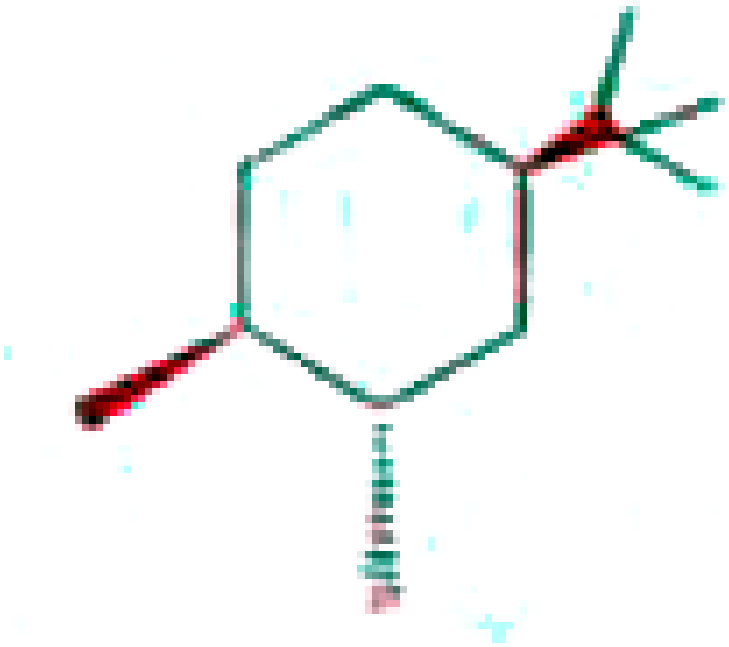
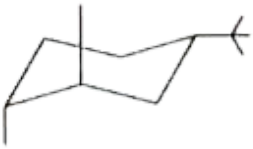
5. Choose the stable form of the compound given below in chair conformation



A. 

B. 

C. 

D. 

Answer: B

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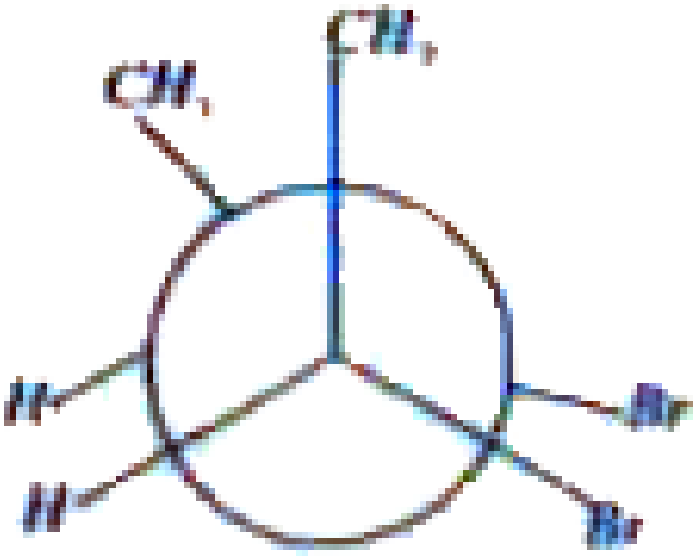
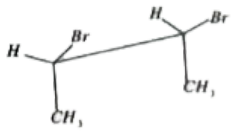
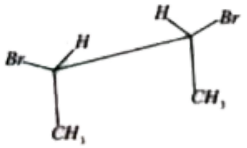
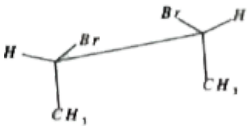
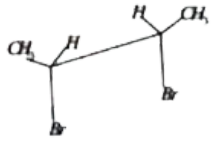


6. Translating this eclipsed Newman projection formula of 2, 3 dibromobutane into eclipsed sawhorse projection appears as

A. 

B. 

C. 

D. 

Answer: A

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7. Geometrical isomerism is possible about which of the following multiple bonds?

A. $C = N$

B. $N = N$

C. $C = C$

D. all of these

Answer: D

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8. Which of the following possess highest melting point

A. cis-2-butene

B. trans-2-butene

C. Isobutene

D. 1-butene

Answer: B

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9. Number of possible geometrical isomers for 2, 4 - hexadjenie is

A. 8

B. 4

C. 3

D. 2

Answer: B

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10. Which of the following statements is right regarding geometrical isomers

A. All cis-isomers must be Z-isomers

B. All trans-isomers must be E-isomers

C. A cis-isomer can be either Z or E

D. None of the above is correct

Answer: C

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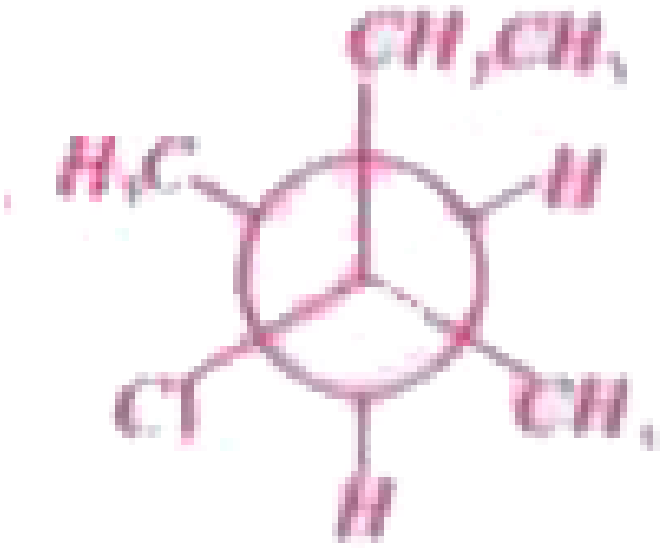
11. The IUPAC name of the compound given is



A. 2-chloro-4-methylphentane

B. 3-chloro-3-methylpentane

C. 3-chloro-4-methylpentane

D. 2-chloro-3-methylpentane

Answer: B

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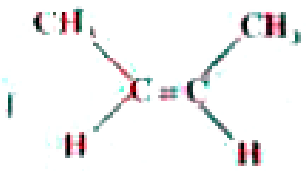
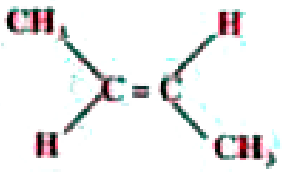
12.

I 

cis-2-butene

II 

trans-2-butene

Which of the following order of stability is correct among these two isomers ?

A. I = II

B. I gt II

C. II gt I

D. cannot be predicted

Answer: C

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13. Which of the following does not show geometrical isomerism?

A. 1, 2 - dichloro - 1 - pentene

B. 1,3 - dichloro - 2- pentene

C. 1, 1 - dichloro - 1 - pentene

D. 1,4 - dichloro - 2 - pentene

Answer: C

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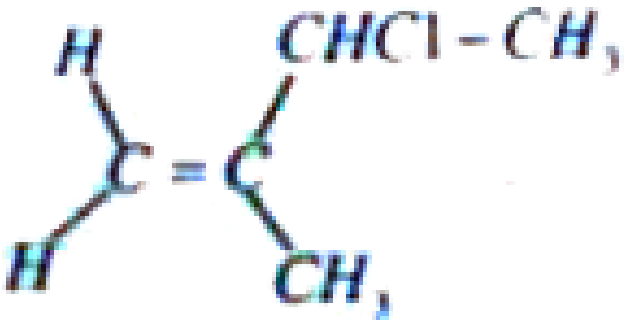
14. The name of the molecule shown is



A. cis-3-chloro-2-methyl-2-butene

B. 3-choro-2-methylene-butane

C. 2-chloro-3methylene-butane

D. 3-chloro-2-methyl-1-butene

Answer: D

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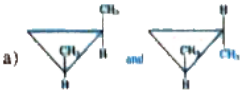
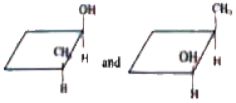
15. Identify the pair of isomers which are geometrical isomers of each.

A. 

B. 

C. $CH_2 = CH = CH_2 \& CH_3 - CH = CH_2$

D. $CH_3 - CH = CH - CH_3 \& CH_2 = CH - CH_2CH_3$

Answer: A

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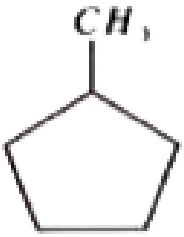
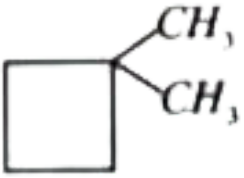
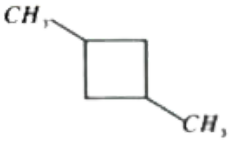
16. Which of the following cycloalkanes will show cis-trans isomerisin?

A. 

B. 

C. 

D. All the above

Answer: C

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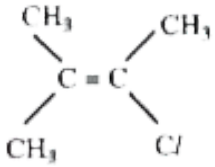
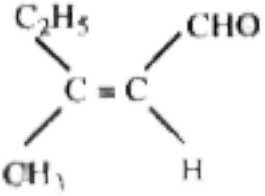
17. Which of the following compounds is Z-isomer

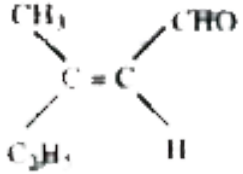
A.



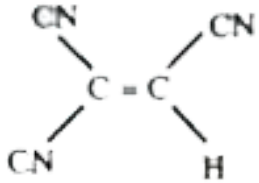
B.



C.



D.



Answer: B

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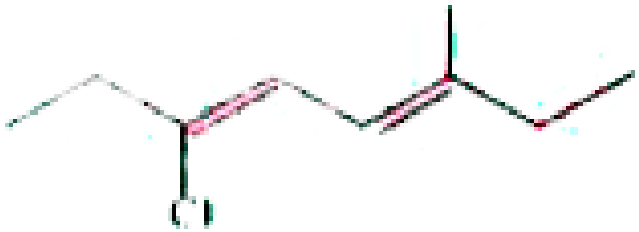
18. 

This compound is named in IUPAC as

A. 3-chloro-6-methyl-(3E,5Z)-octadiene

B. 3-chloro-6-methyl-(3Z,5E)-octadiene

C. 3-chloro-6-methyl-(3Z,5Z)-octadiene

D. 3-chloro-6-methyl-(3E,5E)-octadiene

Answer: B

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19. $CH_2 = CH - CH = CH - CH = CH - CH_3$ How many geometrical isomers of this compound are possible?

A. 2

B. 3

C. 4

D. 8

Answer: C

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20. How many geometrical isomers of this compound are possible?

A. 0

B. 2

C. 3

D. 4

Answer: A

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21. Which of the cycloalkenes is likely of exhibit geometrical isomerism?

A. I

B. II

C. III

D. all of these

Answer: C

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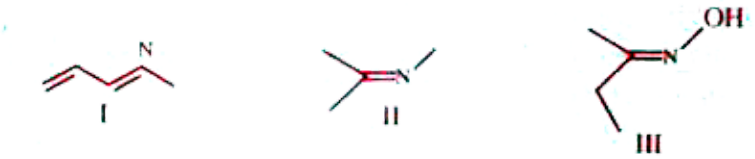
22. Which of these compounds are likely to exhibit geometrical isomerism



A. I

B. II

C. III

D. I and III

Answer: D

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LECTURE SHEET (EXERCISE-II (MORE THAN ONE CORRECT TYPE QUESTIONS))

1. Which of the following possess zero dipole moment

A. trans-2,3-dichloro-2-butene

B. cis-2,3-dichloro-2-butene

C. trans-3-hexene

D. cís-2-pentene

Answer: A::C

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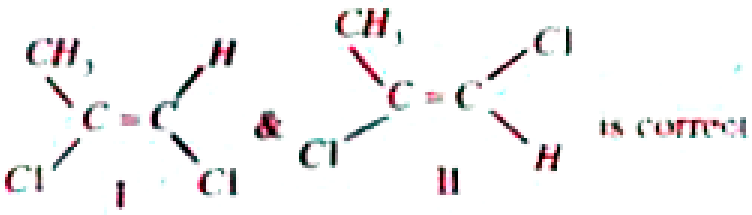
2. Which of the following statements regarding



is correct

A. I & I are geometrical isomers

B. Both I & II possess dipole moment

C. I is Z isomer

D. II is trans isomer

Answer: A::B::C::D

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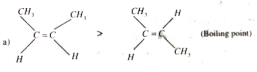
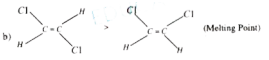
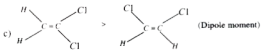
3. Which of the following is correct

A. 

B. 

C. 

D. $CH_3C \equiv \mathrm{CCH}_3 > CH_3CH_2C \equiv CH$ (dipole moment)

Answer: A::B::C

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LECTURE SHEET (EXERCISE-II (LINKED COMPREHENSION TYPE QUESTIONS))

1. Stereoisomers, which can be interconverted simply by rotation about sigma bonds, are conformational isomers while those, which can be converted only by breaking and remaking of bonds and not simply by rotation, are called configurational isomers.

The angle between C-C and C – H bonds on adjacent carbon atoms in any conformation is called dihedral angle.

The cyclic compounds most commonly found in nature containing six membered rings can exist in a conformation that is almost completely free of strain. The most stable conformation of cyclohexane is chair form.

According to Bayer strain theory, the greater deviation from the normal tetrahedral angle, greater is the angle strain or torsional strain and

hence lesser is the stability of the cycloalkane.

Dihedral angle in staggered (gauche) and eclipsed conformation are:

A. 60° and 0°

B. 0° and 60°

C. $60^\circ, 120^\circ$

D. $120^\circ, 60^\circ$

Answer: A

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2. Stereoisomers, which can be interconverted simply by rotation about sigma bonds, are conformational isomers while those, which can be converted only by breaking and remaking of bonds and not simply by rotation, are called configurational isomers.

The angle between C-C and C – H bonds on adjacent carbon atoms in any conformation is called dihedral angle.

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Dihedral angle between two methyl groups of n-butane in the gauche and anti forms are :

A. $60^\circ, 0^\circ$

B. $60^\circ, 180^\circ$

C. $0^\circ, 160^\circ$

D. $180^\circ, 60^\circ$

Answer: B

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3. Stereoisomers, which can be interconverted simply by rotation about sigma bonds, are conformational isomers while those, which can be

converted only by breaking and remaking of bonds and not simply by rotation, are called configurational isomers.

The angle between C-C and C – H bonds on adjacent carbon atoms in any conformation is called dihedral angle.

The cyclic compounds most commonly found in nature containing six membered rings can exist in a conformation that is almost completely free of strain. The most stable conformation of cyclohexane is chair form.

According to Bayer strain theory, the greater deviation from the normal tetrahedral angle, greater is the angle strain or torsional strain and hence lesser is the stability of the cycloalkane.

Which among the following conformation of cyclohexane is the most stable form ?

A. Chair form

B. Half chair forms

C. Twist boat form

D. Boat form

Answer: A

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LECTURE SHEET (EXERCISE-II (INTEGER TYPE QUESTIONS))

1. $CH_3 - CH = \underset{C}{\overset{|}{C}} - \underset{C}{\overset{|}{C}} = CH - CH_3$ Number of geometrical isomers possible for this compound are

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2. How many of the following statements are correct?

1) The most stable conformer of cis-1, 3-cyclohexanediol is chair form.

2) Cis- 1, 3- cyclohexanediol is more stable than trans -1, 3-cyclohexanediol.

3) In Cis 1, 3-cyclohexanediol both the OH groups occupy equitorial positions.

4) The most stable conformer of trans -1, 4-cyclohexanediol is chair form.

5) The most stable conformer of cis-1, 4-cyclohexanediol is boat conformer.

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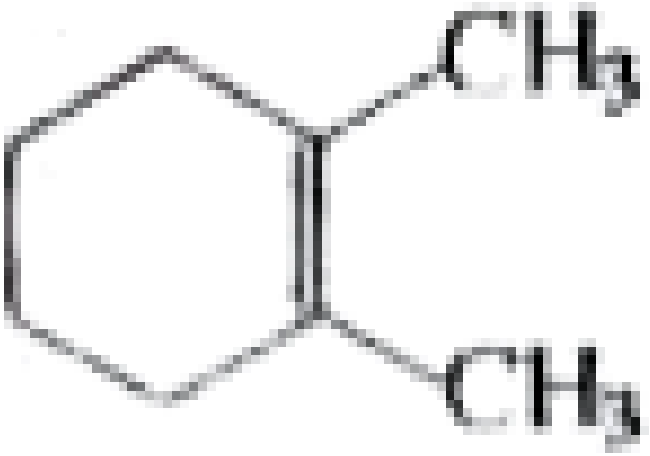

3.

The possible number of geometrical isomers for this compound which can be isolated at room temperature is

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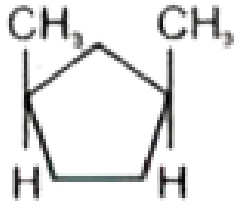
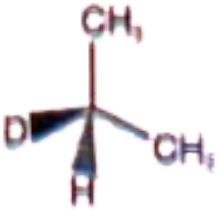
LECTURE SHEET (EXERCISE-III (STRAIGHT OBJECTIVE TYP QUESTIONS))

1. Which species does not exhibit a plane of symmertry ?

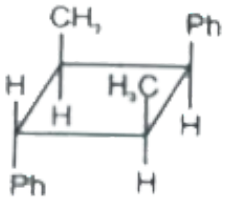
A.



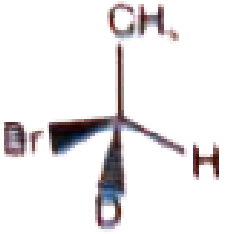
B.



C.



D.



Answer: D

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2. (A): $CH_3CH(OH)COOH$ is optically active

(R) : $CH_3CH(OH)COOH$ do not possess any element of symmetry.

The correct answer is

A. Both A and R are true and R explains A

B. Both A and R are true and R does not explains A

C. A is true, R is false

D. A is false, R is true

Answer: A

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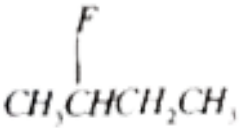
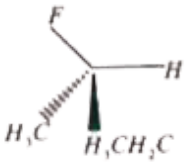
3. The structure of (S)-2-fluorobutane is best represented by :

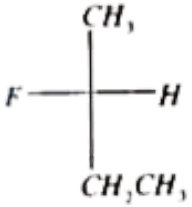


A.

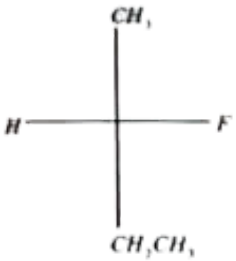
B.



C.



D.



Answer: C

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4. The horizontal bonds in Fischer projection respresents the bond in the three dimension for

A. Both below the plane of paper

B. Both above the plane of paper

C. Both on the plane of paper

D. One above and another below the plane of paper

Answer: B

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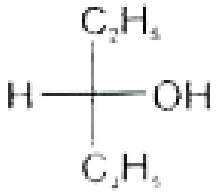
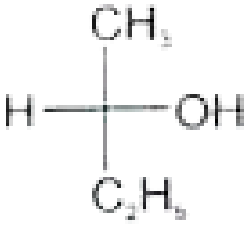
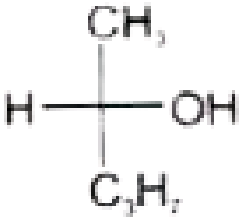
5. Which of the following is the structure of (S)-Pentan-2-ol is ?

A.

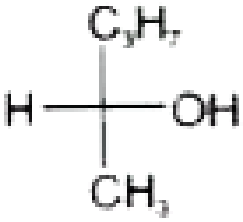


B.





C.



D.

Answer: C

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6. Optically active among the following is

A. Meso tartaric acid

B. dl - tartaric acid

C. Meso - 2, 3- butanediol

D. Erythro - 2, 3 - dihydroxy butanoic acid

Answer: D

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7. Which statement is true of 1,3-dimethylcyclobutane?

A. Only one form of the compound is possible

B. Two diastereomeric forms are possible

C. Two sets of enantiomers are possible

D. Two enantiomeric forms and one meso compound are possible

Answer: B

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8. Number of stereoisomers possible for $BrCH_2CHClCH_2CHClCH_3Br$

A. two

B. three

C. four

D. six

Answer: B

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9. Which of the following molecules is achiral?

A. (2R, 3R) - 2,3-Dichloropentane

B. (2R, 3S) - 2,3-Dichloropentane

C. (2S, 4S) - 2,4-Dichloropentane

D. (2S, 4R) - 2,4-Dichloropentane

Answer: D

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10. Which is, a meso compound?

A. (2R, 3R) - 2,3-Dibromobutane

B. (2R,3S)-2,3-Dibromopentane

C. (2R, 4R)- 2,4-Dibromopentane

D. (2R, 4S) -2,4-Dibromopentane

Answer: D

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11. What is the percent composition of a mixture of $(S)-(+)-2-$ butanol, $[\pm]\frac{25}{D}=+13.52^0$, and $(R)-(-)-2-$ butanol, $[\pm]\frac{25}{D}=-13.52^0$, with a specific rotation $[\pm]\frac{25}{D}=+6.76^0$?

A. 75%(R) 25%(S)

B. 25%(R) 75%(S)

C. 50%(R) 50%(S)

D. 67%(R) 33%(S)

Answer: A

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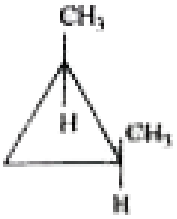
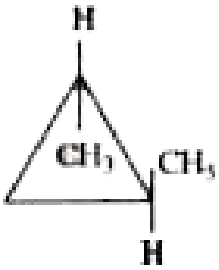
12. Which of the following molecule is optically active

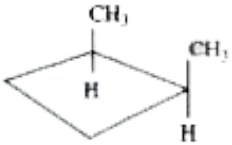
A.



B.



C.



D. 

Answer: B

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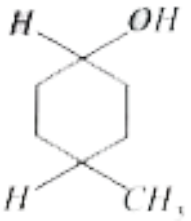
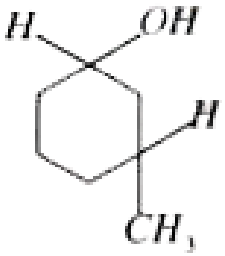
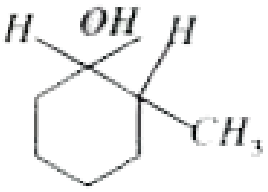
13. Which of the following niolecule does not contain chiral centre (s)

A. 

B. 

C. 

D. all the above

Answer: A

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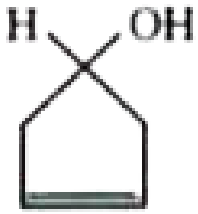
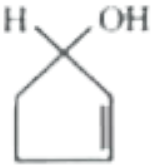
14. Which of the following is a chiral molecule

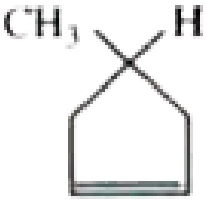
A.



B.



C.



