

CHEMISTRY

BOOKS - MODERN PUBLICATION CHEMISTRY (KANNADA ENGLISH)

ISOMERISM IN ORGANIC COMPOUNDS

Mcq Level I Structural Isomerism And Conformations

1. Which of the following is an isomer of $CH_3CH_2CH_2CH_2OH$?

A. $CH_3CH_2CH_2OH$

B. $CH_3CH_2OCH_3$

C. $CH_3CHCH_2CH_3$ $|_{OH}$ D. $CH_3CH_2COCH_3$

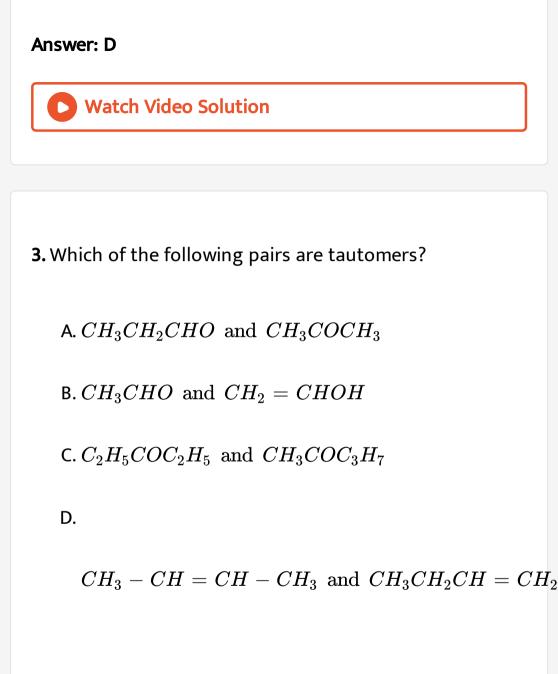
Answer: C



2. The functional isomer of $CH_3CH_2CH_2OH$ is :

 $\mathsf{C}.\,CH_3-O-CH_3$

D. $CH_3 - O - CH_2CH_3$



Answer: B



4. Which of the following is not isomer of $C_5H_{10}O$?

A. 3- Pentanone

B. 2- Pentanone

C. Pentanal

D. 3- Ethoxy propane

Answer: D

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5. How many chain isomers are possible for the alkane

 $C_{6}H_{14}$?

A. six

B. five

C. four

D. nine

Answer: B

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6. The isomers whose structures differ markedly in arrangment of atoms, but which exist in equilibrium are called :

A. Metamers

B. Enantiomers

C. Tautomers

D. Mesomers

Answer: C



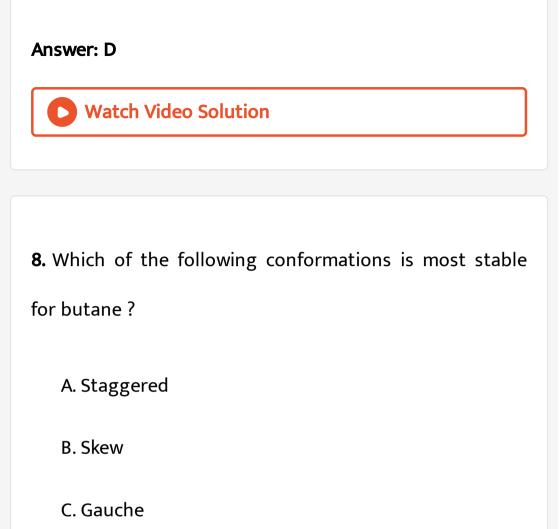
7. Which of the following is not metamer?