D. all the above

Answer: B

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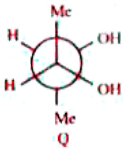
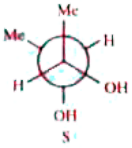
15. Among the following, the Newmann projection formula of meso-2, 3-butanediol are / is

(I) 

(II) 

(III) 

(IV) 

A. I, II

B. I, III

C. II, IV , III

D. IV, II, IV

Answer: B

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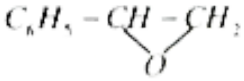
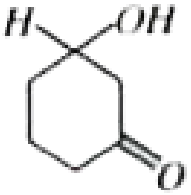
16. Which one of the compound is achiral :

A. 

B. $CH_3 - CH_2 - CHOHCN$

C. 

D. 

Answer: D

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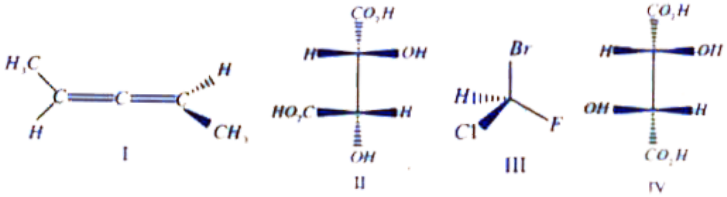
LECTURE SHEET (EXERCISE-III (MORE THAN ONE CORRECT ANSWER TYPE QUESTIONS))

1. Which of the following is chiral ?



A. a. I

B. b. II

C. c. III

D. d. IV

Answer: A::C::D

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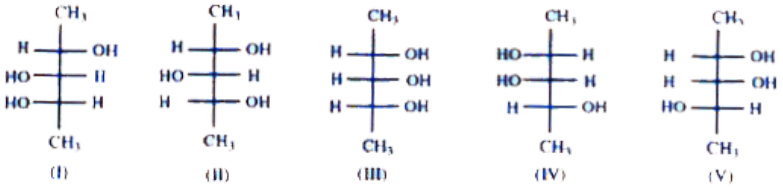
2. Which structure(s) represent(s) diastereomer(s) of I?



A. a. II and III

B. b. III and IV

C. c. II and IV

D. d. III and V

Answer: A::B

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3. Which of the following statement is right

A. All molecules containing two or more chiral C-atoms must be optically active

B. All molecules having one chiral C-atom is optically active

C. Molecules without chiral carbon atoms can be optically active

D. All molecules having two equal chiral C-atoms have three stereoisomers

Answer: B::C::D

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LECTURE SHEET (EXERCISE-III (LINKED COMPREHENSION TYPE QUESTIONS))

1. Compounds having the same molecular formula, same structure with different configuration are called stereoisomers and the phenomenon is called stereoisomerism. The phenomenon is broadly classified with three types called (a) geometrical isomerism (b) optical isomerism and (c) conformational isomerism.

Which of the following compounds exhibit both geometrical as well as optical isomerism

A. $CH_2 = CH - \underset{\underset{OH}{|}}{CH}\,C\,H - CH_3$

B. $CH_3 - CH = CH - \underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}} - CH_3$

C. $CH_3 - CH = CH - \underset{\underset{CH_3}{|}}{C}\,H - CH_2CH_3$

D. $(CH_3)_2C = CH - \underset{CH_3}{\overset{|}{C}}H - CH_2CH_3$

Answer: C

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2. Compounds having the same molecular formula, same structure with different configuration are called stereoisomers and the phenomenon is called stereoisomerism. The phenomenon is broadly classified with three types called (a) geometrical isomerism (b) optical isomerism and (c) conformational isomerism.

Which of the following compounds possess diastereisomerism

$\underset{I}{CH_3CH = CHCH_3}$ $\underset{II}{CH_3 - CH_2 - CH = CH_2}$ $\underset{III}{CH_3 - \underset{CH_3}{\overset{|}{C}} =}$

A. I, II

B. I,III

C. II,III

D. I only

Answer: D

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3. Compounds having the same molecular formula, same structure with different configuration are called stereoisomers and the phenomenon is called stereoisomerism. The phenomenon is broadly classified with three types called (a) geometrical isomerism (b) optical isomerism and (c) conformational isomerism.

Which of the following compounds possess only three stereoisomers

A. a. 2, 3-dichloropentane

B. b. 2, 3-dichlorobutane

C. c. 2, 3, 4-trichloropentane

D. d. all the above

Answer: B

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LECTURE SHEET (EXERCISE-III (INTEGER TYPE QUESTIONS))

1. $CH_3 - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - CH_2 - CH_3$ number of optical isomers possible for this compound is

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2. Number of chiral C-atoms present in 1,3-dimethyl cyclobutane

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3. W, X & Y are number of stereoisomers for the following compounds

A) 1,2-dichloro cyclopropane= W

B) 1, 3-dimethyl cyclobutane = X

C) 2- bromo 3-chloro butane = Y

Hance $W + X + Y =$ _____

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PRACTICE SHEET (EXERCISE-I (LEVEL-I) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. A Satellite is in an elliptic orbit around the earth with aphelion of 6R and perihelion of 2R

A. Position isomerism

B. Chain isomerism

C. Tautomerism

D. Geometrical isomerism

Answer: A

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2. Which pair of isomers given below are positional isomers

A. Propanal and propanone

B. 1° Butyl alcohol and Isobutyl alcohol

C. 3° butyl alcohol and Isobutyl alcohol

D. 2° Butyl alcohol and 3° Butyl alcohol

Answer: C

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3.

Relation between the above compounds:

A. Position isomers

B. Chain isomers

C. Homologs

D. No relation

Answer: B

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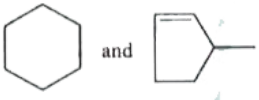
4. Which of the following pairs represents isomers of each other

A. 

B. $CH_3OCH_3 \& CH_3COCH_3$

C. 

D. $CH_3CH_2OH \& C_2H_5OC_2H_5$

Answer: A

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5. Which of the following exhibits chain isomerism?

A. $CH_3CH_2NH_2$

B. $CH \equiv C - CH_2CH_3$

C. $CH_2CH_2CH_2OH$

D. $CH \equiv C - CH_2CH_2CH_3$

Answer: D

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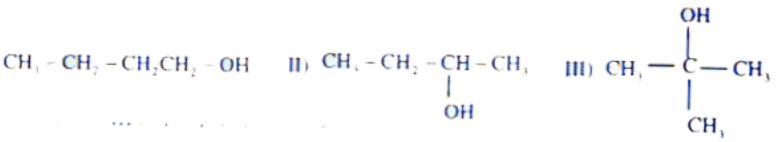

6.

Among these , III is the chain isomer of

A. I only

B. II only

C. both I and II

D. none of these

Answer: C

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7. The compounds $C_2H_5OC_2H_5$ and $CH_3OCH_2CH_2CH_3$ are

A. chain isomers

B. geometrical isomers

C. metamers

D. conformational isomers

Answer: C

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8. Find the number of aldehydes and ketones (including with stereo isomers) of Molecular formula $C_5H_{10}O$ Can have:

A. 6-Aldehyde, 4-Ketone

B. 5-Aldehyde, 3-Ketone

C. 4-Aldehyde, 3-Ketone

D. 5-Aldehyde, 2-Ketone

Answer: B

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9. The number of primary, secondary and tertiary amines possible with the molecular formula C_3H_9N respectively.

A. 1,2,2

B. 1, 2,1

C. 2, 1, 1

D. 3,0, 1

Answer: C

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10. How many structural isomers are possible in structure c_7H_9N Containing benzene ring:

A. 5

B. 4

C. 6

D. 20

Answer: A

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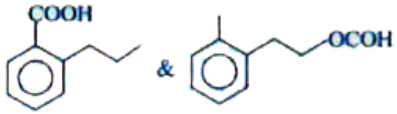
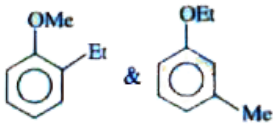
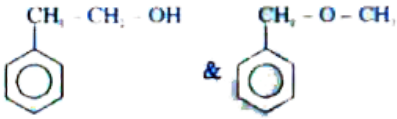
11. Which of the following options are correctly matched?



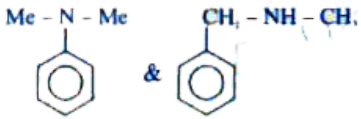
functional isomer



metamers



metamers



functional isomers

A. TFTF

B. FTTF

C. TTFT

D. TFFT

Answer: C

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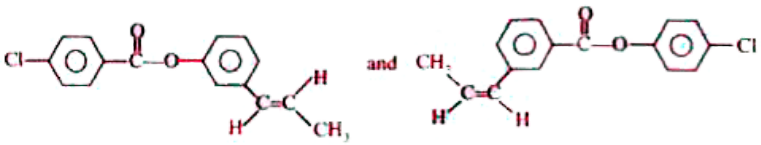
12. 

Shows which type of isomerism

A. Functional group isomerism

B. Geometrical isomerism

C. Metamerism

D. Position isomerism

Answer: C

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13. C_4H_8 can have a total of __isomers (include cyclic isomers not geometrical)

A. a. 3

B. b. 4

C. c. 5

D. d. 6

Answer: C

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14. The no. of amides having formula C_3H_7NO each of which is capable of forming hydrogen bonding are :

A. 1

B. 2

C. 3

D. 4

Answer: C

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15. How many carboxylic acid structures (structural isomers) can be written from the molecular formula $C_6H_{12}O_2$.

A. 4

B. 6

C. 8

D. 10

Answer: C

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16. $C_4H_4O_4$ can be

A. a. A cyclic ester of dibasic acid

B. b. A cis-dibasic acid

C. c. A trans-dibasic acid

D. d. All true

Answer: D

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17. In which of the following pairs of compounds are the two members of the pair constitutional isomers?

A. methoxymethane and ethoxyethane

B. pentanol and pentanediol

C. propyl alcohol and di-n-propyl ether

D. isobuty alcohol and diethyl ether

Answer: D

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18. Number of structural isomers with the formula $C_4H_{11}N$

A. 2

B. 8

C. 6

D. 5

Answer: B

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19. Which of the following is a pair of functional isomers?

A. $CH_3COCH_3.\ CH_3CHO$

B. $C_2H_5CO_2H, CH_3CO_2CH_3$

C. $C_2H_5CO_2H, CH_3CO_2C_3H_5$

D. CH_5CO_2H, CH_3CHO

Answer: B

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20. Constitutional isomers is possible between memebers of which of the following types of compounds?

A. amines and amides

B. amides and carboxylic acids

C. primary amines and secondary amines

D. amines and aldehydes

Answer: C

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PRACTICE SHEET (EXERCISE-I (LEVEL-II) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. Which of the following molecules is likely to possess functional isomerism

A. CH_3OH

B. CH_3COCH_3

C. CH_3NH_2

D. $HCOOH$

Answer: B

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2. RCN and RNC are..... isomers :

A. functional

B. tautomers

C. chain

D. position

Answer: A

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3. A pair of functional isomers

A. $CH_3CH_2CH_2OH, CH_3CH(OH)CH_3$

B. $CH_3CH_2CH_2OH, (CH_3)_2CHCH_2OH$

C. $CH_3CH_2CH_2OH, CH_3CH_2CH_2Cl$

D. $CH_3CH_2CH_2OH, CH_3 - O - CH_2CH_3$

Answer: D

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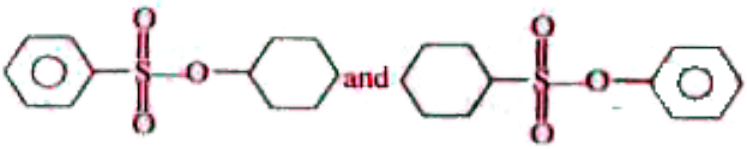
4. Given compound shows which type of isomerism



A. Chain isomerism

B. Positional isomerism

C. Metamerism

D. Functional group isomerism

Answer: C

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5. Ortho, meta and para dichlorobenzenes are

A. Chain isomers

B. Positional isomers

C. Functional isomers

D. Stereoisomers

Answer: B

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6. Number of isomers for the compound dihydroxy benzene

A. 1

B. 2

C. 3

D. 4

Answer: C

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7. An organic compound of structure $CH_3 - CH_2 - CH_2 - CO - CH_3$ shows functional isomerism with another organic compound of structural formula_____

A. $CH_3 - CH_2 - CO - CH_2 - CH_3$

B. $CH_3 - CH_2 - CH_2 - CH_2CHO$

C. $CH_3 - CH = CH - CH_2 - CH_2OH$

D. b and c

Answer: D

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8. The number of benzene isomers for C_8H_{10} ?

A. 1

B. 2

C. 3

D. 4

Answer: D

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9. Compounds with $C_4H_{11}N$ as molecular formula can exhibit

A. Position isomerism

B. Metamerism

C. Functional isomerism

D. All the three

Answer: D

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10. The no. of amides having formula C_4H_9NO are :

A. 5

B. 6

C. 7

D. 8

Answer: D

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11. Which of the following statements is right

A. All caboxylic acids exhibits functional isomers as esters

B. All alkynes exhibit chain isomerism

C. All ketones exhibit functional isomers as aldehydes

D. All ketones exhibit chain isomerism

Answer: C

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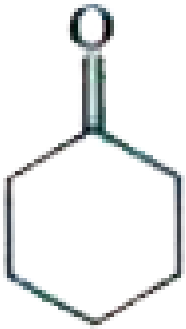
12. Tautomer in following is Diad system :

A. CH_3COCH_3

B. $CH_3CH_2NO_2$



C.

D. HCN

Answer: D

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13. What statement is correct for Keto-enol tautomerism ?

A. Tautomersim is catalysed by acid and base.

B. Tautomers are present in dynamic equilibrium state.

C. Generally keto form is more stable than enol form

D. all

Answer: D

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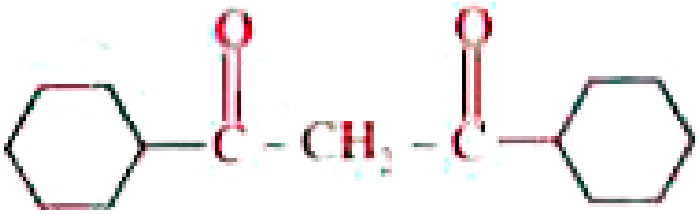
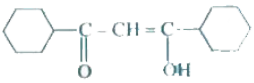
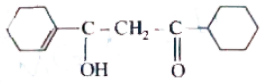
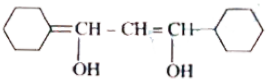
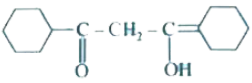
14. Tautomer of following compound is :



A. 

B. 

C. 

D. 

Answer: A

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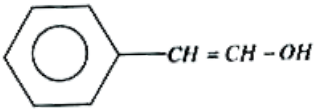
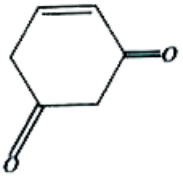
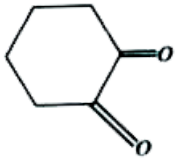
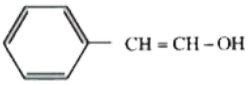
15. Tautomerism is exhibited by X number of compounds among the following. What is X.

a) 

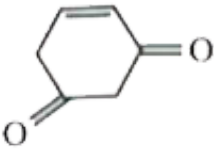
b) 

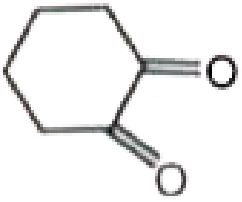
c) 

d) 

A. 

B. 

C. 

D. 

Answer: B

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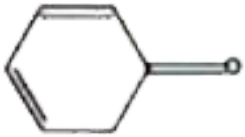
16. Maximum enolisation takes place in :

A. CH_3COCH_3

B. CH_3COCH_2CHO

C. $CH_3COCH_2COCH_3$

D. 

Answer: D

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17. Tautomerism exhibited by

A. $(CH_3)_3CNO$

B. $(CH_3)_2NH$

C. R_3CNO_2

D. $R - CH_2 - NO_2$

Answer: D

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18. Tautomers possess

A. same physical properties but different chemical properties

B. same chemical properties but different physical properties

C. different physical and chemical properties

D. same physical and chemical properties

Answer: C

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19. Which of the following is/are incorrect about keto-enol tautomerism?

A. Acid catalysed enolisation involve the intermediate carbanion

B. Racemisation occurs on keeping aqueous solution of carbonyl compounds in which a-carbon is a symmetric containing one enolisable proton

C. Enol form is less stable than keto form in cyclopent-1,2-dione

D. Keto form is more stable than enol in butan-1,2-dione

Answer: C

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20. Which of the fillowing pairs cannot exist in between two structural isomers

A. Functional and position

B. Ring-chain and functional

C. Metamerism and functional

D. Chain and functional

Answer: A

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21. The percentage of enol content in the following is in the order

I) $CH_3COCH_2COCH_3$ II) $CH_3COCH_2COOCH_3$ III) $CH_3COCH_2CH_2CH_5$

A. $I > II > III$

B. $I > III > II$

C. $III > II > I$

D. $II > III > I$

Answer: A

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22.

(I) isomerizes to (II) on addition on small amount of base structure of (II)

is

A. $CH_3 - \overset{OH}{\overset{|}{C}}H - \overset{OH}{\overset{|}{C}}H - Ph$

B. $H - \overset{O}{\overset{||}{C}} - CH_2 - \overset{OH}{\overset{|}{C}}H - Ph$

C. $CH_3 - \underset{OH}{\overset{|}{C}}H - \underset{O}{\overset{||}{C}} - Ph$

D. $CH_3 - \underset{O}{\overset{|}{C}} - \underset{O}{\overset{||}{C}} - Ph$

Answer: C

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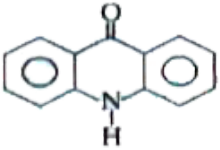
23. Which of the following can tautomerise.

A. $CD_3 - \underset{\underset{O}{||}}{C} - Ph$

B. 

C. 

D.

Answer: D

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24. Decreasing order of enol content of the following compound in liquid phase

I) $CH_3-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-O-Et$

II) $CH_3-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-CH_3$

III) $Ph-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-Ph$

IV) 

A. a. $1 > 2 > 3 > 4$

B. b. $3 > 2 > 1 > 4$

C. c. $3 > 2 > 4 > 1$

D. d. $2 > 3 > 1 > 4$

Answer: B

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25. Metamerism is exhibited by

A. $C_2H_5COOC_2H_5$

B. $C_2H_5 - O - C_2H_5$

C. CH_3COCH_3

D. CH_3COOH

Answer: A::B

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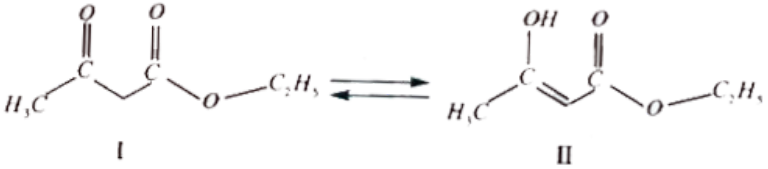
26. There exists the tautomeric forms



I II

Which are correct

A. % of form I increases in H_2O

B. % of form II decreases in H_2O

C. % of form II increases in ether

D. % of form I increases with temperature

Answer: A::B::C::D

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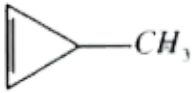
27. Chain isomer of cyclobutene is

A. $CH_3CH_2CH = CH_2$

B. $CH_3CH_2CH = CH - CH_3$

C. 

D. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH_2$

Answer: C

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28. Minimum number of carbon required to exhibit chain isomerism

A. 3

B. 4

C. 5

D. 6

Answer: B

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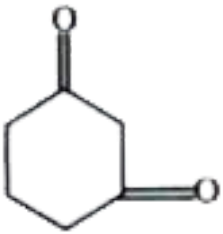
29. In which of the following cases enol content will be higher than the keto content in n-hexane?

A. $CH_3 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - CH_3$

B. 

C. 

D. $H_3C_2O - \overset{\overset{O}{||}}{C} - CH_2 - \overset{\overset{O}{||}}{C} - OC_2H_5$

Answer: B::C

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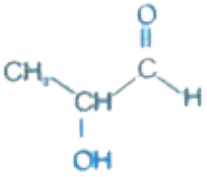
30. Which of the following are functional isomers of methyl ethanoate ?

A. $CH_3 - CH_2 - COOH$

B. 

C. $CH_3 - O - CH_2 - \overset{\overset{O}{\|}}{C} - H$

D. $\underset{\underset{OH}{|}}{C}H_2 - \overset{\overset{O}{\|}}{C} - CH_3$

Answer: A::B::C::D

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PRACTICE SHEET (EXERCISE-I (LEVEL-II) LINKED COMPREHENSION TYPE QUESTIONS)

1. Molecules having same molecular formula. But differing in structure (or) spatial orientation of atom is known isomers and phenomenon known as isomerism. Molecules which differ in structural formula are known as structural isomers and phenomenon is known as structural isomerism structural isomerism can be broadly classified as

(i) Chain isomerism (ii) Positional isomerism (iii) Functional isomerism

(iv) Metamerism (v) Tautomerism

Molecules having same molecular formula but differing in spatial orientation are known as stereo isomers and the phenomenon known as stereo isomerism. Stero isomerism can be classified as

(i) Geometrical isomerism (ii) Optical isomerism

Which of the following pair exhibit functional isomerism

A. ether and alcohol

B. ether and ketone

C. ketone and carboxylic acid

D. carboxylic acid and alcohol

Answer: A

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2. Molecules having same molecular formula. But differing in structure (or) spatial orientation of atom is known isomers and phenomenon known as isomerism. Molecules which differ in structural formula are known as structural isomers and phenomenon is known as structural isomerism structural isomerism can be broadly classified as

(i) Chain isomerism (ii) Positional isomerism (iii) Functional isomerism

(iv) Metamerism (v) Tautomerism

Molecules having same molecular formula but differing in spatial orientation are known as stereo isomers and the phenomenon known as stereo isomerism. Stero isomerism can be classified as

(i) Geometrical isomerism (ii) Optical isomerism

How many structural isomers possible for the given compound $C_4H_{10}O$

A. 5

B. 6

C. 7

D. 10

Answer: C

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3. Molecules having same molecular formula. But differing in structure (or) spatial orientation of atom is known isomers and phenomenon known as isomerism. Molecules which differ in structural formula are known as structural isomers and phenomenon is known as structural isomerism structural isomerism can be broadly classified as

(i) Chain isomerism (ii) Positional isomerism (iii) Functional isomerism

(iv) Metamerism (v) Tautomerism

Molecules having same molecular formula but differing in spatial orientation are known as stereo isomers and the phenomenon known as stereo isomerism. Stero isomerism can be classified as

(i) Geometrical isomerism (ii) Optical isomerism

The phenomenon in which molecules having same molecular formula and

same functional group but differing in the nature of alkyl group attached to functional group known as

A. Functional isomerism

B. Metamerism

C. Structural isomerism

D. Positional isomerism

Answer: B

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4. Tautomerism is due to spontaneous interconversion of two isomeric forms with differentfunctional groups into each other. The term tautomer means constitutional isomers thatundergo such rapid inter conversion that they cannot be independently isolated. In keto-enol tautomerism although Keto form in general is more stable, but some factors like H-bonding and extended double bonds conjugation may increase the stability of enol form

Enolic form of acetyl acelone is stabilized due to

(I) resonance as a result of conjugation

(II) intra molecular H-bonding (III) dipole- dipole repulsion

A. I and III

B. II and III

C. I and II

D. I only

Answer: C

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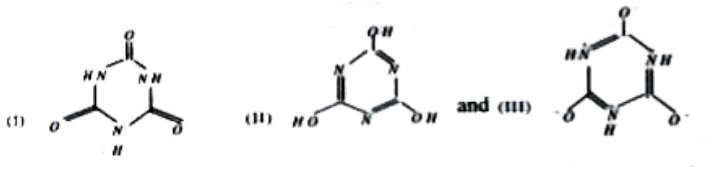
5. Tautomerism is due to spontaneous interconversion of two isomeric forms with differentfunctional groups into each other. The term tautomer means constitutional isomers thatundergo such rapid inter conversion that they cannot be independently isolated. In keto-enol tautomerism although Keto form in general is more stable, but some factors like H-bonding and extended double bonds conjugation may increase the

stability of enol form

Which of the following statements are correct of the following



A. I and II are tautomers

B. III is conjugate base of II

C. I and Ill are tautomers

D. III is resonance structure of I

Answer: A::D

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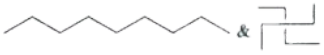
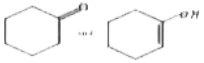
PRACTICE SHEET (EXERCISE-I (LEVEL-II) MATRIX MATCHING TYPE QUESTIONS)

1.

Column-I	Column-II
A) $CH_3CH_2COOCH_2CH_3$ and $CH_3COOCH_2CH_2CH_3$	P) functional group isomer
B) CH_3COOH and $HCOOCH_3$	Q) Metamer
C) 	R) Chain isomers
D) 	S) Tautomer

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2.

Column-I	Column-II
A) Esters and Carboxylic acid	p) Chain isomerism
B) n-Butanol and Iso butanol	Q) Tautomerism
C) Acetone and 2-propenol	R) Functional Isomerism
D) Maleic acid and fumeric acid	S) Geometrical Isomerism

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PRACTICE SHEET (EXERCISE-I (LEVEL-II) INTEGER TYPE QUESTIONS)

1. The number of structural isomers possible for C_7H_{16} is _____

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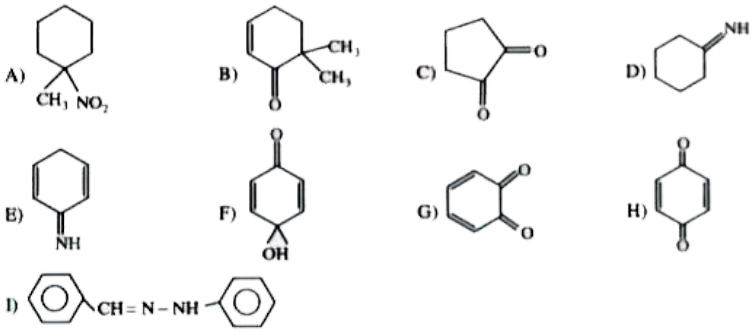
2. Among the following compounds how many can exhibit tautomerism?



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3. Total no. of isomeric alkadienes with the molecular formula C_5H_8

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PRACTICE SHEET (EXERCISE-II (LEVEL-I) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. The dihedral angle between the two methyl groups in gauche conformation of n-butane is

A. 120°

B. 60°

C. 180°

D. 0°

Answer: B

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2. The dihedral angle between the two methyl groups in anti conformation of n-butane is

A. 120°

B. 180°

C. 45°

D. 60°

Answer: B

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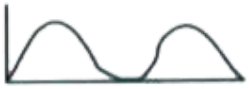
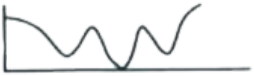
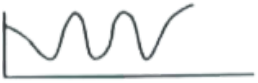
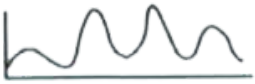
3. Which of the following is the energy profile diagram for n-butane about $C_2 - C_3$ bond correctly represented

A. 

B. 

C. 

D. 

Answer: B

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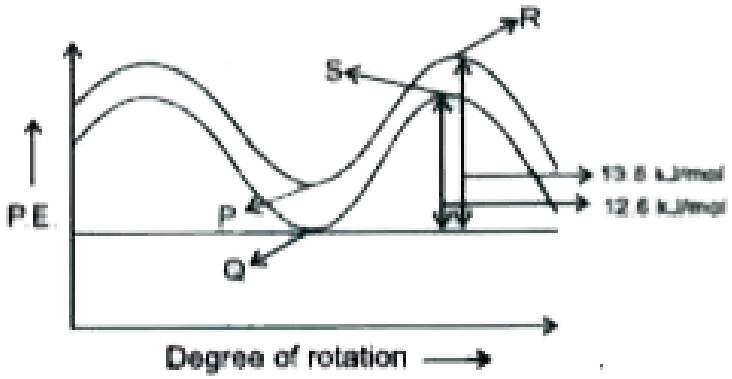
4. Which points on the potential energy diagram represent the eclipsed conformation of ethane and staggered conformation of propane

respectively ?



A. P,R

B. Q,R

C. S,P

D. R,Q

Answer: C

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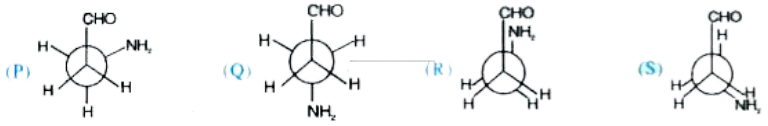
5. Consider the following conformations of 3-Aminopropanal, amongst the given conformations (P, Q, R, S) one of them is most stable.



The correct statements for the above is/are :

(I) H-bonding is present in the most stable conformer

(II) Gauche conformation is the most stable conformer

(III) Anti conformation is the most stable conformer

(IV) larger groups being separated by maximum distance in the conformer

A. II and IV

B. I and II

C. III and IV

D. I and IV

Answer: B

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6. The most stable conformation of ethylene glycol is

A. anti

B. gauche

C. Partially eclipsed

D. Fully eclipsed

Answer: B

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7. Flagpole interaction is present in

A. Chair form of cyclohexane

B. Antiform of n-butane

C. Boat form of cyclohexaned

D. Fully eclipsed form of nbutane

Answer: C

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8. Which of the following is associated with Torsional strain ?

A. Repulsion between bond pair of electrons

B. Inductive effect

C. Bond angle strain

D. Attraction of opposite charges

Answer: A

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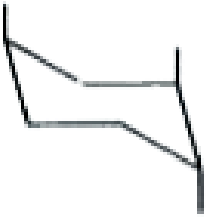
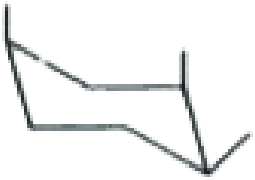
9. Among the structure shown below, which has lowest potential energy?

A.



B. 

C. 

D. 

Answer: D

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10. Increasing order of stability among the three main conformation (i.e. eclipse, anti, gauche) of ethylene glycol is :

A. Eclipse, gauche, anti

B. Gauche, eclipse, anti

C. Eclipse, anti, gauche

D. Anti, gauche, eclipse

Answer: C

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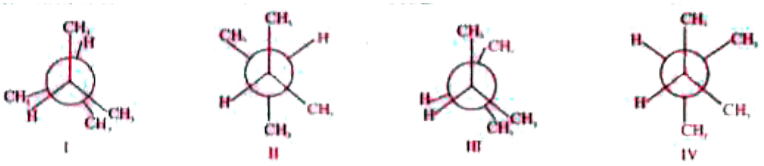
11. In which of the following has minimum torsional strain and minimum Vander waal strain.



A. I

B. II

C. III

D. IV

Answer: B

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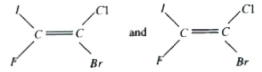
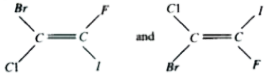
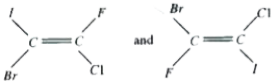
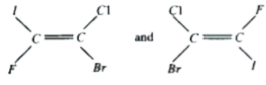
12. Which of the following pairs of compounds are geometrical isomers

A. 

B. 

C. 

D. 

Answer: D

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13. The cause of cis-trans isomerism is

A. strength of the double bond

B. stability of the double bond

C. vibration of the double bond

D. lack of rotation about the double bond

Answer: A

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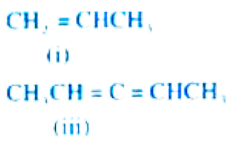
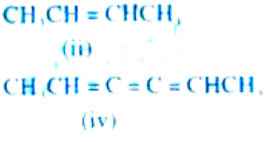
14. Which of the following compounds exhibits geometrical isomerism?



(i)

(iii)



(ii)

(iv)

A. $a.\ (ii), (iv)$

B. $b.\ (ii), (iii)\ \text{and}\ (iv)$

C. $c.\ (ii), (iii)$

D. $d.\ (i), (iii)$

Answer: A

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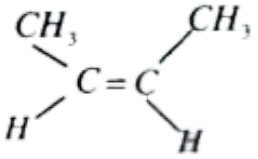
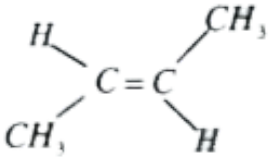
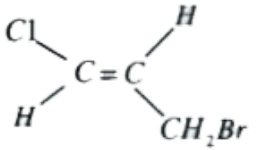
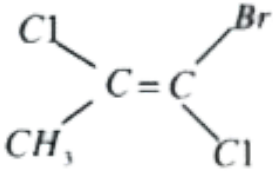
15. Which of the following is classified as Z and trans-isomer?

A. 

B. 

C. 

D. 

Answer: D

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16. Geometrical isomerism results because molecules has :

A. a centre of symmetry

B. a plane of symmetry

C. the capacity to rotate the plane of polarized light

D. two dissimilar groups attached to a double bonded carbon atom.

Answer: D

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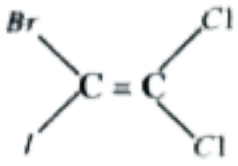
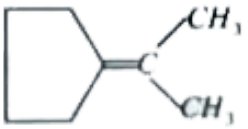
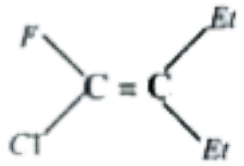
17. Which of the following does not show geometrical isomerism?

A. 

B. 

C. 

D. 

Answer: D

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18. https://media.cheggcdn.com/media%2F1d8%2F1d8cc659-3b9f-4ef8-be87-3f7a68fda4e8%2Fimage correct $IUPAC$ name for the molecule:

A. a. cis-3-chloro-3-pentene

B. b. E-3-chloro-2-pentene

C. c. tran-3-chloro-3-pentene

D. d. Z-3-chloro-2-pentene

Answer: D

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19. Which of the following compounds exhibits geometrical isomerism?

A. 2,3-dimethyl 1-2-butene

B. 2,3-dichloro-1-butene

C. 2,3-dichloro-2-butene

D. 1,1-dichloro-1-butene

Answer: C

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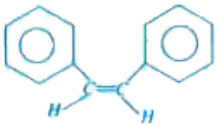

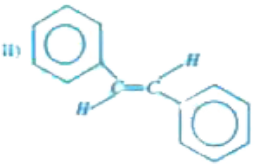

20.

Which of the following order of stability is correct among these two isomers ?

A. a. $I = II$

B. b. $I > II$

C. c. $II > I$

D. d. cannot be predicted

Answer: C

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PRACTICE SHEET (EXERCISE-II (LEVEL-II) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. Which of the following statements regarding

(I) cis-2-pentene & (II) trans-2-pentene is correct

A. I & II are a pair of diastereoisomers

B. I & II are a pair of geometrical isomers

C. I & II on hydrogenation give same product

D. all the above

Answer: D

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2. What characteristic property is common to both cis 2-butene, ans trans-2-butene?

A. Boiling point

B. Dipole moment

C. Heat of hydrogenation

D. Product of hydrogenation

Answer: D

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3. The IUPAC name of the compound

is

A. a. (2E, 4E, 6Z) -octa - 2, 4, 6-triene

B. b. (2Z, 4E, 6Z) -octa -2, 4, 6-triene

C. c. (2E, 4E, 6E)- octa- 2, 4, 6-triene

D. d. (2Z, 4Z, 6Z) -octa -2, 4, 6-triene

Answer: C

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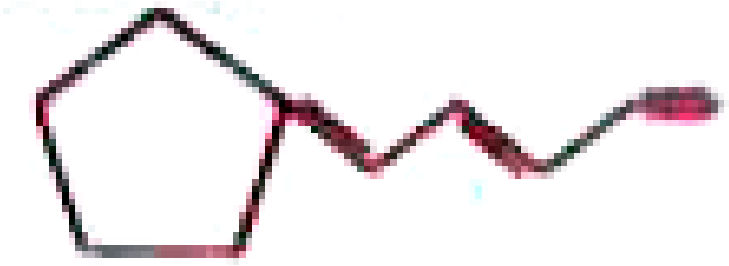
4. The number of cis-trans isomer possible for the following compound



A. 2

B. 4

C. 6

D. 8

Answer: A

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5. Which of the following have zero dipole moment?

A. benzene 1,4-diol

B. trans-1,2-dichloro ethene

C. cis-1,2-dichloro ethene

D. 1,1-dichloro ethene

Answer: B

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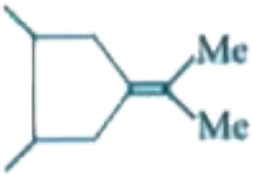
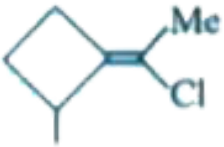
6. Which one of the following will not show geometrical isomerism ?

A. 

B. 

C. 

D. 

Answer: A

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7. Geometrical isomerism is possible in:

A. isobutene

B. acetone oxime

C. acetophenone oxime

D. benzophenone oxime

Answer: C

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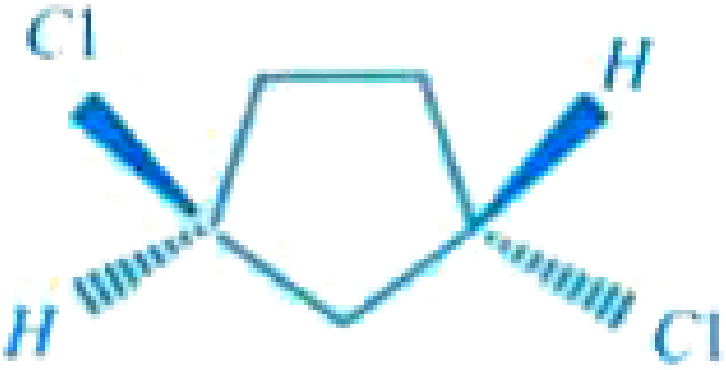
8. Select the systematic name for



A. a. cis-1,3-Dichlorocyclopentane

B. b. cis-1,2-Dichlorocyclopentane

C. c. trans-1,4-Dichlorocyclopentane

D. d. trans - 1,3-Dichlorocyclopentane

Answer: D

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9. Tautomer of which of the following can show geometrical isomerism

A. $CH_3 - CHO$

B. $CH_3CH_2 - CHO$

C. $(CH_3)_2CH - CH = O$

D. 

Answer: B

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10. Which of the following statements is not true regarding the cis and trans isomers of an alkene

A. They are configurational isomers

B. They are diastereomers

C. The cis-isomer has higher dipole moment than the trans-isomer

D. The cis isomer usually has a lower boiling point than the trans-isomer

Answer: D

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11. Which of the following pairs of compounds are geometrical isomers

A. Crotonic acid and cinnamic acid

B. Maleic acid and malonic acid

C. Ethylene dichloride and ethylidene dichloride

D. Maleic acid and fumaric acid

Answer: D

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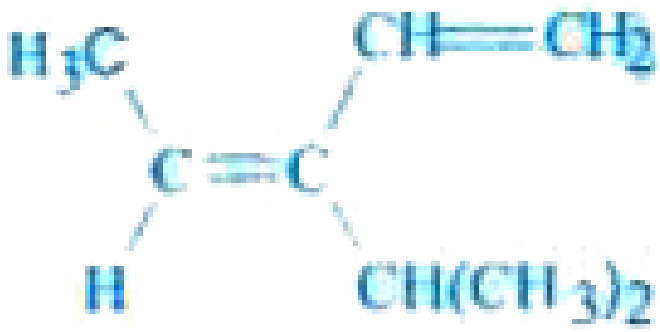

12.

A. E-isomer

B. Z-isomer

C. Cis-isomer

D. Trans-isomer

Answer: B

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13. Regarding geometrical isomers which is not correct

A. both cis and trans isomer posses same m.p

B. cis and trans isomers differ in solubilities

C. cis and trans isomers differ in dipole moment

D. cis and trans isomers exhibit similar but not identical chemical properties

Answer: A

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14. Which among the following compounds show geometrical isomerism

I)1- butene II) 2-butene III) 2-methyl-2-butene IV) 2-pentene

A. II,III

B. II,III,IV

C. II,IV

D. I,II,IV

Answer: C

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15. No.of geometrical isomers possible for the compound $CH_3 - CH = CH - CH = CH - C_2H_4$

A. 2

B. 3

C. 4

D. 5

Answer: C

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16. Geometrical isomerism is not shown by

A. $(CH_3CH_2)_2C = C - \underset{CH_3}{\underset{|}{C}} H_2CH_3$

B. $C_2H_5 - \underset{H}{\underset{|}{C}} = \underset{H}{\underset{|}{C}} - CH_2I$

C. $CH_3CH = C(Cl)CH_3$

D. $CH_3 - CH = CH - CH = CH_2$

Answer: A

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17. Find out the total number of isomers of possible for $C_2H_2F_2$

A. 2

B. 3

C. 4

D. 5

Answer: B

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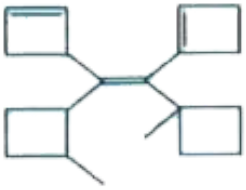
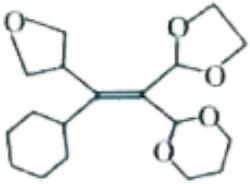
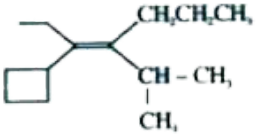
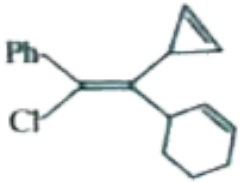
18. Which among the following is E-Isomer ?

A. 

B. 

C. 

D. 

Answer: D

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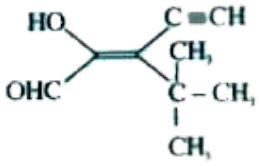
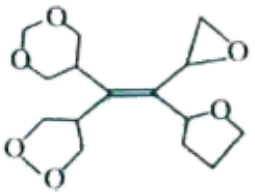
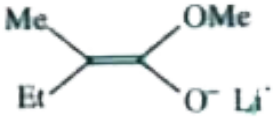
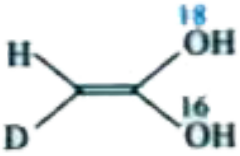
19. Which among the following is Z-Isomer ?

A. 

B. 

C. 

D. 

Answer: A

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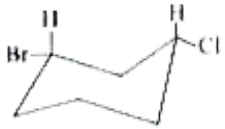
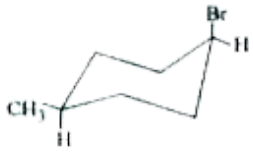
20. Determine which of the following compounds is a trans isomer ?

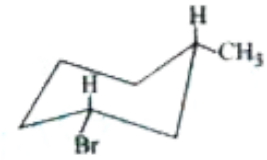
A.



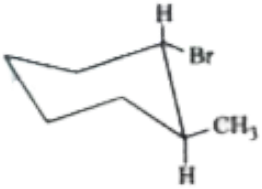
B.



C.



D.



Answer: D

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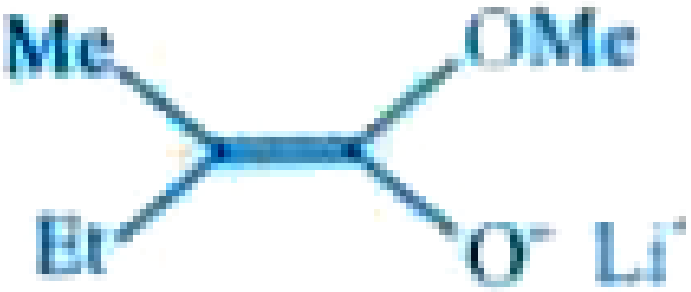

21.

Which of the following statement is correct regarding this structure ?

A. It is Cis

B. It is Trans

C. It is E

D. It is Z

Answer: C

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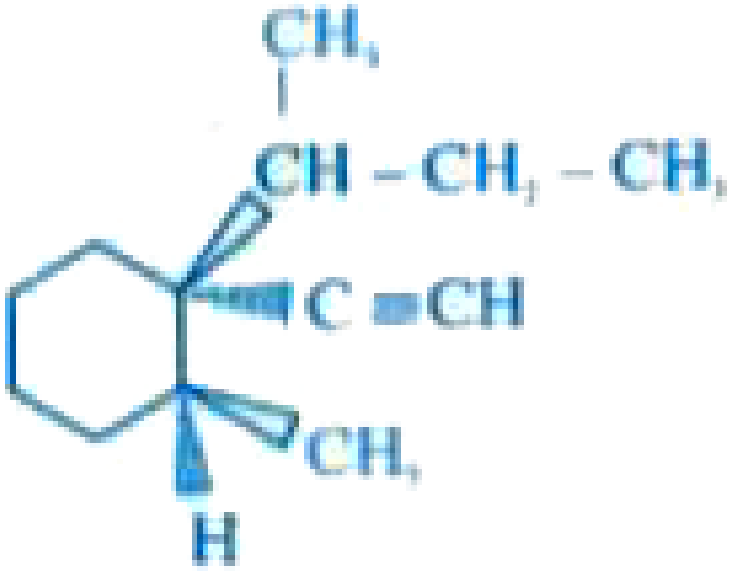

22.

Which of the following statement is correct regarding this structure ?

A. It is Cis

B. It is Trans

C. It is E

D. It is Z

Answer: C

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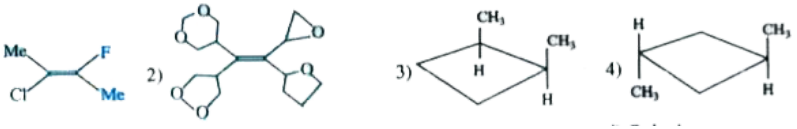
23. Which of the following molecule is E- isomer ?