A. $C_2H_5OC_2H_5$

 $\mathsf{B.} CH_3O(CH_2)_2CH_3$

C. $CH_3OCH(CH_3)_2$

D. $CH_3OC(CH_3)_3$



D. Eclipsed

Answer: A



9. An isomer of ethanol is :

A. Methanol

B. Diethyl ether

C. Acetone

D. Dimethyl ether

Answer: D

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10. A hydrocarbon has the molar mass 86. The number of

chain isomers possible for the compound is :

A. Five

B. Six

C. Four

D. Ten

Answer: A

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11. The total number of structural isomers for the compound having molecular formula C_3H_5Cl is :

A. Four

B. Five

C. Six

D. One only

Answer: B

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12. The number of monobromo derivatives of neopentane

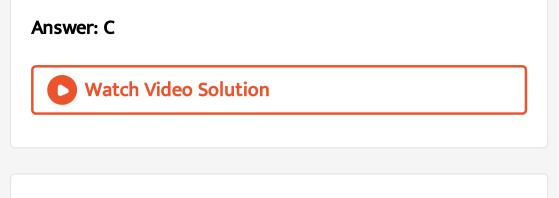
is :

A. Five

B. Four

C. One

D. More than five



13. Write all possible isomers with the molecular formula $C_4 H_{10} O$ and name them.

A. Four

B. six

C. seven

D. eight

Answer: C



The

compounds

 CH_3COCH_3 and $CH_2 = CH(OH)CH_3$ represent :

A. functional isomerism

B. position isomerism

C. metamerism

D. keto-enol tautomerism

Answer: D

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15. HCN and HNC are :

A. Metamers

B. Functional

C. Position isomers

D. Chain isomers

Answer: B

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16. n-Butyl alcohol and isobutyl alcohol are :

A. Chain isomers

B. position isomers

C. Metamers

D. Tautomers

Answer: A



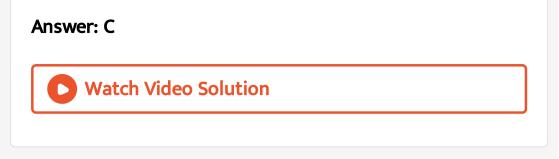
17. The number of structural isomers (open and cyclic) possible for an organic compound having molecular formula C_5H_{12} is :

A. 2

B. 4

C. 3

D. 5



18. Which of the following will have least hindered rotation about carbon-carbon bond ?

A. Ethane

B. Ethene

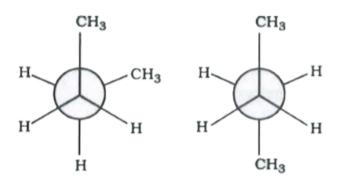
C. Acetylene

D. Hexachloroethane

Answer: A



19. The pair of structures given below represents :



A. Enatiomers

B. Diastereomers

C. Conformations

D. Stereoisomers

Answer: C



20. The isomers which can be converted into one another

by free rotation about carbon-carbon bond are called :

A. Conformations

B. Optical isomers

C. Stereoisomers

D. Diastereomers

Answer: A



21. The isomerism which exists between CH_2ClCH_2Cl and CH_3CHCl_2 is :

- A. Position isomerism
- B. Functional isomerism
- C. metamerism
- D. Chain isomerism

Answer: A

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22. How many isomers of $C_5H_{11}OH$ will be primary alcohol?

A. 2

B. 3

C. 4

D. 5

Answer: C

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23. The most stable conformation of n-butane is :

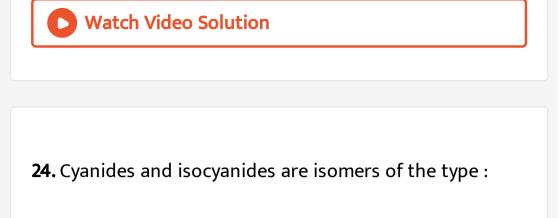
A. Skew-boat

B. Eclipsed

C. Gauche

D. Staggered anti

Answer: D



- A. Position isomerism
- B. Tautomers
- C. Functional isomers
- D. Metamers.

Answer: C



25. A dihedral angle HCH in staggered conformation of C_2H_6 is :

A. $120^{\,\circ}$

B. 60°

 C. 0°

D. 90°

Answer: B



Mcq Level I Geometrical Isomerism

1. Which of the following compounds can exist in the two

geometerical isomeric forms ?