A. a. 1 and 4

B. b. 2 and 4

C. c. 1, 2 and 4

D. d. only 4

Answer: C

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24. In the given structure

A. x, y and z represent Z-configuration

B. x, y and. z represent E-configuration

C. x and z represent E-configuration while y represents Z-configuration

D. x and z represent Z-configuration while y represents E-configurations

Answer: D

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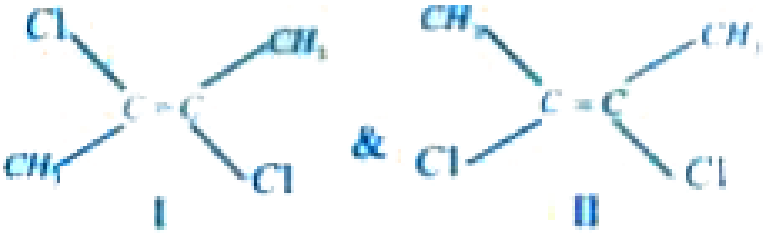
25. Which statement is/are right regarding



A. They are geometrical isomers

B. They are diastereoisomers

C. I is E-isomer and II is Z-isomer

D. They are enantiomers

Answer: A::B::C::D

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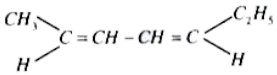
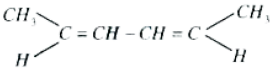
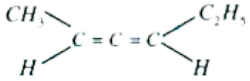
26. Which of the following can exist in three geometrical isomeric forms?

A. 

B. 

C. 

D. 

Answer: B::C

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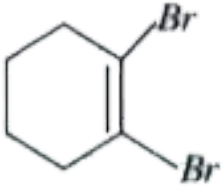
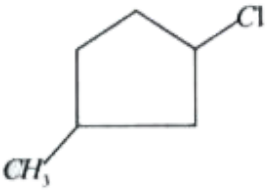
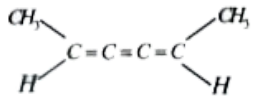
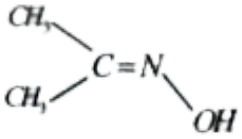
27. Which of the following can show geometrical isomerism

A. 

B. 

C. 

D. 

Answer: B::C

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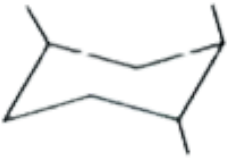
28. Which of the following trimethyl cyclohexanes is the least stable

A. 

B. 

C. 

D. 

Answer: B

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29. The molecules that will have dipole moment

A. 2,2-dimethylpropane

B. cis-2-pentene

C. 2,2,3,3-tetramethylbutane

D. trans-2-pentene

Answer: B::D

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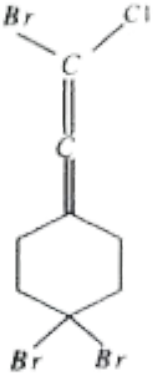
PRACTICE SHEET (EXERCISE-II (LEVEL-II) LINKED COMPREHENSION TYPE QUESTIONS)

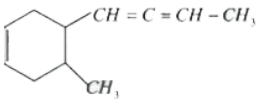
1. Those stereoisomers are called configurational isomers if they differ in spatial arrangement of atom or group and are not interconvertible without cleaving a bond. Geometrical isomer arises due to restricted rotation about a bond or centre. The number of G.I is 2^n where n= number of stereoisomers, in some cases the number of G.I is less than 2^n in case where either side nomenclature will be possible.

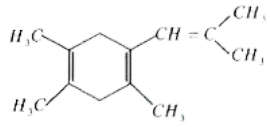
The number of G.I. of the compound $C_2H_5 - CH = CH - CH = CH - CH = CH - CH_3$ is

A.



B.



C. 

D. 

Answer: B

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2. Those stereoisomers are called configurational isomers if they differ in spatial arrangement of atom or group and are not interconvertible without cleaving a bond. Geometrical isomer arises due to restricted rotation about a bond or centre. The number of G.I is 2^n where n= number of stereoisomers, in some cases the number of G.I is less than 2^n in case where either side nomenclature will be possible.

The number of G.I. of the compound $C_2H_5 - CH = CH - CH = CH - CH = CH - CH_3$ is

A. 4

B. 3

C. 8

D. 6

Answer: C

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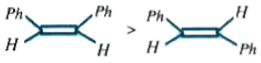
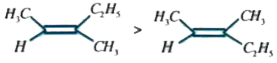
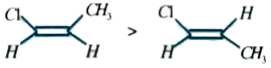
3. Those stereoisomers are called configurational isomers if they differ in spatial arrangement of atom or group and are not interconvertible without cleaving a bond. Geometrical isomer arises due to restricted rotation about a bond or centre. The number of G.I is 2^n where n= number of stereoisomers, in some cases the number of G.I is less than 2^n in case where either side nomenclature will be possible.

The number of G.I. of the compound $C_2H_5 - CH = CH - CH = CH - CH = CH - CH_3$ is

A. 

B. 

C. 

D. 

Answer: C

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4. Configuration isomerism is shown by the compounds in which groups or atoms are arranged with rigid part like double bonded atoms, cycle asymmetric centre etc. Geometrical isomerism is possible in case of double bonded atoms as well as in cycle. The phytical. Properties of geometrical isomer differs which is observed fact.

Which of the following is true for 2 - butene ?

A. cis-form-contain more b.p than trans form

B. trans-form-contain less m.p than cis form

C. cis-form is more stable than trans form

D. refractive index of cis form is less than tans form

Answer: A

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5. Configuration isomerism is shown by the compounds in which groups or atoms are arranged with rigid part like double bonded atoms, cycle asymmetric centre etc. Geometrical isomerism is possible in case of double bonded atoms as well as in cycle. The phytical. Properties of geometrical isomer differs which is observed fact.

Which of the following is correct?

A. cis-1,4-dimethyl cyclohexane will contains dipole moment value zero

B. trans- 1,3-dimethyl cyclohexane will contain dipole moment value zero

C. trans- 1,3 - dimethyl cyclobutane will contain dipole mament values zero

D. trans - 1,2-dimethyl cyclopropane will contain dipole moment value zero

Answer: C

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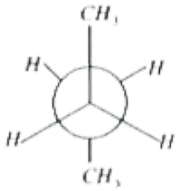
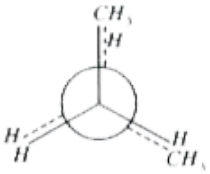
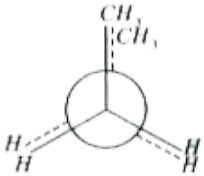
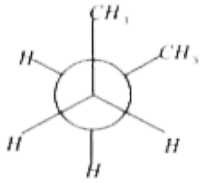
PRACTICE SHEET (EXERCISE-II (LEVEL-II) MATRIX MATCHING TYPE QUESTIONS)

Column-I	Column-II
A) 	P) 18.4 - 25.5 KJ/mol
B) 	Q) 14.2 KJ/mol
C) 	R) 3.3 KJ/mol
D) 	S) Zero

1.

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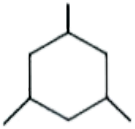
2.

Column-I	Column-II (Stereo Isomers)
A) $CH_3-CH=CH-CH=N-OH$	P) 2
B) 	Q) 4
C) $CH_3-CH=CH-CH=CH=CH-CH_3$	R) 6
D) $CH_3-CH=CH-CH=CH-\underset{CH_3}{CH}-Ph$	S) 8

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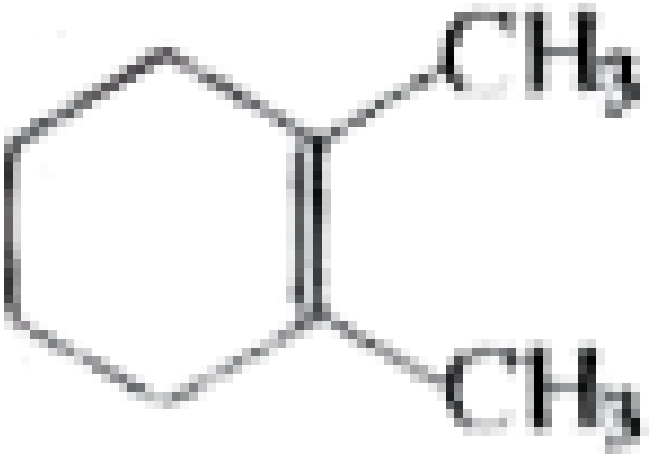
PRACTICE SHEET (EXERCISE-II (LEVEL-II) INTEGER TYPE QUESTIONS)

1.



The possible number of geometrical isomers for this compound which

can be isolated at room temperature is

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2. $CH_3 - CH = C = CH - CH_3$ The possible number of geometrical isomers of this diene is_____

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3. $CH_3 - CH = C = C = CH_2$ How many geometrical isomers of this triene are possible____

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PRACTICE SHEET (EXERCISE-III) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. In the representation of specific rotation $\left([\alpha]_D^{250C}\right)$, .D. indicates

A. Dextro rotation

B. Configuration of -OH group

C. Configuration of $-NH_2$ group

D. Wave length of light

Answer: D

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2. A molecule as a whole is asymmetric if it does not possess

A. Plane of symmetry only

B. Centre of symmetry only

C. Axis of symmetry and alternating axis of symmetry only

D. All

Answer: D

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3. For an optically active compound specific rotation $\left([\alpha]_D^{25}\right)$ depends on

a) Length of the polarimeter tube b)Concentration of solution

c) Polarimeter instrument d) Nature of the compound

A. all

B. only b and c

C. only a and c

D. a,b,d

Answer: D

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4. Which of the following exists in enantiomeric pair

A. n-butyl chloride

B. ter - butyl chloride

C. sec- butyl chloride

D. iso - butyl chloride

Answer: C

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5. When two or more isotopic atoms are connected to the asymmetric chiral carbon atom of the same element, the priority sequence is :

A. Isotope of higher mass preceeds over the lower

B. Isotope of lower mass preceeds over the higher

C. All the isotopes are equivalent

D. Most stable isotope preceeds over the unstable

Answer: A

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6. (A): Meso tartaric acid is optically inactive

(R): Meso tartaric acid has no asymmetric carbon

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. (A) is false but (R) is true

Answer: C

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7. ($\pm$) Lactic acid is optically inactive due to

A. Internal compensation

B. External compensation

C. Presence of plane of symmetry

D. Absence of asymmetric carbon

Answer: B

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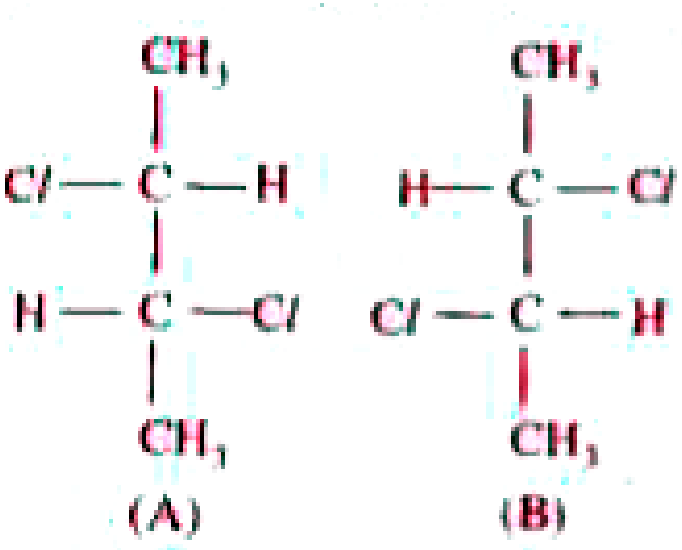
8.



If the specific rotation produced by the compound

'A'is $+52^\circ$, then the specific rotation of compound .B. is

A. -52°

B. $+52^\circ$

C. 0

D. Unpredictable

Answer: A

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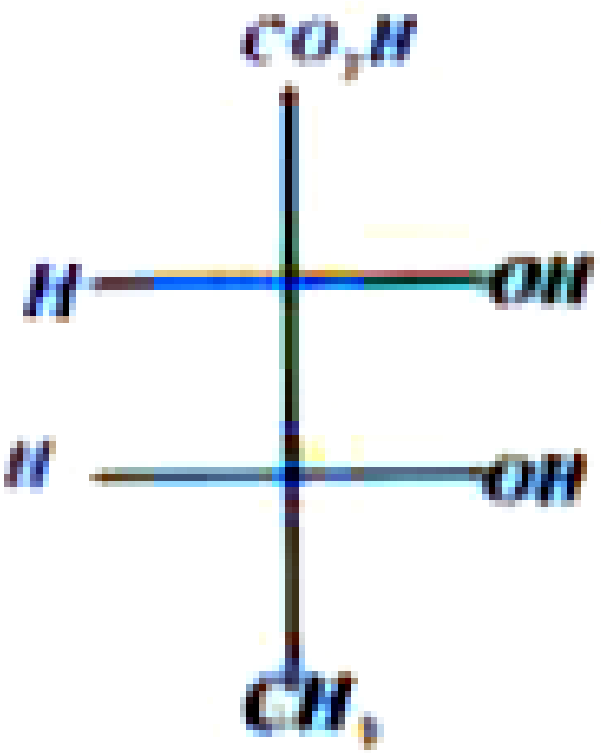
9. The incorrect statement about



A. It is erythro diastereomer

B. It has 2R, 3R configuration

C. It is meso form

D. (1) and (2)

Answer: C

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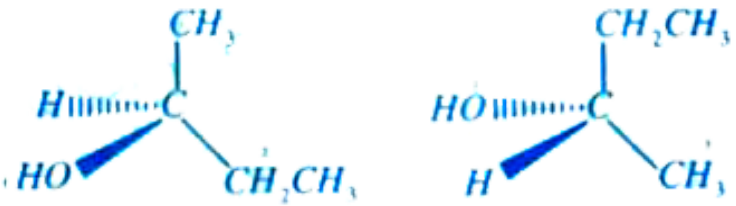
10. The pair of structures given below represent



A. Enantiomers

B. Identical

C. Achiral

D. Not stereo isomers

Answer: B

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11. Which of the following statements is not correct regarding enantiomers?

A. They have identical melting and boiling points

B. They have identical chemical properties except towards optically active reagents

C. They can be separated by fractional crystallization

D. They rotate the plane polarized light in opposite directions but to the same extent

Answer: C

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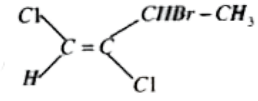
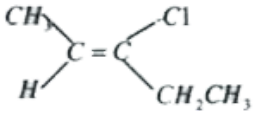
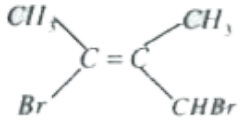
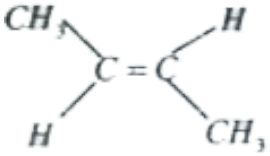
12. Which of the following can show optical isomerism

A. 

B. 

C. 

D. 

Answer: A

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13. 2, 3-pentadiene is optically active since it

A. contains one chiral carbon atom

B. contains two chiral atoms but the molecule as a whole is achiral

C. does not contain any chiral carbon atom but the molecule as a whole is chiral

D. none of the above

Answer: C

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14. How many chiral carbon atoms are present in 2, 3, 4 -trichoropentane?

A. 3

B. 2

C. 1

D. 4

Answer: A

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15. How many isomers could be obtained by replacing one hydrogen of propene with chlorine?

A. 2

B. 4

C. 3

D. 6

Answer: B

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16. For an optically active compound α_{obs} depends on

A. Concentration of the solution

B. Length of polarimeter tube

C. Nature of the compound

D. All the above

Answer: D

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17. Which statement is incorrect about diastereomers

A. They are non-mirror images

B. Physical properties are different

C. Both may or may not be optically active

D. Both possess identical optical rotation

Answer: D

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18. If a compound has 'n' different types of asymmetric carbon atoms then the maximum number of possible stereoisomers are

A. 2^{n-1}

B. 2^n

C. 3^n

D. 2n

Answer: B

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19. For tartaric acid total number of possible stereo isomers (configurations only) and total no. of possible optically active isomers are.

A. 4,4

B. 3,3

C. 4,2

D. 3,2

Answer: D

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20. Total number of possible isomers (configuartional only) for 2,3,4-trichlorohexane are

A. 2

B. 4

C. 8

D. 16

Answer: C

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PRACTICE SHEET (LEVEL-II) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. Maximum number of possible stereoisomers (configurational only) with the formula $CH_3CH = CHCH(CH_3)COOH$

A. 2

B. 3

C. 4

D. 6

Answer: C

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2. Maximum number of possible stereoisomers (configurational only) with the molecular formula $C_4H_{10}O$ are

A. 1

B. 2

C. 4

D. 7

Answer: B

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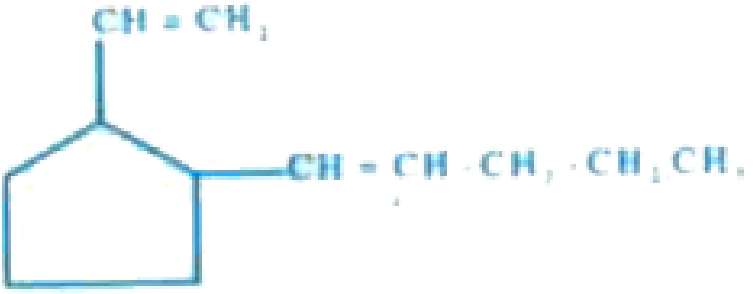
3. Number of stereoisomers possible for



are

A. 8

B. 16

C. 32

D. 64

Answer: A

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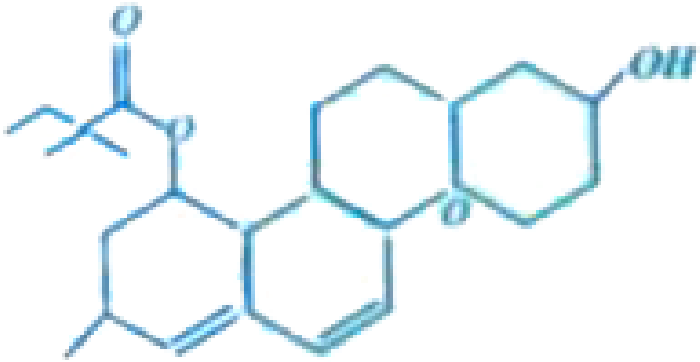
4. Number of stereogenic centers in the following compound are



A. 4

B. 7

C. 6

D. 9

Answer: B

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5. Pairs of enantiomers are :

A. I, II and III, IV

B. I, II

C. III, IV

D. IV, V

Answer: C

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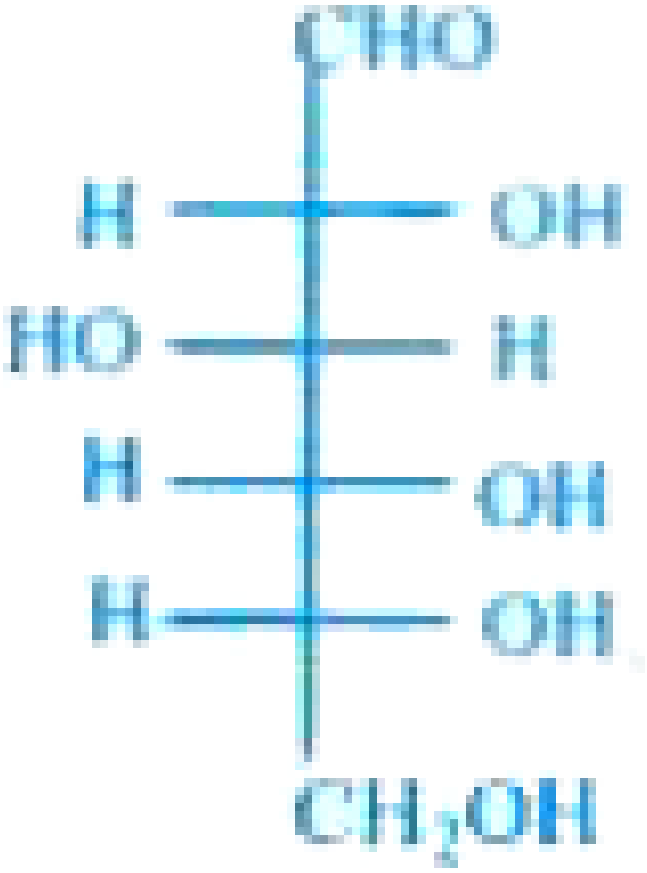
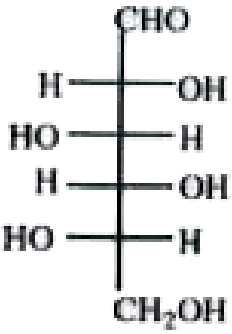
6. The structure of D-glucose was given here

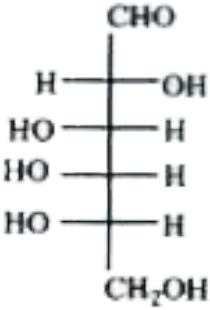


Which of the following structures repesent glucose

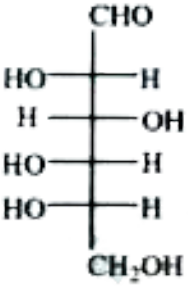
A.

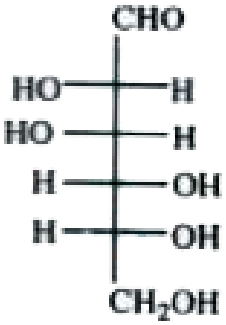

CHO
H
OH
HO
H
H
OH
HO
H
CH2OH

B.


CHO
H
OH
HO
H
HO
H
HO
H
CH2OH

C.


CHO
HO
H
H
OH
HO
H
HO
H
CH2OH



D.

Answer: C

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7.

Consider the above structures.

Which of the following statements is correct

A. I and II are enantiomers

B. II and III are enantiomers

C. II and IV are diastereomers

D. and III are enantiomers

Answer: D

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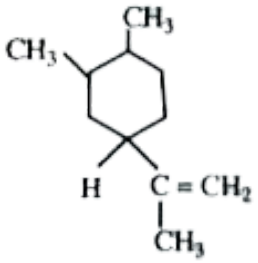
8. Which one of the following has no stereogenic center?

A.



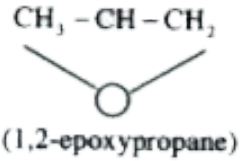
(l-imonene)

B.

(2-cyclopenten-1-ol)

C.

(3-cyclopenten-1-ol)



D.

Answer: C

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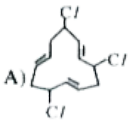
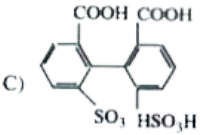
9. The chiral molecules are





A. A,B

B. B,C

C. A,C

D. A,B,C

Answer: D

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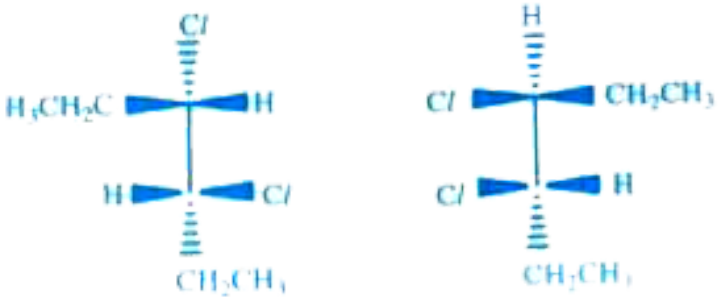
10. The molecule shown are



A. Enantiomers

B. Diastereomers

C. Constitutional isomers

D. Two conformation of the same molecule

Answer: B

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11. The molecules below are

A. Constitutional isomers

B. Enantiomers

C. Diastereomers

D. Identical

Answer: A

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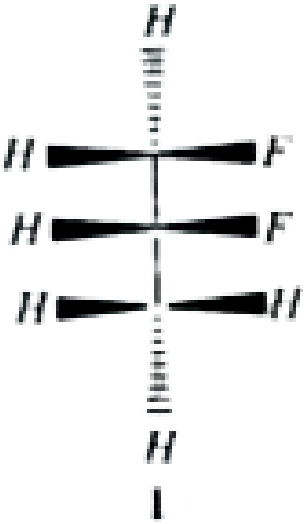
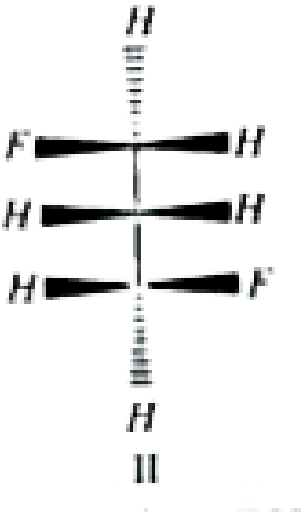
12. The molecules below are





A. Constitutional isomers

B. Enatiomers

C. Diasteromers

D. Identical

Answer: A

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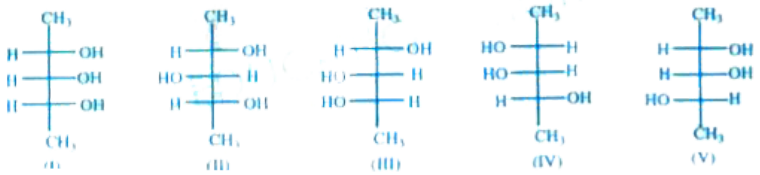
13. Which pair of structures represents the same compound?



A. a.I and II

B. b. II and III

C. c. III and IV

D. d. III and V

Answer: D

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14. In case of carbohydrates D, L indicates the

A. Configuration of - OH at last chiral carbon

B. Configuration of - OH at first chiral carbon

C. Configuration of - OH at second chiral carbon

D. Configuration of - OH at at all chiral carbon

Answer: A

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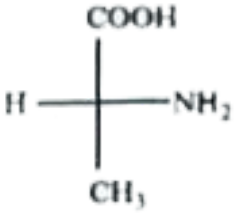
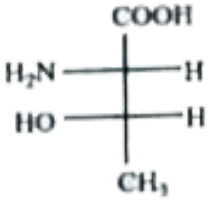
15. Among the following which has L- configuration

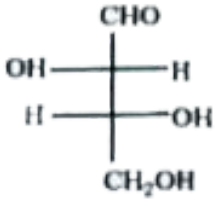
A.

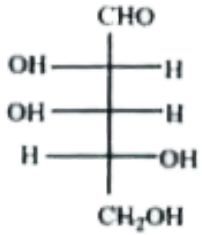


B.



C.



D. 

Answer: B

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16. Which of the following can be used for resolving racemic carboxylic acid.

A. $(-)Ph-\underset{CH_3}{\underset{|}{C}}H-NH_2$

B. $(\pm)-\underset{CH_3}{\underset{|}{C}}H_3-NH_2$

C. $Me-NH_2$

D. $Me_2CHNHMe$

Answer: A

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17. A compound contains two dissimilar asymmetric carbon atoms. The number of optical isomers is

A. 2

B. 3

C. 4

D. 5

Answer: C

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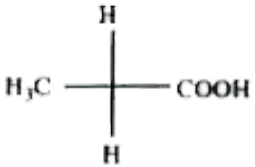
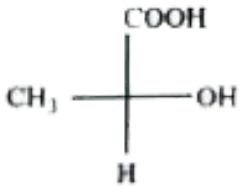
18. Which of the following compounds do not exhibit steroisomerism



A.



B.

C. $CH_3CH = CHCH_3$

D. $CH_3CH = CHCH_2CH_3$

Answer: A

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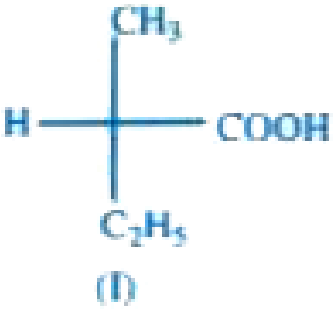
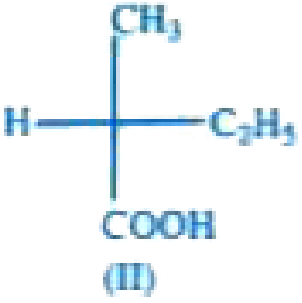
19. Which of the following statements regarding I and II is right



(I)



(II)

A. I and II identical

B. I and II are enantiomers

C. I and II do not exhibit optical activity

D. I is dextroratory II is leavoratory

Answer: B

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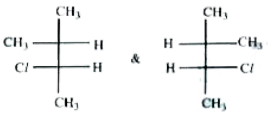
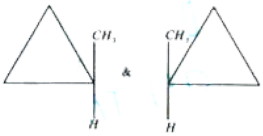
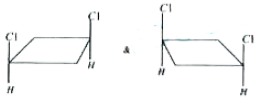
20. Which pair among the following is enantiomers

A. 

B. 

C. 

D. all the above

Answer: A

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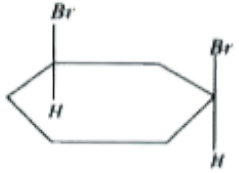
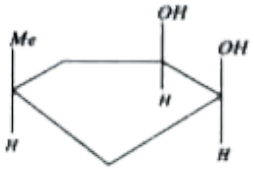
21. Which of the following compound is (meso) compounds?

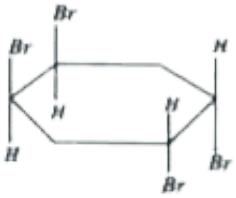
A.



B.



C.



D. All

Answer: D

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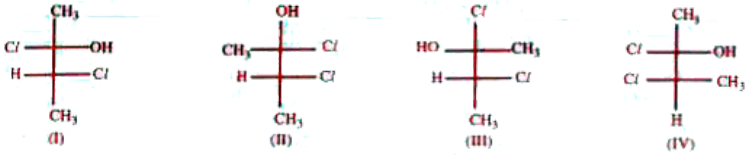
22. Which of the following Fisher projection formulae represents same stereoisomer



A. I,II

B. III and IV

C. I,II,III

D. I,II,III,IV

Answer: D

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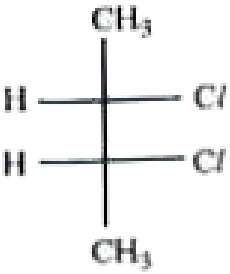
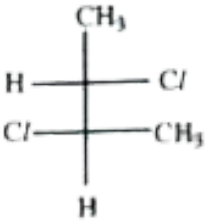
23. Which of the following representation of the Fischer projection formula is the meso isomer of 2, 3 dichlorobutane

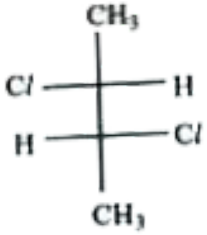
A.



B.



C.



D. both (a) and (b)

Answer: D

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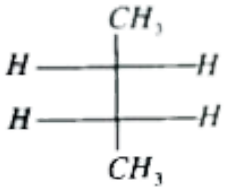
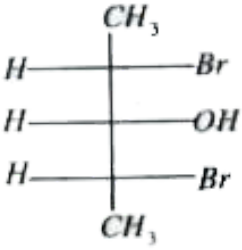
24. Which of the following compounds have plane of symmetry?

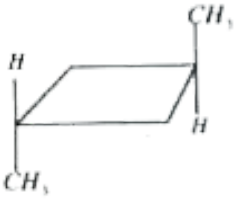
A.



B.



C.



D. all of these

Answer: D

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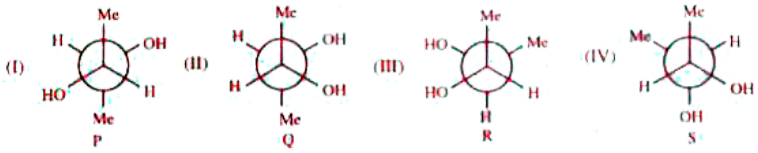
25. Among the following, the Newmann projection formula of meso-2, 3-butanediol are / is



A. I,II

B. I,III

C. III,IV

D. II,IV

Answer: B

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26.

I) (A) and (B) are diastereomers II) (B) and (D) are enantiomers

III) (A) and (D) are geometric isomer IV) (A) and (C) are optical isomer

A. only I is true

B. I, II & III are true

C. I & II are true

D. all are true

Answer: D

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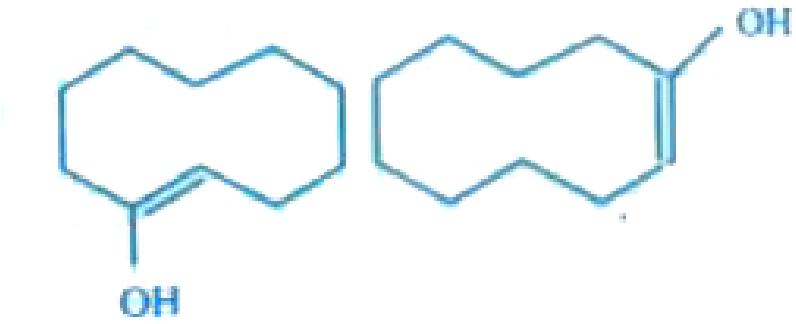
27. Correct relationship between the two structures given below is



A. enantiomers

B. tautormers

C. geometrical isomers

D. constitutional isomers

Answer: C

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28. 2,3-Butanediol has the 2R, 3R configuration Identify the correct statement among the following.

A. 2R, 3S - is its enantiomers

B. 2S, 3R - is its enantiomers

C. 2S, 3S - is its enantiomers

D. 2S, 3R - Is its diastereoisomer

Answer: C::D

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29. Which statement is true for meso compound?

A. There are one or more planes of symmetry

B. A single molecule is identical to its mirror image

C. More than one stereogenic centre must be present

D. The stereochemical lables, (R) and (S), must be identical for each sterogenic center

Answer: A::B::C

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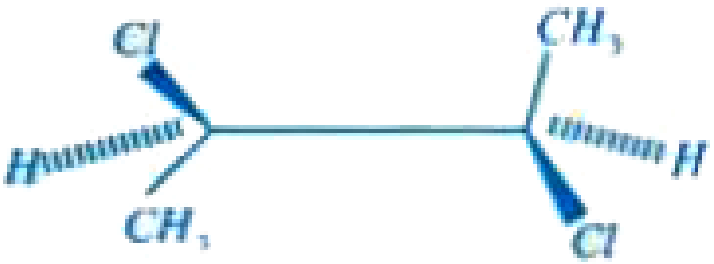
30. Correct statement about



A. compound is optically active

B. compound possess centre of symmetr

C. compound posses bp of symmetry

D. compound possess axis of symmetry

Answer: A::D

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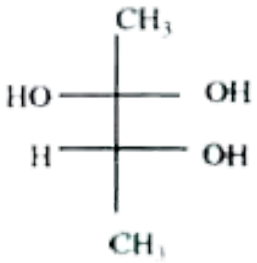
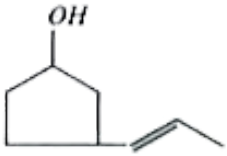
31. How many of the following have chiral centres

A. $H_3C - CH = C = CH - CH_3$

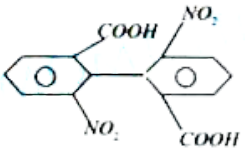
B.



C.



D.



Answer: A::B::C::D

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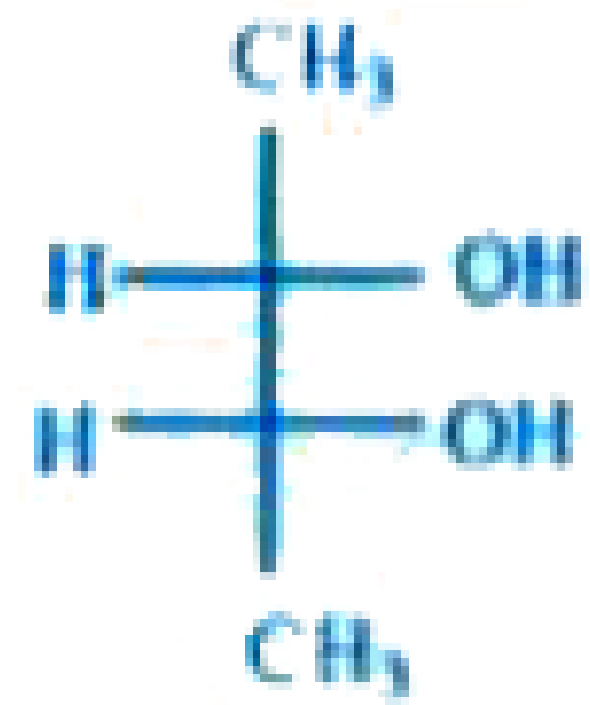
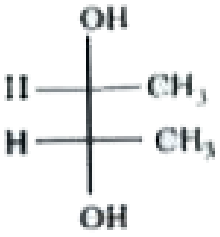
PRACTICE SHEET (LEVEL-II) MORE THAN ONE CORRECT ANSWER TYPE QUESTIONS)

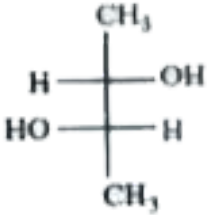
1. Which of the following is the diastereoisomer of

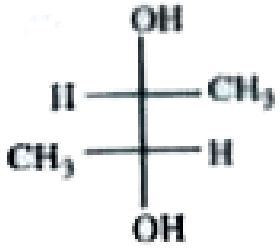


A.

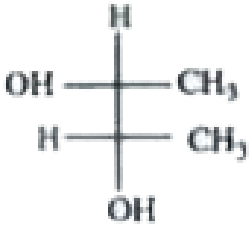


B.





C.



D.

Answer: B::C::D

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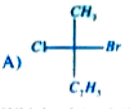
PRACTICE SHEET (LEVEL-II) LINKED COMPREHENSION TYPE QUESTIONS)

1. The necessary condition for a molecule to exhibit optical isomerism is dissymmetry or chiral. Thus all organic compounds which contain one as symetric carbon atom are chiral and exist in two stereoisomers. Although the two forms have the same structure, they have different arrangements

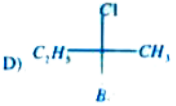
of groups about the as symmetric carbon. In fact, they represent as symetric molecules. They do not have a plane of symmetry. They are related to each other as an object to its mirror image and are non superimposable. The two structures actually stand for dextro or (+) and leavo or (-) isomers. Since they are related each other as mirror images, they are commonly called enantiomers.

Consider the following structures A,B,C,D

A) 

B) 

C) 

D) 

Which of the following statements is not correct

A. B and C are identical

B. A and B are enantiomers

C. A and C are enantiomers

D. B and D are enantiamers

Answer: D

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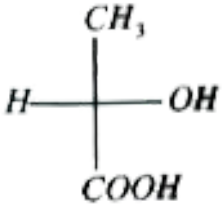
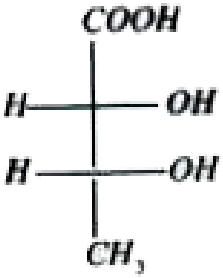
2. The necessary condition for a molecule to exhibit optical isomerism is dissymmetry or chiral. Thus all organic compounds which contain one assymetric carbon atom are chiral and exist in two stereoisomers. Although the two forms have the same structure, they have different arrangements of groups about the assymmetric carbon. In fact, they represent assymetric molecules. They do not have a plane of symmetry. They are related to each other as an object to its miror image and are non superimposable. The two structures actually stand for dextro or (+) and leavo or (-) isomers. Since they are related each other as mirror images, they are commonly called enantiomers.

Which of the following compounds is optically inactive

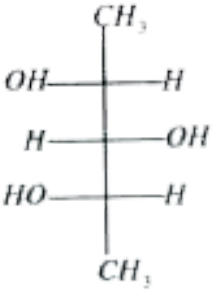
A.



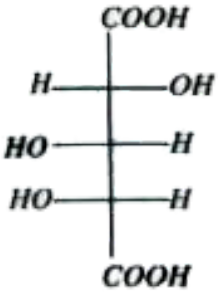
B.



C.



D.



Answer: C

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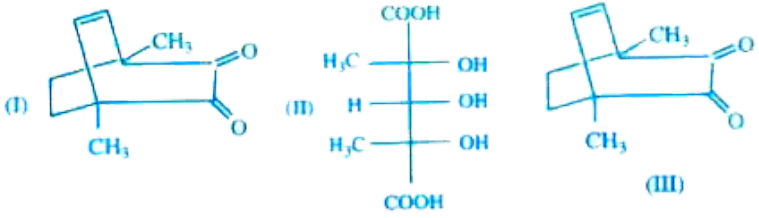
3. The necessary condition for a molecule to exhibit optical isomerism is dissymmetry or chiral. Thus all organic compounds which contain one as symetric carbon atom are chiral and exist in two stereoisomers. Although the two forms have the same structure, they have different arrangements of groups about the as symmetric carbon. In fact, they represent as symetric molecules. They do not have a plane of symmetry. They are related to each other as an object to its mirror image and are non superimposable. The two structures actually stand for dextro or (+) and leavo or (-) isomers. Since they are related each other as mirror images, they are commonly called enantiomers.

Which of the following statements is correct regarding compounds I to III



A. I is an achiral molecule

B. II contain three chiral centers

C. I and III are achiral molecules

D. III contains one chiral centre

Answer: A

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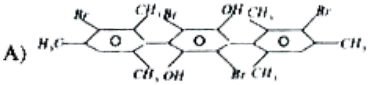
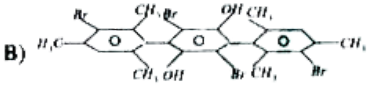
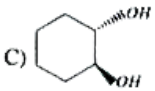
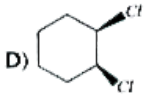
PRACTICE SHEET (LEVEL-II) MATRIX MATCHING TYPE QUESTIONS)

1.

Column-I (Compound)	Column-II (Nature)
A) 	P) Cis comound
B) 	Q) Trans compound
C) 	R) Optically active
D) 	S) optically inactive

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PRACTICE SHEET ((LEVEL-II) INTEGER TYPE QUESTIONS)

1. $CH_3 - CH = CH - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - CH_3$ number of racemic mixtures possible for the above compound are

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2. $CH_3 - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - CH_3$ the number of optical isomers possible for this compound are

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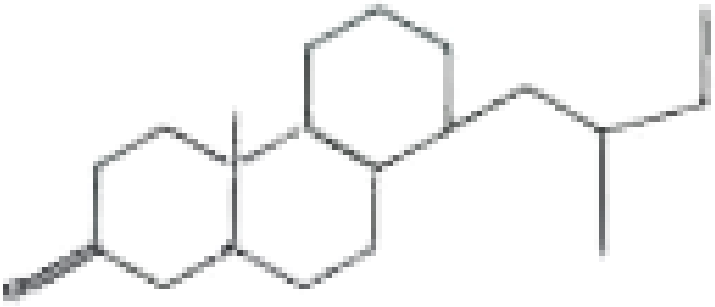
3. No. of chiral centers in the following compound is / are



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4. No. of possible cyclic isomers (including with stereo isomer) for the molecular formulae C_5H_{10}

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ADDITIONAL PRACTICE EXERCISE (LEVEL-I(MAIN) STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. Isoinerisin exhibited by secondary butyl chloride and tertiary.butyl chloride is

A. Chain isomerism

B. Geometrical isomerism

C. Optical isomerism

D. Positional isomerism

Answer: A

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2. In which of the following species is the underlined carbon having sp^3` hybridisation ?

A. CH_3COOH

B. CH_3CH_2OH

C. CH_3COCH_3

D. $CH_2 = CH - CH_3$

Answer: B

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3. The general formula $C_nH_{2n}O_2$ could be for open chain

A. Diketones

B. Carboxylic acids

C. Diols

D. Dialdehydes

Answer: B

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4. Of the five isomeric hexanes, the isomer which can give two mono chlorinated compounds is

A. n-Hexane

B. 2,3-Dimethylbutane

C. 2,2-Dimethylbutane

D. 2-Methylpentane

Answer: B

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5. Which one of the following does not have sp^2 hybridized carbon ?

A. Acetone

B. Acetic acid

C. Acetonitrile

D. Acetamide

Answer: C

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6. Number of isomers possible for dichloro cyclohexane

A. 8

B. 9

C. 6

D. 7

Answer: A

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7. Benzaldoxime can exist in two geometrical isomeric forms known as

A. cis and trans

B. dextro and levo

C. syn and anti

D. E and Z

Answer: C

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8. How many structural and geometrical isomers are possible for dimethlcyclohexane?

A. 3,6

B. 4,6

C. 6,4

D. 3,3

Answer: B

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9. Which of the following can show geometrical isomerism

A. 2,3 - dimethyl butane

B. 2,3-dimethyl-2-butene

C. 1,2 - dimethyl cyclo hexane

D. 2 - methyl pentane

Answer: C

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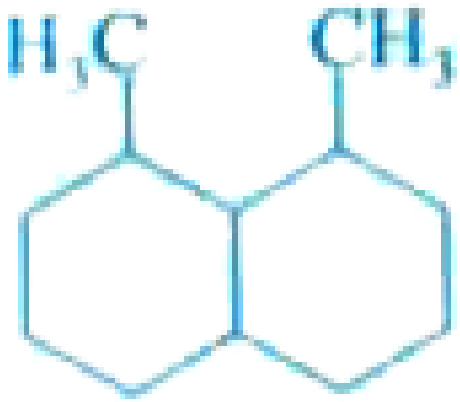
10. Number of chiral centres in the given compound



is /are

A. 1

B. 2

C. 3

D. 4

Answer: B

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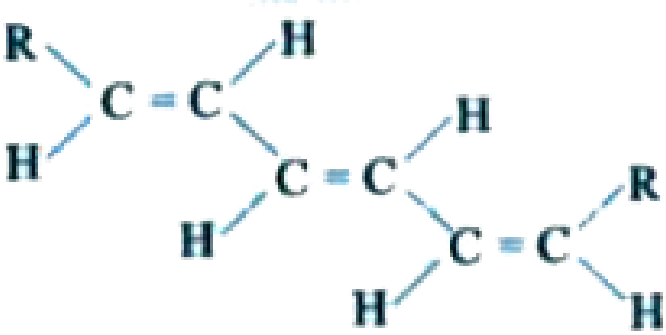
11. Number of the geometrical isomers for the molecule



A. 2

B. 4

C. 6

D. 8

Answer: C

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12. Which of the following does not show geometrical isomerism?