A.
$$CH_3-C\equiv C-CH_3$$

 $\mathsf{B.}\, CH_3CH_2CH=CH_2$

$$\mathsf{C.}\,CH_3- egin{array}{cc} C &= & C & - & CH_3 \ & & ec{} & ec{}$$

 $\mathsf{D}.\,CH_3CH_2CH=CHCH_3$

Answer: D



2. Which among the following exhibit geometrical

isomerism?

A. 1, 1-Dichloroethene

B. 2-Butene

C. 1-Butene

D. 2-Methyl-2-butene

Answer: B

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3. Which of the following compounds exhibit cis and trans

forms?

A. 2- Butyne

B. 2- Butene

C. 2- Butanol

D. 1- Butanol

Answer: B

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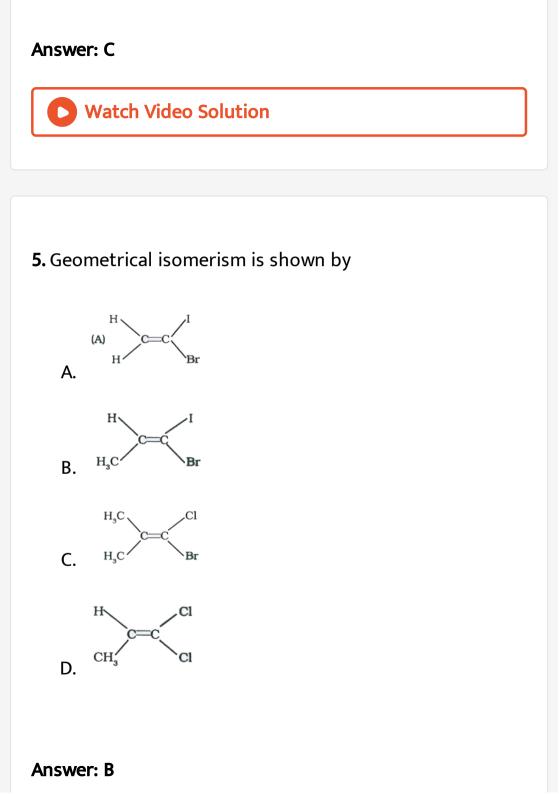
4. Of the following compounds, which will have zero dipole moment ?

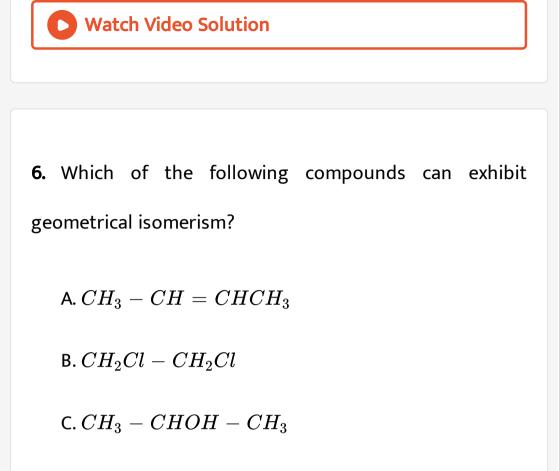
A. 1, 1-Dichloroethylene

B. cis-1, 2-Dichloroethylene

C. trans-1, 2-Dichloroethylene

D. None of these compounds





D. $CH_3CH_2 - C \equiv CH$

Answer: A

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7. Which of the following can exhibit cis-trans isomerism?

A.
$$CH_3 - CH(Cl)COOH$$

$$\mathsf{B}.\,H-C\equiv C-Cl$$

 $\mathsf{C.}\, ClCH = CHCl$

 $\mathsf{D.} \ ClCH_2 - CH_2 - Cl$

Answer: C

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8. Which of the following compounds will show geometrical isomerism?