A. 1,2-Dichloro-1-pentene

B. 1,3-Dichloro 2 pentene

C. 1,1-Dichloro-1-pentene

D. 1,4-Dichloro-2-pentene

Answer: C

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13. The alkene that exhibits geometrical isomerism is

A. 2-methyl propene

B. 2-butene

C. 2-methyl-2-butene

D. propene

Answer: B

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14. The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature is

A. $-SO_3H,\ -COOH,\ -CONH_2,\ -CHO$

B. $-CHO,\ -COOH,\ -SO_3, H,\ -CONH_2$

C. $-CONH_2,\ -CHO,\ -SO_3H,\ -COOH$

D. $-COOH,\ -SO_3H,\ -CONH_2,\ -CHO$

Answer: D

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15. The number of stereoisomers possible for a compound of the molecular formula $CH_3 - CH = CH - CH(OH) - Me$ is

A. 2

B. 4

C. 6

D. 3

Answer: B

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16. Arrange the following compounds in the increasing order of their boiling points:

$(i) CH_3CH = CHCH_3 (cis) (ii) CH_3CH = CHCH_3$ (trans)

$(iii) CH_3CH = CHCl$ (cis) $(iv) CH_3CH = CHCl$ (trans)

A. (ii) lt (i) lt (iii) lt (iv)

B. (iv) lt (ii) lt (i) lt (iii)

C. (ii) lt (i) lt (iv) lt (iii)

D. (iii) lt (i) lt (ii) lt (iv)

Answer: C

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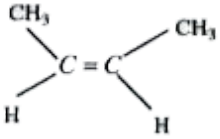
17. Which of the following hydrocarbons has the lowest dipole moment?

A. 

B. trans- $CH_3CH = CHCH_3$

C. $CH_3 - CH_2 - C \equiv C - H$

D. $CH_2 = CH - C \equiv CH$

Answer: B

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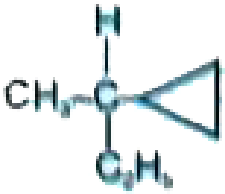
18. Amongst the following compounds, the optically acitve alkane having lowest molecular mass is

A. $CH_3 - CH_2 - CH_2 - CH_3$

B. $CH_3 - CH_2 - \overset{CH_3}{\underset{|}{C}} H - CH_3$

C. 

D. $CH_3 - CH_2 - C \equiv CH$

Answer: C

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19. Which of the following compounds is not chiral ?

A. 1-Chloropentane

B. 2-Chloropentane

C. 1-Chloro-2-methylpentane

D. 3-Chloro-2-methylpentane

Answer: A

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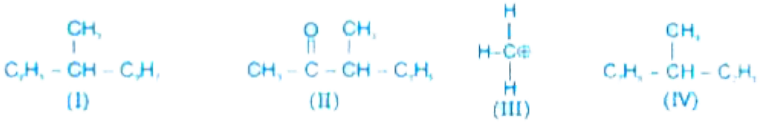
20. Among the following four structures I to IV.



it is true that

A. All four are chiral compoun

B. Only I and II are chiral compounds

C. Only III is a chiral compound

D. Only II and IV are chiral compounds

Answer: B

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21. Racemnic mixture is formed by mixing two

A. Isomeric compounds

B. Chiral compounds

C. Meso compounds

D. Optical isomers

Answer: D

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22. Which of the following will have a meso-isomer also ?

A. 2-Chlorobutane

B. 2,3-Dichlorobutane

C. 2,3-Dichloropentane

D. 2-Hydroxypropanoic acid

Answer: B

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23. Which type of isomerism is shown by 2,3-dichlorobutane ?

A. diastereomerism

B. optical-isomerism

C. geometric-isomerism

D. structural-isomerism

Answer: B

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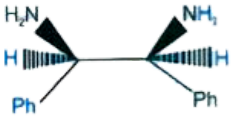
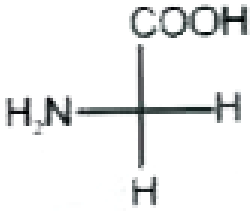
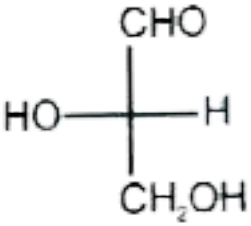
24. Which of the following molecules is expected to rotate the plane of polarized light?

A. 

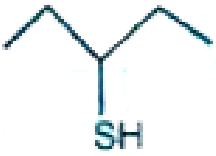
B.



C.



D.



Answer: C

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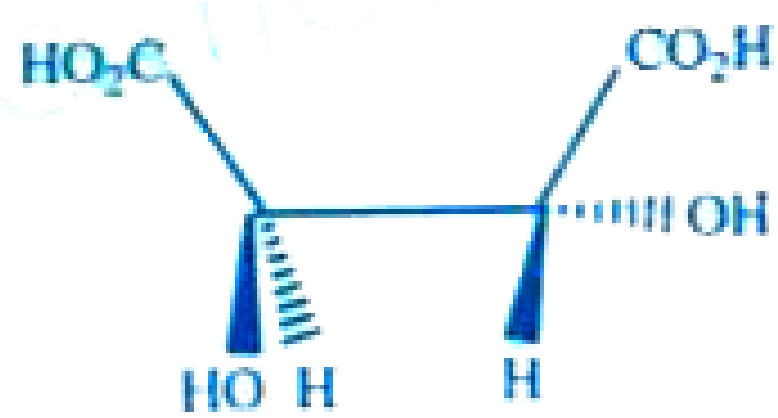
25. The absolute configuration of



is

A. R,R

B. R,S

C. S,R

D. S,S

Answer: A

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26. Out of the following the alkene that exhibits optical isomerism is

A. 3-methyl-2pentene

B. 4-methyl-1-pentene

C. 3-methyl-1-pentene

D. 2-methyl-2-pentene

Answer: C

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27. Which of the following statements best explain (s) the relationship between two stereoisomers of $CH_3CH = CHCH_3$?

A. They are diastereomers

B. They are enantiomers

C. They are optical isomers

D. Their melting points are identical

Answer: A

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28. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

A. 2

B. 4

C. 6

D. 8

Answer: B

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29. Which of the following molecules can be optically active

A. $CH_2 = C = CH_2$

B. $CH_2 = C = CHCl$

C. $ClCH = C = CHCl$

D. all the above

Answer: C

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30. Butyne and Butadiene are

A. Chain isomers

B. Functional isomers

C. Positional isomers

D. Metamers

Answer: B

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31. The number of geometrical isomers of $CH_3CH = CH - CH - CH = CH - Cl$

A. 2

B. 4

C. 6

D. 8

Answer: D

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32. Which of the following compounds can exhibit geometrical isomerism?

A. 1-phenyl-2-butene

B. 3-phenyl-1--butene

C. 2-phenyl-1-butene

D. 1,1-Diphenyl-1-propene

Answer: A

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33. A similarity between optical and geometrical isomerism is that

A. Each forms equal number of isomers for a given compound

B. If in a compound one is present, then so is the other

C. Both are included in stereo-isomerism

D. They have no similarity

Answer: C

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34. Which of the following compounds exhibits stereo isomerism

A. 2-methyl butene-1

B. 3-methyl butyne-1

C. 3-methyl butanoic acid

D. 2-methyl butanoic acid

Answer: D

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35. The number of carbon atoms present in a smallest alkane which can exhibit optical isomerism

A. 4

B. 5

C. 6

D. 7

Answer: D

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36. A compound with molecular formula, C_7H_{16}shows optical isomerism, the compound will be

A. 2, 3-dimethylpentane

B. 2,2-dimethylpentane

C. 2-methylhexane

D. 2,3-dimethylhexane

Answer: A

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37. The number of enantiomers of the compound $CH_3CHBrCHBrCOOH$ is

A. 0

B. 1

C. 3

D. 4

Answer: D

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38. Assertion (A): The boiling point of cis-2-butene is more than trans-2-butene

Reason (R): Cis-2-butene is more polar than trans

A. both A and R are true and R is the correct explanation of A

B. both A and R are true and R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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39. Assertion(A): Lactic acid is optically active compound

Reason (R): It contains a chiral centre with plane of symmetry

A. both A and R are true and R is the correct explanation of A

B. both A and R are true and R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C

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40. The chirality of the compounds $H_3C = \overset{\overset{Br}{|}}{\underset{\underset{Cl}{|}}{C}} - H$ is

A. R

B. S

C. E

D. Z

Answer: B

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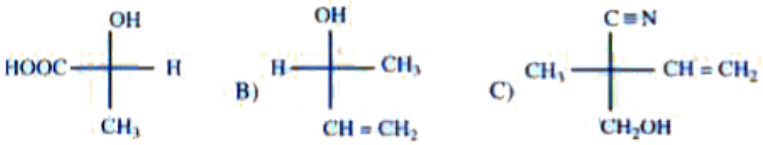
41. The compounds A, B, C have R or S configurations respectively



A. R,R,S

B. R,S,R

C. R,R,R

D. R,R,S

Answer: A

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42. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

A. 2

B. 4

C. 6

D. 8

Answer: B

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43. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

A. 2,2

B. 1,1

C. 1,2

D. 2,1

Answer: B

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44. Isopentane can form four structurally isomeric mono bromo derivatives. How many of them are cally active?

A. 1

B. 2

C. 3

D. 4

Answer: B

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45. Optically active compounds among the following is

A. $CH_3 - CH_2 - CHCl - CH_2 - CH_3$

B. $CH_3 - CH_2 - CDCl - CH_2 - CH_3$

C. $CH_3 - CH_2 - CHD - CH_2 - Ch_3$

D. $CH_3 - CH_2 - CHD - CH_3$

Answer: D

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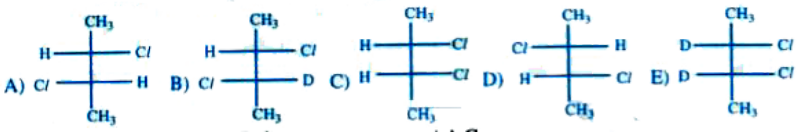
46. Which of the following form diastereomeric pair?



A. A,B

B. B,C

C. A,C

D. D,E

Answer: C

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47. The optical rotation of a solution of pure natural camphor is found to be $+5.76^\circ$ under the following conditions, concentration = 0.13g/ml, length of polarimeter = 1dm, wavelength = sodium D line, $T = 25^\circ C$. The specific rotation of camphor is

A. $+44.3^\circ$

B. $+26.7^\circ$

C. -26.7°

D. -44.3°

Answer: A

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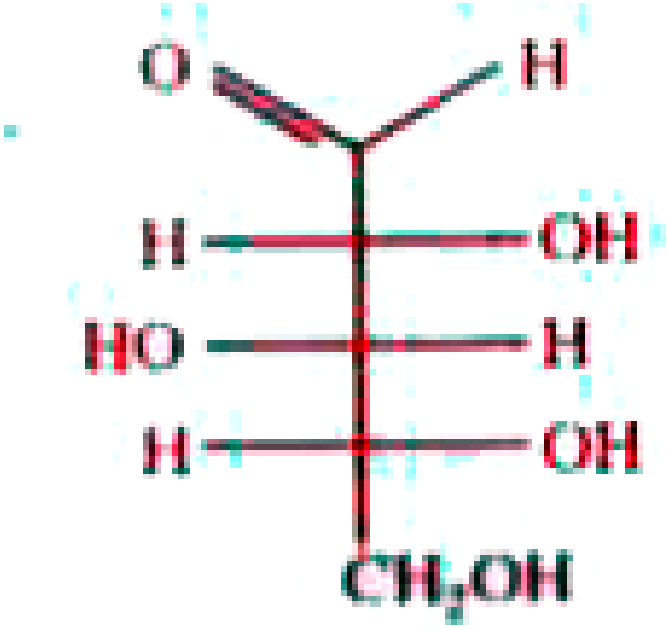
48. The R and S configuration for each sterogenic centre in this from top to bottom?



A. R,R,R

B. R,S,S

C. R,S,R

D. S,S,R

Answer: C

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49.  is

A. E-isomer

B. Z- isomer

C. Syn - isomer

D. Anti - isomer

Answer: C

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50. An enantiomerically pure acid is treated with racemic mixture of an alcohol having chiral carbon, The ester formed will be

A. mixture of diastereomers

B. mixture of enantiomers

C. meso compound

D. racemic mixture

Answer: A

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51. Which of the following is correctly matched?

A. tartaric acid-geometrical isomerism

B. fumaric acid-optical isomerism

C. lactic acid optical isomerism

D. malonic acid-geometrical isomerism

Answer: C

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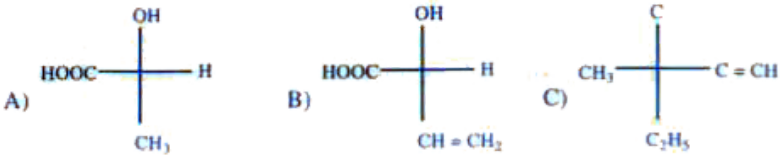
52. The configuration of the following compound A,B,C n R,S notation are



A. R,R,S

B. R,S,R

C. R,R,R

D. S,R,S

Answer: A

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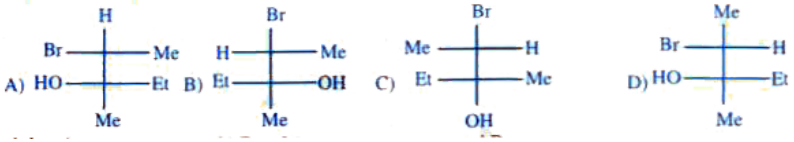
53. Which of the following structures are super imposable?



A. a and b

B. b and c

C. a and d

D. a and c

Answer: D

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54. Type of isomerism not possible with the molecular formula $C_4H_{10}O$ is

A. chain

B. optical

C. functional

D. geometrical

Answer: D

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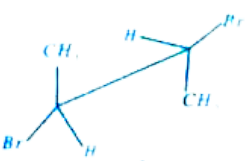
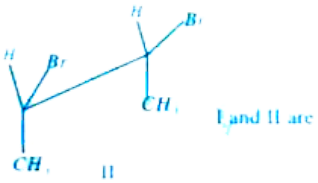
55. 

I



II

I and II are

A. A pair of optical isomers

B. A pair of conformers

C. A pair of geometrical isomers

D. Identical

Answer: B

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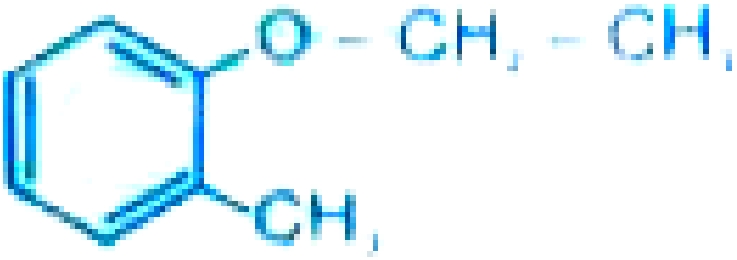
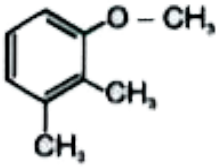
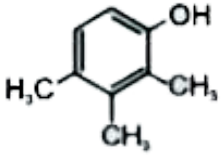
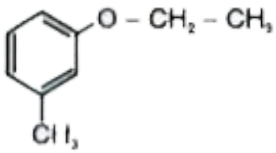
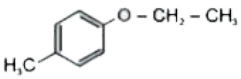
56. Which one is not metamer of



A. a. 

B. b. 

C. c. 

D. d. 

Answer: B

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57. If the recemic mixture of a carboxylic acid is treated with a dextro rotatory amino acid then the products formed are

A. A pair of enantiomers

B. A pair of diastereomers

C. Two optically inactive compounds

D. A mixture of compounds having same melting point and solubility

Answer: B

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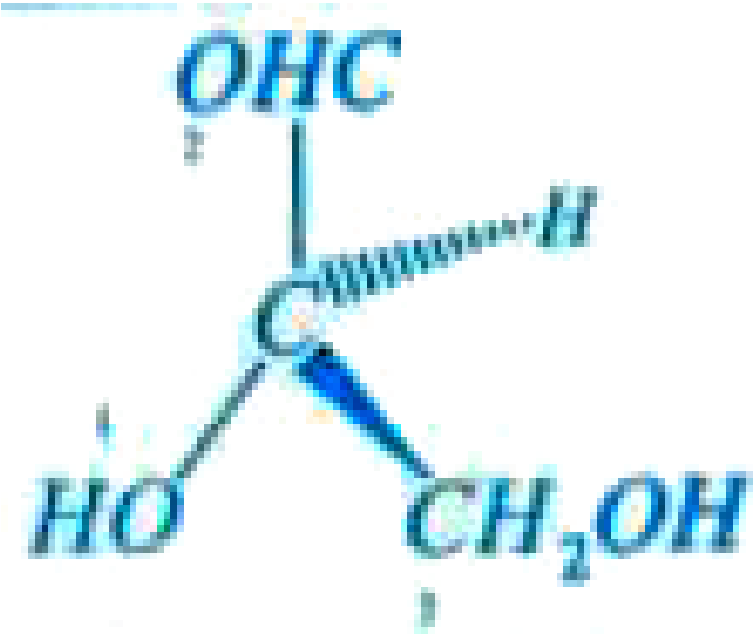
58. The configuration of



A. D and R

B. L and S

C. D and S

D. L and R

Answer: A

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59. Which one of the following can exist in optically active forms?

A. cis-1,3-Dichlorocyclohexane

B. trans-1,3-Dichlorocyclohexane

C. cis-1,4-Dichlorocyclohexane

D. trans-1,4-Dichlorocyclohexane

Answer: B

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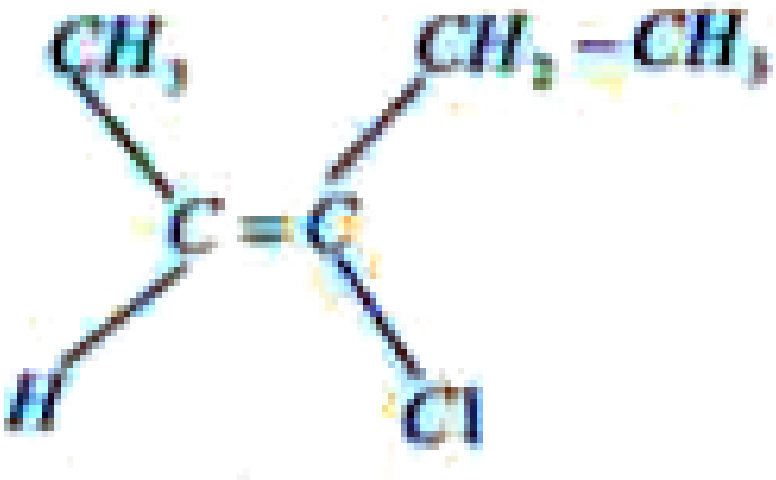
60. The name of the molecule shown is



A. cis-3-choro-2-pentene

B. monochloro-2-cis-pentene

C. trans-3-chloro-2-pentene

D. cis-3-chloro-3-pentene

Answer: A

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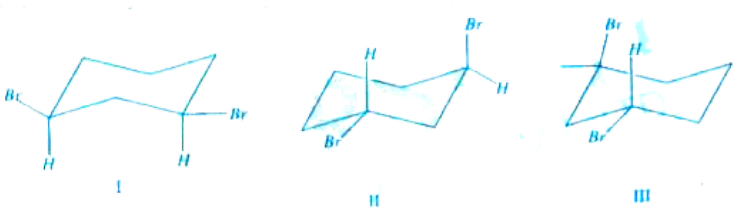
61. cis-1,3-Dibromocyclohexane is represented by structure(s):



A. I

B. II

C. III

D. II and III

Answer: A

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62. For the compound with molecular, formula $C_3H_5Br_3$. The number of optically active stereo isomers and total number of isomer are respectively

A. 2 and 6

B. 1 and 5

C. 2 and 4

D. 2 and 5

Answer: A

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63. Ortho nitro phenol and paranitro phenol are

A. Cis-trans isomerism

B. E, Z configuration

C. Positional isomerism

D. Tautomerism

Answer: C

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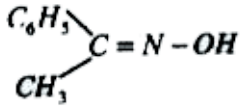
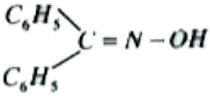
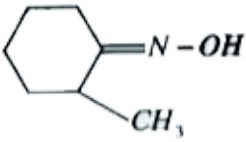
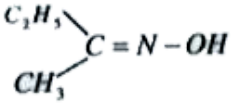
64. Which of the following oximes is expected to exhibit both geometrical and optical isomerism

A. 

B. 

C. 

D. 

Answer: C

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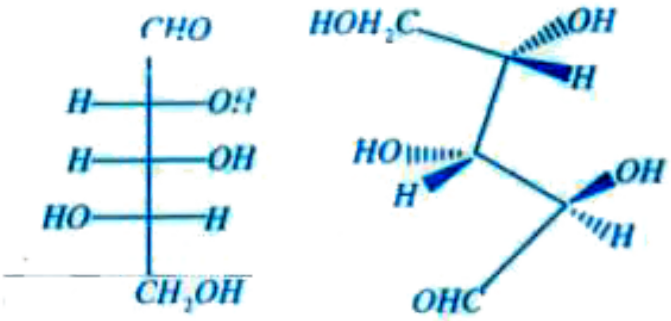
65. How are the following compounds related?



A. Enantiomers

B. Diastereo mers

C. Epimers

D. They are identical

Answer: D

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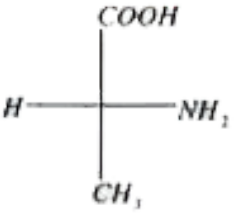
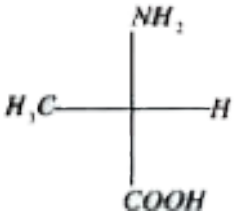
66. R-alanine is represented by

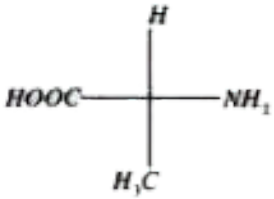
A.



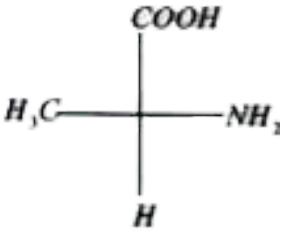
B.



C.



D.



Answer: A

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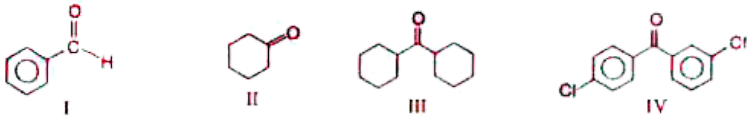
67. Which of the following will form only one oxime on reaction with NH,OH solution.



A. I,II

B. II,III

C. I,IV

D. II,III,IV

Answer: B

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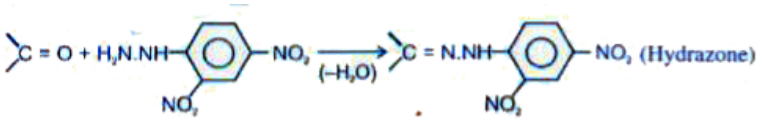
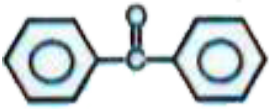
68. Ketones and aldehydes form water insoluble crystalline solids with phenylhydrazines as shown by the following reaction.

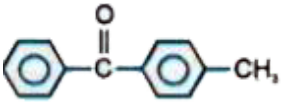


Which of the following compounds will produce a mixture of two diastereomeric hydrazones ?

A. 

B. CH_2O

C. 

D. 

Answer: D

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69. The optically active tartaric acid is named as D-(+)-tartaric acid because it has a positive.

A. optical rotation and is derived from D-glucose

B. pH in organic solvent

C. optical rotation and is derived from D-(+)-glyceraldehyde

D. optical rotation only when substituted by deuterium

Answer: C

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70. Optical activity is shown by a molecule which

A. Contains at least three asymmetric centres

B. Is asymmetric as a whole

C. Contains a double bond

D. Has a centre of symmetry

Answer: B

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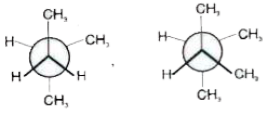
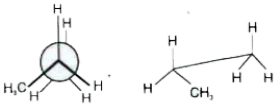
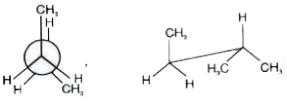
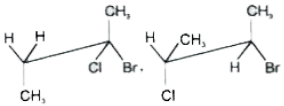
71. Which of the following pair is represent identical compound ?

A. 

B. 

C. 

D. 

Answer: B

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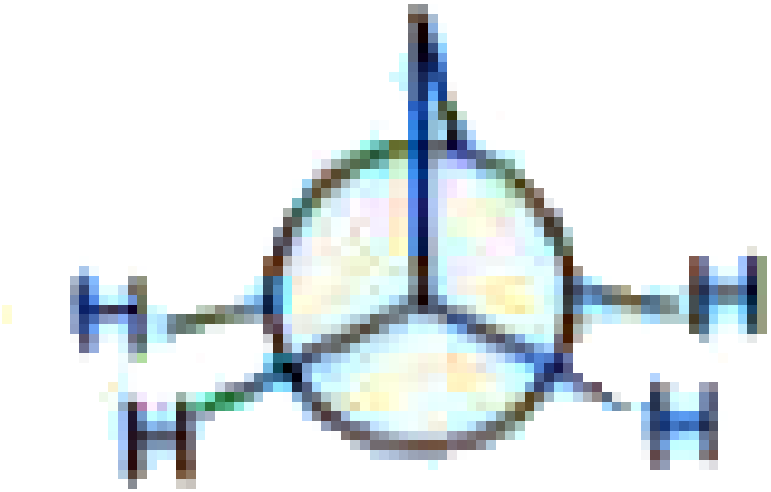
72. Compound



is a projection formula of:

A. a. Cyclohexane

B. b. Cyclopentane

C. c. Cyclobutane

D. d. Cyclopropane

Answer: D

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ADDITIONAL PRACTICE EXERCISE (LEVEL-II LECTURE SHEET (ADVANCED) MORE THAN ONE CORRECT ANSWER TYPE QUESTIONS)

1. Which of the following have zero dipole moment?

A. p-Dichlorobenzene

B. Benzene-1, 4-diol

C. Fumaric acid

D. Maleic acid

Answer: A::C

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2. Which of the following statements is/are not correct?

A. Metamerism belongs to the category of structural isomerism

B. Tautomeric structures are the resonating structures of a molecule

C. Keto form is always more stable than the enol form

D. Geometrical isomerism is shown only by alkenes

Answer: B::C::D

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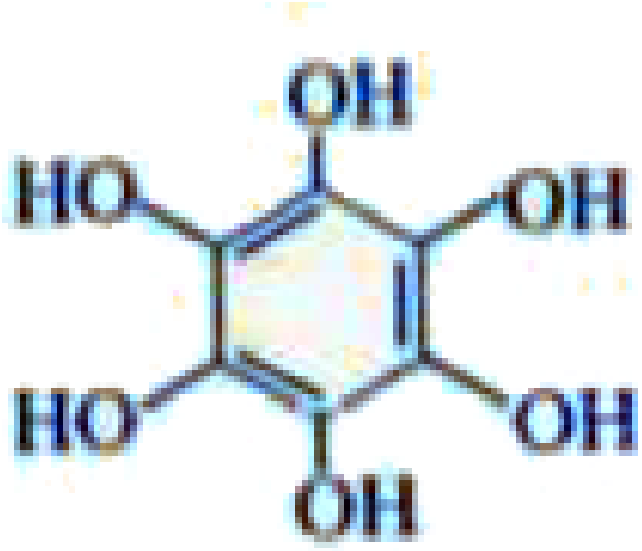
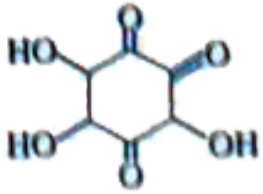
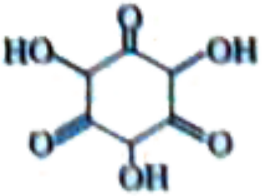
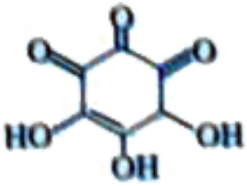
3. Tautomerism form of this compound is/are:



A. 

B. 

C. 

D. all of these

Answer: A::B

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4. Which of the following statements regarding 2-butene is / are right

A. It exists in two geometrical isomers

B. The two geometrical isomers have different boiling points

C. Hydrogenation is presence of Ni gives same alkane

D. The two geometrical isomers are diastereoisemers

Answer: A::B::C::D

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5. About meso tartaric acid which of the following statements is/are not correct

A. It is optically inactive due to internal compensation

B. It can be separated into two optically active isomers

C. It cannot be separated into two optically active isomers

D. It is optically inactive due to external compensation

Answer: A::B::D

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6. Which pair does represent isomers?

A. CH_3COOH and $HCOOCH_3$

B. $CH_3 - CHO$ and $CH_2 - CH - OH$

C. $CH_3 - CHO$ and $CH_3 - CO - CH_3$

D. $CH_3 - CO - CH_3$ and $CH_3 - CH_2 - CHO$

Answer: A::B::D

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7. The molecule $H_3C - CH = CH - undere \to verset(\ |\ )(CH_3)(C)H - COOH$ can exhibit

A. Geometrical isomerism only

B. Optical isomerism only

C. Conformational and optical isomerism

D. Tautomerism

Answer: A::B

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8. Which of the following statements is /are incorrect about two organic compounds which are stereoiso iners?

A. They must be enantiomers

B. They must be diastereomers

C. They must be constitutional isomers

D. They must have same molecular formula

Answer: A::B::C

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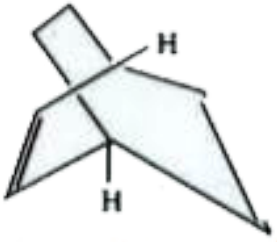
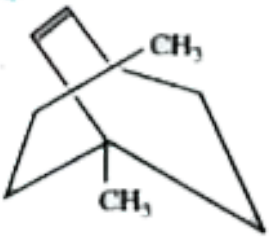
9. In which of the following molecules chiral centre(s) is/are not present

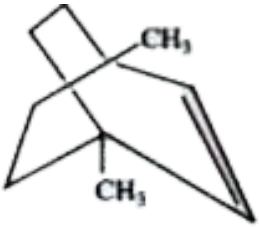
A.



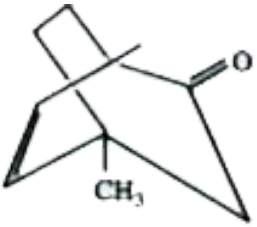
B.



C.



D.



Answer: A::B::C

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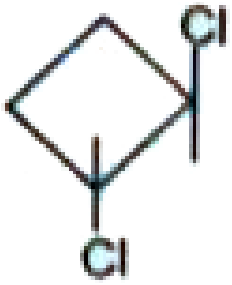
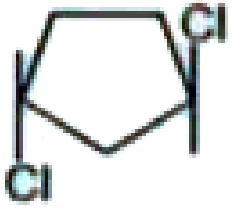
10. Mark out the optically active molecule :

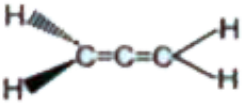
A.



B.



C.



D.

Answer: A::B::D

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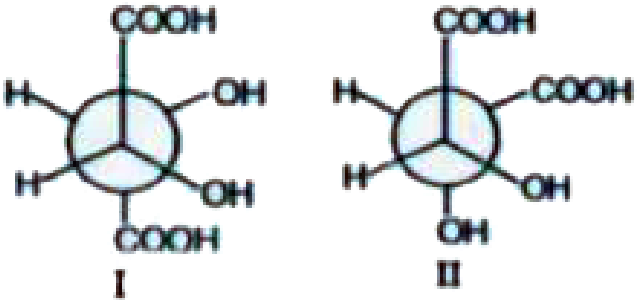
11. The structures I and II are :



A. Conformational diastereomers

B. Configurational enantiomers

C. Configurational diastereomers

D. Identical

Answer: C

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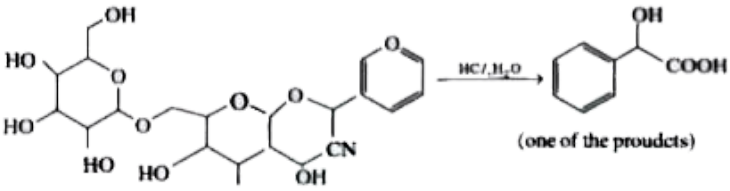
ADDITIONAL PRACTICE EXERCISE (LEVEL-II LECTURE SHEET (ADVANCED) LINKED COMPREHENSION TYPE QUESTIONS)

1. Amygdalin, a compound isolated from the pits of apricots, peaches and wild cherries. Although it has no known therapeutic value, it has been used as unsanctioned anticancer drug. One hydrolysis product formed from Amygdalin is mandelic acid used in common skin problems.



Number of stereogenic centers present in (A)

A. 10

B. 12

C. 11

D. 13

Answer: C

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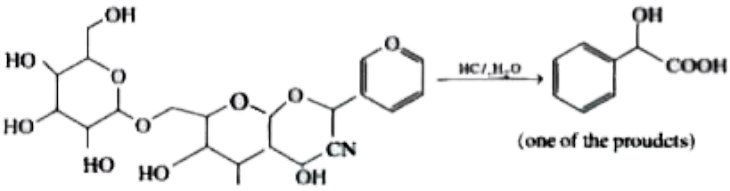
2. Amygdalin, a compound isolated from the pits of apricots, peaches and wild cherries. Although it has no known therapeutic value, it has been used as unsanctioned anticancer drug. One hydrolysis product formed from Amygdalin is mandelic acid used in common skin problems.



Number of stereogenic centers present in (A)

A. $+31^\circ$

B. -31°

C. $+62^\circ$

D. -62°

Answer: B

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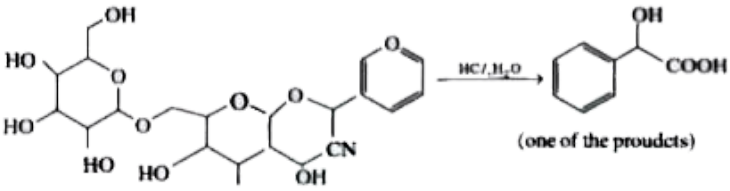
3. Amygdalin, a compound isolated from the pits of apricots, peaches and wild cherries. Although it has no known therapeutic value, it has been used as unsanctioned anticancer drug. One hydrolysis product formed from Amygdalin is mandelic acid used in common skin problems.



Number of stereogenic centers present in (A)

A. enantiomeric excess of solution is 50%

B. enantiomeric excess of solution is 60%

C. enantiomeric excess of solution is 32%

D. enantiomeric excess of solution is 80%

Answer: C

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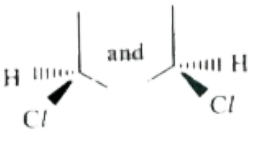
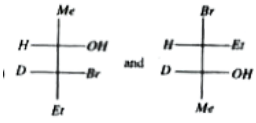
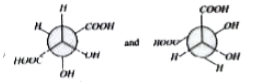
4. Structural isomers have different covalent linkage of atoms. Stereoisomers are compounds that have same sequence of covalent bonds but differ in the relative dispositions of their atoms in space. Geometrical and optical isomers are the two important types of configurational isomers. The compound with double bonds or ring structure have restricted rotation, so exist in two geometrical forms. The double bonds in larger rings (ring size 10 carbon large) can also cause geometrical isomerism. The optical isomers rotate the plane of plane-polarised light. A sp^3 -hybridised carbon atom bearing four different types of substituents is called an asymmetric centre or chiral centre. A chiral object or molecule cannot be superimposed on its mirror image. Stereoisomers that are mirror images of each other are called enantiomers. The stereosomers that the pot mirror images of each other are called diastereomers. Diasteremers have different physical properties. A racemic mixture is optically inactive and contains equal amounts of both the enantiomers. Resolution refers to method of separating a racemic mixture. Into two pure enantiomers. A meso compound is an optically inactive stereoisomer, which is achiral due to the presence of an

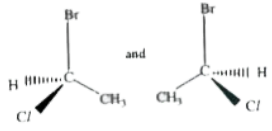
internal plane of symmetry or centre of symmetry within the molecule.

The pair of showing identical species is

A. 

B. 

C. 

D. 

Answer: A

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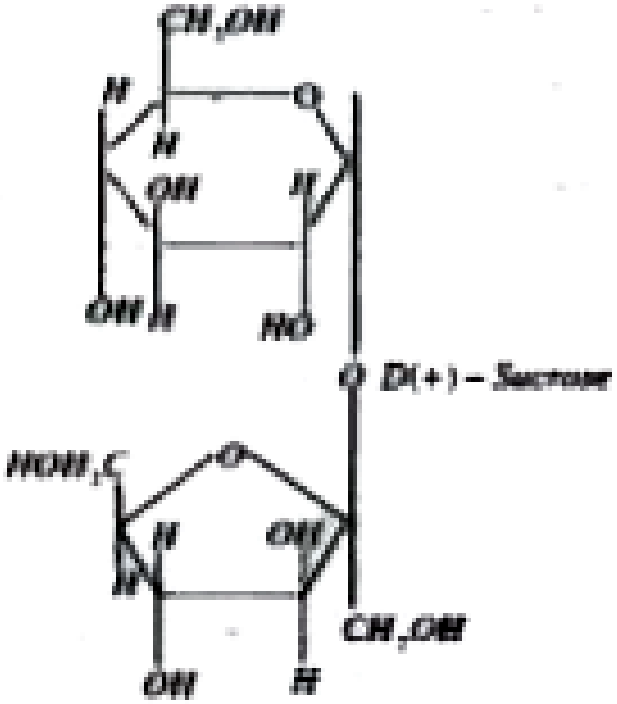
5. Structural isomers have different covalent linkage of atoms. Stereoisomers are compounds that have same sequence of covalent bonds but differ in the relative dispositions of their atoms in space. Geometri cal and optical isomers are the two important types of

configurational isomers. The compound with double bonds or ring structure have restricted rotation, so exist in two geometrical forms. The double bonds in larger rings (ring size 10 carbon large) can also cause geometrical isomerism. The optical isomers rotate the plane of plane-polarised light. A sp^3-hybridised carbon atom bearing four different types of substituents is called an asymmetric centre or chiral centre. A chiral object or molecule cannot be superimposed on its mirror image. Stereoisomers that are mirror images of each other are called enantiomers. The stereosomers that the pot mirror images of each other are called diastereomers. Diasteremers have different physical properties. A racemic mixture is optically inactive and contains equal amounts of both the enantiomers. Resolution refers to method of separating a racemic mixture. Into two pure enantiomers. A meso compound is an optically inactive stereoisomer, which is achiral due to the presence of an internal plane of symmetry or centre of symmetry within the molecule.

The number of chiral centres present in the following compounds is



A. 7

B. 8

C. 9

D. 10

Answer: C

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6. Structural isomers have different covalent linkage of atoms. Stereoisomers are compounds that have same sequence of covalent bonds but differ in the relative dispositions of their atoms in space. Geometrical and optical isomers are the two important types of configurational isomers. The compound with double bonds or ring structure have restricted rotation, so exist in two geometrical forms. The double bonds in larger rings (ring size 10 carbon large) can also cause geometrical isomerism. The optical isomers rotate the plane of plane-polarised light. A sp^3 -hybridised carbon atom bearing four different types of substituents is called an asymmetric centre or chiral centre. A chiral object or molecule cannot be superimposed on its mirror image. Stereoisomers that are mirror images of each other are called enantiomers. The stereosomers that the pot mirror images of each other are called diastereomers. Diasteremers have different physical properties. A racemic mixture is optically inactive and contains equal amounts of both the enantiomers. Resolution refers to method of separating a racemic mixture. Into two pure enantiomers. A meso compound is an optically inactive stereoisomer, which is achiral due to the presence of an

internal plane of symmetry or centre of symmetry within the molecule.

The following two compounds are

I

II

A. Identical

B. Conformational isomers

C. Geometrical isomers

D. Structural isomers

Answer: C

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ADDITIONAL PRACTICE EXERCISE (LEVEL-II LECTURE SHEET (ADVANCED) MATRIX MATCHING TYPE QUESTIONS)

1.

Column-I	Column-II
A) C_7H_{16}(No. of strctural isomers)	P) 6
B) C_2FCl Br I(No. of strctural isomers)	Q) 3
C) C_6H_4 Br Cl(No. of Benzonoid Aromatic isomers)	R) 5
D) C_5H_{10}(No. of cyclic isomers)	S) 9

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2.

Column-I (Benzene derivative)	Column-II (No. of isomers Theoretical)
A) Dichloroborazine	P) 3
B) Bromochloroborazine	Q) 4
C) Trichlorobenzene	R) 6
D) Bromodichlorobenzene	S) 8

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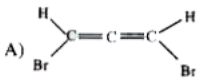
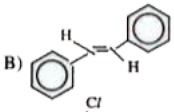
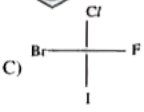
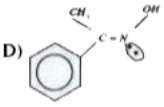
3.

Column-I	Column-II
A) 	P) Chiral centers containing compound
B) 	Q) Presence of stereocenter
C) 	R) Optically active compound
D) 	S) Compound containing plane of symmetry

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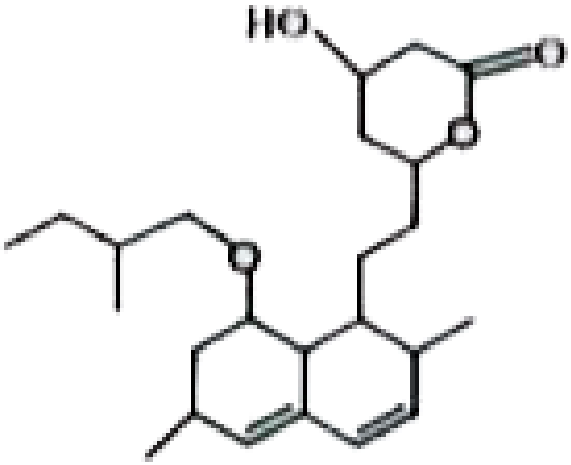
ADDITIONAL PRACTICE EXERCISE (LEVEL-II LECTURE SHEET (ADVANCED) INTEGER TYPE QUESTIONS)

1. How many sterogenic centers are there in Lovastain (Mevacor(R): a cholsesterol-lowering drug?



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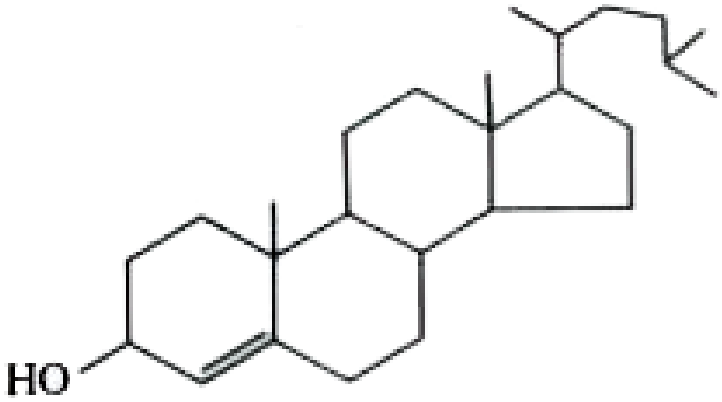
2. Identify how many chiral atoms are present in the following well known compound called cholesterol



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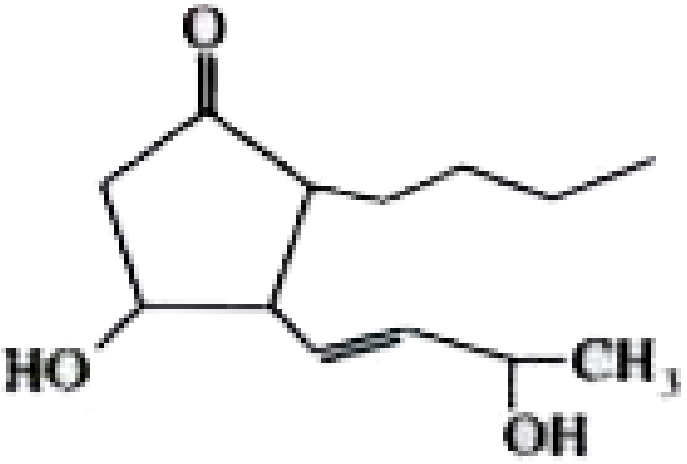
3. How many steriogenic centre is present for the given structure



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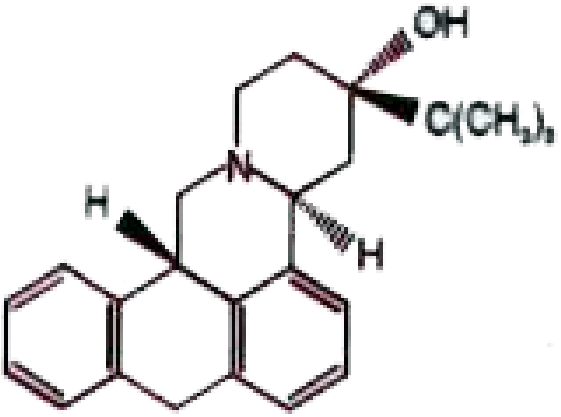
4. Butaclamol is potent antipsychotic that has been used clinically in the treatment of schizophrenia. Although patients are given a racemic mixture of the drug, only the (+)-enantiomer has pharmacological activity. How many chirality centres does butaclamol have ?



Butaclamol

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5. No. of possible isomeric dioic acids for the molecular formulae $C_4H_4O_4$ are

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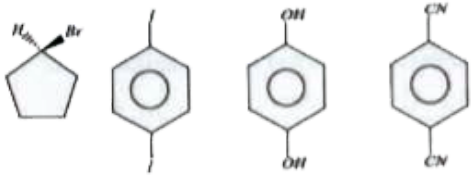
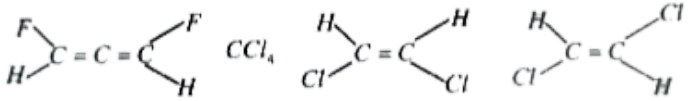
6. No. of compounds having net dipole moment are





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7. Find the number of enantiomeric pairs that can be produced during the monochlroination of n-pentane is

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8. How many structural cyclic isomers of C_5H_{10} are possible?

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9. The minimum number of carbon atoms to be present in a carboxylic acid to exhibit optical activity is

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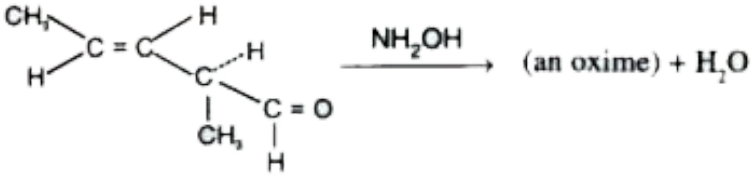
10. Find the possible number of stereoisomers formed in the following reaction would be :



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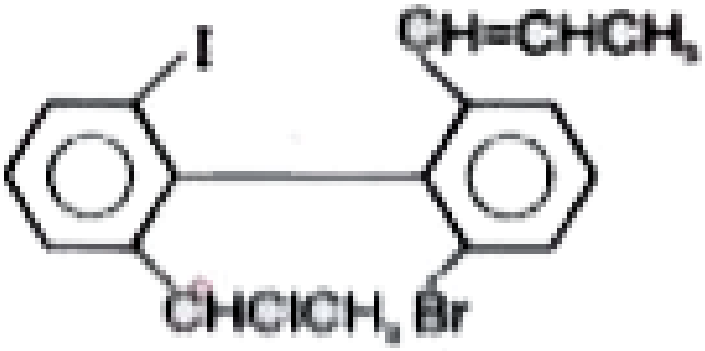
11. How many spatial orientations are possible in the following compound ?



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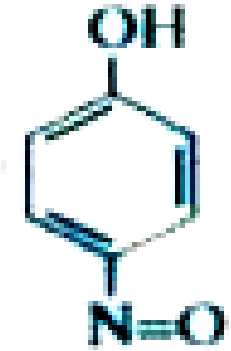
ADDITIONAL PRACTICE EXERCISE (PRACTICE SHEET (ADVANCED) MORE THAN ONE CORRECT ANSWER TYPE QUESTIONS)

1. Which compound show tautomerism:

A. 

B.

C.



D. none of these

Answer: A::C

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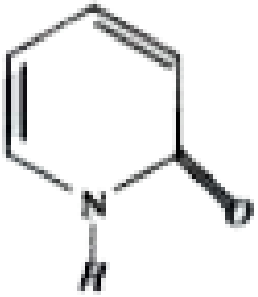
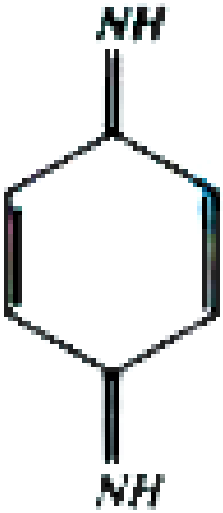
2. Which of the following compounds exhibits Tautomerism

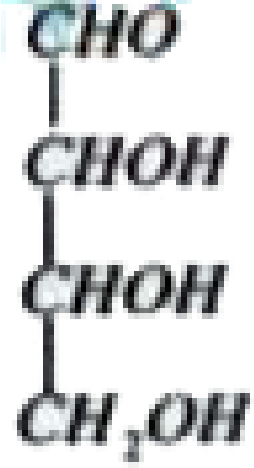
A.



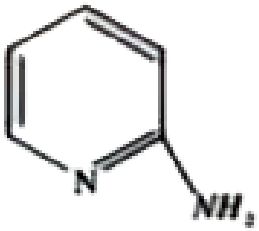
B.



C.



D.



Answer: A::C::D

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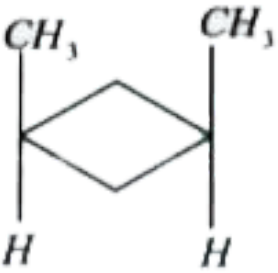
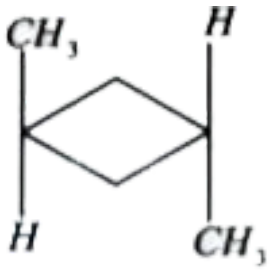
3. Which of the following niolecule does not contain chiral centre (s)

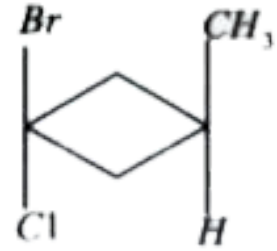
A.



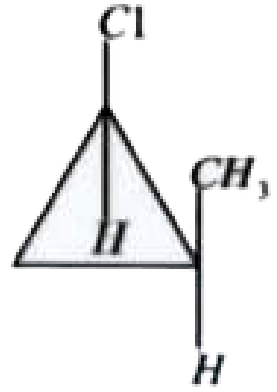
B.



C.



D.



Answer: A::B::C

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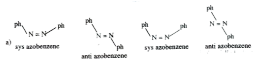
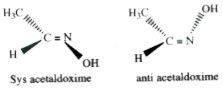
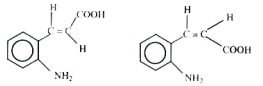
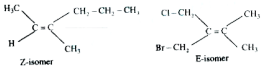
4. For which of the following pairs of compounds are the CORRECT notation given

A. 

B. 

C. 

D. 

Answer: A::B::C

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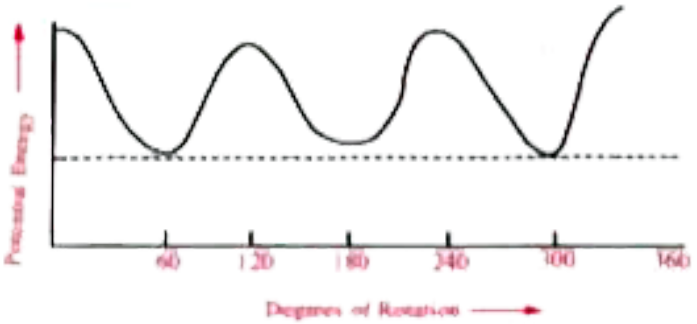
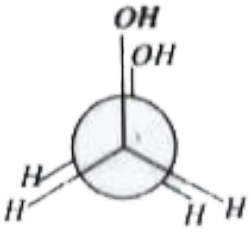


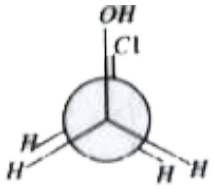
5.

Configuration structure of which compound (s) correctly predict the potential energy diagram.

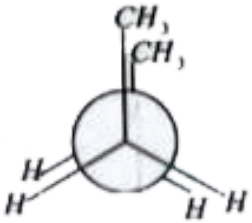
A.

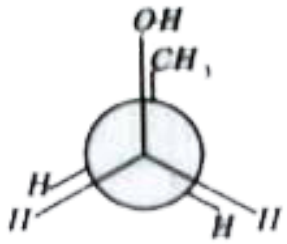


B.



C.



D. 

Answer: A::B

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6. Which of the following statement is right

A. R and S configurational isomers of a compound are enantiomers

B. D and L configurational isomers of a compound are enantiomers

C. cis-2-butene and trans-2-butene are a pair of diastereoisomers

D. All the E-isomers are trans-isomers

Answer: A::B::C

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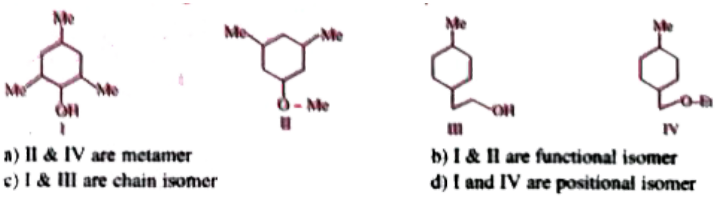
7. Which of the following is not the correct relationship



a) II & IV are metamer
b) I & II are functional isomer
c) I & III are chain isomer
d) I and IV are positional isomer

A. I & II are functional isomer

B. I & II are functional isomer

C. I & III are chain isomer

D. I and IV are positional isomer

Answer: A::D

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8. Which of the following alkanes give only one mono-chloro derivative

A. 2, 3-dimethylbutane

B. Cyclohexane

C. 2, 2-dimethylpropane

D. Ethane

Answer: B::C::D

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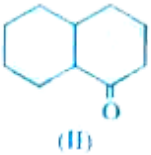
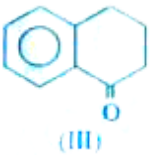
9. The correct order of % enol content.

(I)



(II)



(III)

A. a. $III > I$

B. b. $III > II$

C. c. $II > I$

D. d. $I > II$

Answer: A::B::D

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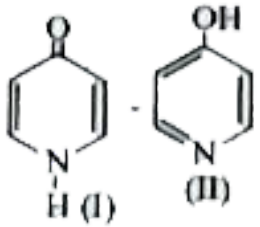
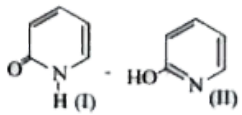
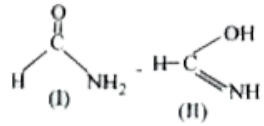
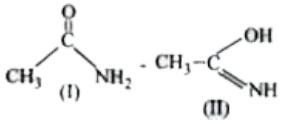
10. In Which of the following pairs I is more stable than II ?

A. 

B. 

C. 

D. 

Answer: A::B::C::D

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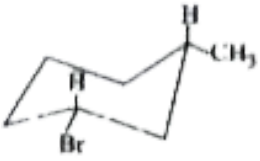
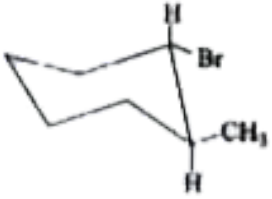
11. Determine which of the following compounds is a trans isomer.

A.

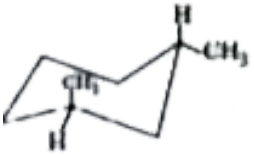


B.



C.

D.



Answer: A::B::D

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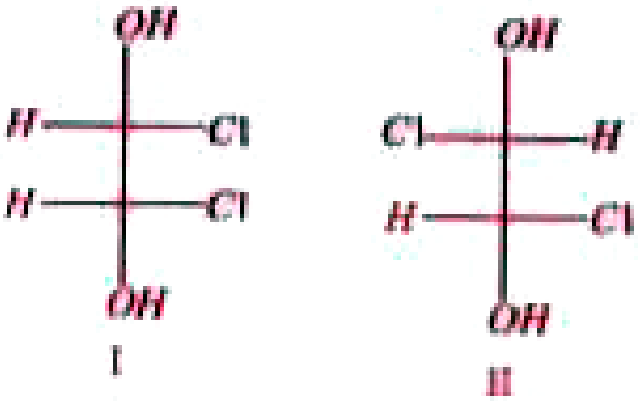
12. Which of the following statements regarding the Fischer projection formulae given here is right



A. I & II are constitutional isomers

B. I and II are stereoisomers

C. I and II are diastereoisomers

D. Both have same IUPAC name

Answer: B::C::D

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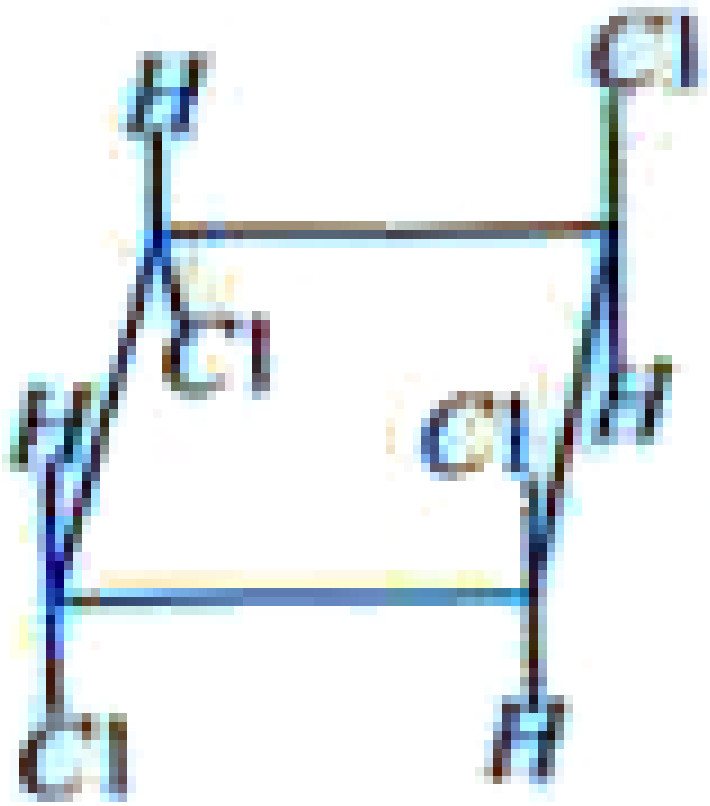

13. is optically inactive due to the presence of

A. centre of symmetry

B. plane of symmetry

C. axis of symmetry

D. none of the above

Answer: A::B

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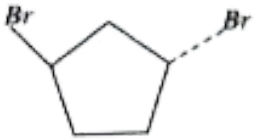
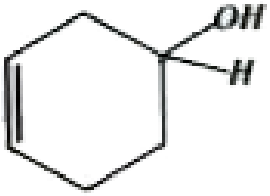
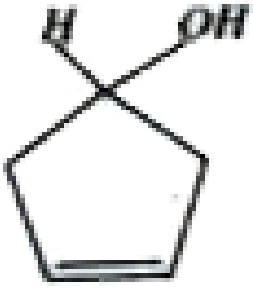
14. Which of the following molecules is achiral?



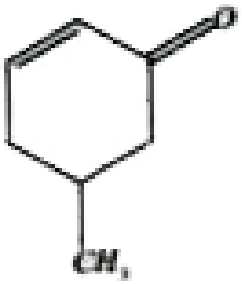
A.



B.



C.



D.

Answer: B::C::D

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ADDITIONAL PRACTICE EXERCISE (PRACTICE SHEET (ADVANCED) LINKED COMPREHENSION TYPE QUESTIONS)

1. Constitutional isomerism is also known as structural isomerism. The isomers which differ in the connectivity of their atoms are called constitutional isomers.

Which pair is correctly matched?

A. n-butane and isobutane, metamers

B. 2-pentanol and 3-pentanol, position isomers

C. Cyclohexene and cyclopentene, chain isomers.

D. methyl propyl ether and diethyl ether, functional isomers

Answer: B

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2. Constitutional isomerism is also known as structural isomerism. The isomers which differ in the connectivity of their atoms are called constitutional isomers.

Which pair is correctly matched?

A. acetoxime

B. cyclohexanol

C. cyclohexanone

D. hexanol

Answer: C

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3. Geometrical Isomerism Molecules having same molecular formula but differing in the orientation of atoms in a space due to resistricted rotation.

Compound which do not exhibit geometric isomerism

A. ether

B. 2-butene

C. 3, 4 dimethyl-3-haxcne

D. 2-chloru - 3-methyl - 2-pentene

Answer: A

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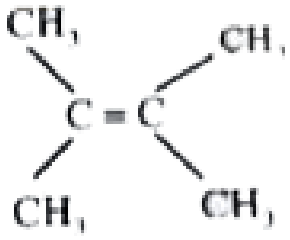
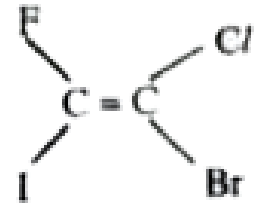
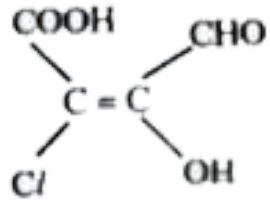
4. Geometrical Isomerism Molecules having same molecular formula but differing in the orientation of atoms in a space due to resistricted

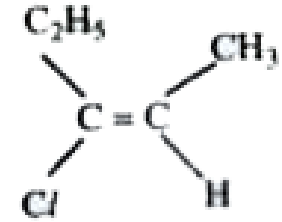
rotation.

Compound which do not exhibit geometric isomerism

A. 

B. 

C. 

D. 

Answer: D

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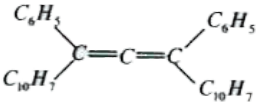
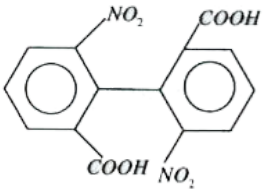
5. Presence of chiral carbon in organic compound is neither a necessary not a sufficient condition for showing optical activity. The chirality, i.e., dissmmetry of a molecule as a whole is the necessary condition for optical activity.

Which of these compounds will NOT show optical activity?

A. $CH_3 - CHCOH - CH_2 - CH_3$

B. 

C. 

D. 

Answer: D

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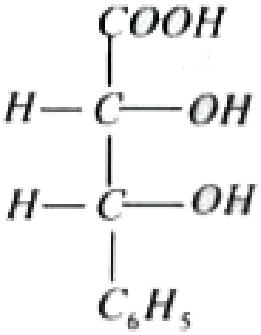
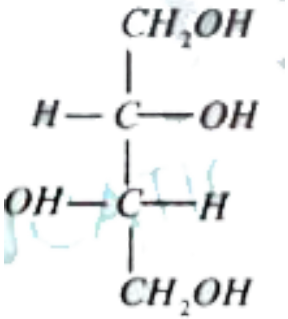
6. Presence of chiral carbon in organic compound is neither a necessary not a sufficient condition for showing optical activity. The chirality, i.e., dissmmetry of a molecule as a whole is the necessary condition for optical activity.

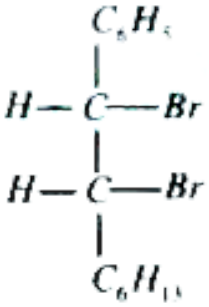
Which one of the following is achiral molecule?



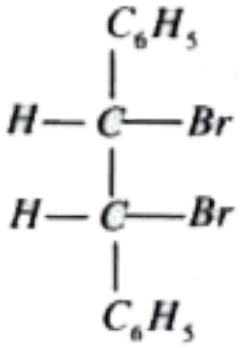
A.



B.



C.



D.

Answer: D

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7. An organic compound having a carbon attached to four different groups is optically active. But is it that opposite is also true? That is, do all optically active organic compounds have chiral carbons? Not necessarily. Presence or absence of chiral centre is not the sufficient

criteria for optical activity. The ultimate criteria is presence or absence of either plane or centre of symmetry. Two compounds which are non superimposable mirror images of each other are called enantiomers. If a compound contains more than one chiral carbon, new words are required to describe the relationship between various stereisomers of the compound. Those words are diastereomers and mesomers.

Optically active compounds among the following is

A. $CH_3CH_2\underset{\underset{Cl}{|}}{C}HCH_2CH_3$

B. $CH_3CH_2\underset{\underset{Cl}{|}}{C}DCH_2CH_2$

C. $CH_3CH_2CHDCH_2CH_3$

D. $CH_3CH_2CHDCH_3$

Answer: D

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8. An organic compound having a carbon attached to four different groups is optically active. But is it that opposite is also true? That is, do

all optically active organic compounds have chiral carbons? Not necessarily. Presence or absence of chiral centre is not the sufficient criteria for optical activity. The ultimate criteria is presence or absence of either plane or centre of symmetry. Two compounds which are non superimposable mirror images of each other are called enantiomers. If a compound contains more than one chiral carbon, new words are required to describe the relationship between various stereisomers of the compound. Those words are diastereomers and mesomers.

Optically active compounds among the following is

A. I and II

B. II and III

C. I and III

D. IV and V

Answer: C

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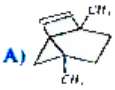
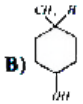
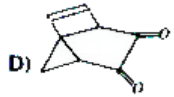
ADDITIONAL PRACTICE EXERCISE (PRACTICE SHEET (ADVANCED) MATRIX MATCHING TYPE QUESTIONS)

1.

Column-I	Column-II
A) 	P) contains no chiral centre(s)
B) 	Q) optically inactive
C) 	R) contains two chiral centres
D) 	S) Meso compound

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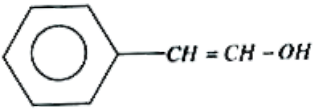
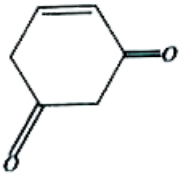
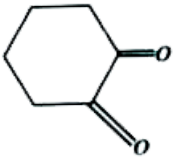
ADDITIONAL PRACTICE EXERCISE (PRACTICE SHEET (ADVANCED) INTEGER TYPE QUESTIONS)

1. Tautomerism is exhibited by X number of compounds among the following. What is X.

a) 

b) 

c) 

d) 

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2. The number of esters possible for the molecular formula $C_5H_{10}O_2$ is

____

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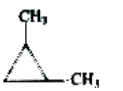
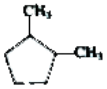
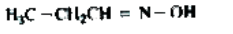
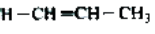
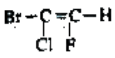
3. You are provided with a set of compounds. What is the number of compounds that are expected to show geometrical isomerism.

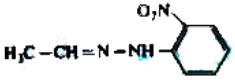












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4. Total number of stereoisomers of the following compound is

$CHCl = CH - CH(CH_3)C_2H_5$

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5. $CH_3 - CH = CH - \underset{OH}{CH} - \underset{OH}{CH} - CH_3$ number of streoisomers are

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6. The number of isomeric compounds having a benzene ring and molecular formula C_7H_9N are____

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7. How many structural isomers are possible with C_7H_8O?

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8. $CH_3 - CH = C = C = CH_2$ How many geometrical isomers of this triene are possible____

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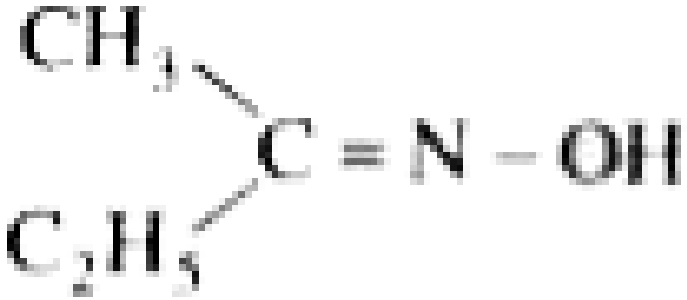

9.

number of geometrical isomers possible for this oxime is

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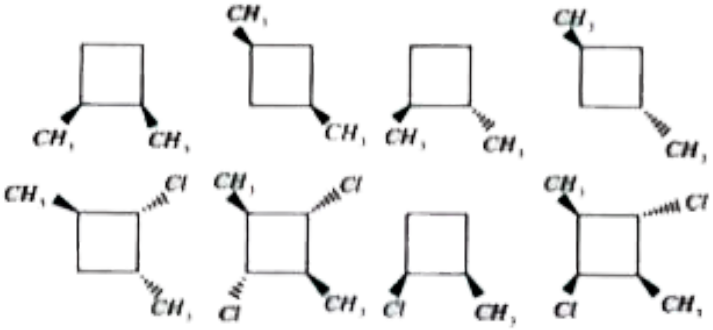
10. No. of chiral molecules from the below given compounds are



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