A. Cyclohexene

B. 2-hexene

C. 3-hexyne

D. 1, 1-diphenylethylene

Answer: B

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Mcq Level I Optical Activity And Optical Isomerism

1. Substances which rotate the plane polarised light are called :

A. Optically active

B. Geometrical isomers

C. Tautomers

D. Mirror images

Answer: A

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2. Which out of the following is chiral in nature?

A. $CH_3CH(OH)CH_3$

B. $CH_3CH(OH)C_2H_5$

 $\mathsf{C.}\, CH_3 CH_2 OH$

$\mathsf{D.}\, CH_3 CH(OCH_3) CH_3$

Answer: B



3. Which of the following can exhibit optical isomerism?

A. 1, 1-Dichloropropane

B. 2, 2-Dichloropropane

C. 1, 3-Dibromopropane

D. 1, 2-Dichloropropane

Answer: D



4. Which of the following compounds is optically active ?

A. $(CH_3)_2 CHCH_2 CH_3$

B. $CH_3CH = CHCH_3$

 $\mathsf{C.} \begin{array}{c} CH_3CH_2CH_2CH_2CH_3\\ |\\ CH_3 \end{array}$

D. $(CH_3)_4C$.

Answer: C



5. Which of the following properties are not correct for

enantiomers?

A. They have identical physical properties except for

the direction of rotation of the plane polarised light

B. They have identical biological properties

C. They have identical chemical properties but react

differently towards other optically active

substances

D. Equal mixture of d- and l-enantiomers is called

racemic mixture.

Answer: B

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6. Isomers whose molecular structures are nonsuperimposable mirror images of each other are called :

A. diastereomers

B. mesomers

C. enantiomers

D. metamers

Answer: C



7. The essential and sufficient condition for enantiomers

to exist is :

A. the presence of double bond in the molecule

B. the dissymmetry in the molecule

C. the presence of asymmetric carbon atom

D. the tendency to form mirror image

Answer: B

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8. The number of asymmetric carbon atoms in tartaric acid is:

A. one

B. two

C. four

D. zero

Answer: B

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9. The number of optically active isomers of the compound C_7H_{16} are :

A. two

B. four

C. five

D. six

Answer: A
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10. Optical isomerism is shown by :
A. Butanol-1
B. Butanol-2
C. Butene-1
D. Dutana 2
D. Butene-2
Answer: B
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11. The conversion of d-form of an optically active compound into l-form of the same or of different compound or vice versa is known as :

A. Resolution

B. Walden inversion

C. Racemisation

D. External compensation

Answer: B



12. An example of an alkane molecule with least number

of carbon atoms which is optically active is :

- A. 2-Methylpentane
- B. 3-Methylpentane
- C. 3-Methylhexane
- D. 3-Methylheptane

Answer: C

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13. Which of the following has a plane of symmetry?

A. 2-Methylbutane

- B. Propanoic acid
- C. 2-Aminobutane

D. 3-Methylhexane

Answer: B



14. Which of the following forms of tartaric acid is optically active?

A. m-tartaric acid

B. γ -tartaric acid

C. d-tartaric acid

D. dl-tartaric acid

Answer: C



15. Chiral molecules are those which :

A. are not superimposable on their mirror images

B. are superimposable on their mirror images

C. undergo internal compensation of their optical

activity :

D. show geometrical isomerism

Answer: A

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16. Which of the following compounds cannot exhibit optical isomerism?

A. HOOCCH(OH)CH(OH)COOH

 $\mathsf{B.}\, CH_3 CH(OH) COOH$

C. $CH_2(COOH)CH(CH_3)C_2H_5$

 $\mathsf{D}.\,CH_3-CH=CH_2$

Answer: D

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17. The method of preparing an optically active compound

from symmetric molecules under the influence of some

optically active substance is called :

A. Resolution

B. Asymmetric synthesis

C. Optical inversion

D. Biochemical separation

Answer: B

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18. A molecule is said to be chiral if it :

A. exists as cis and trans isomers

B. contains a plane of symmetry

C. cannot be superimposed on its mirror image

D. contains a centre of symmetry.

Answer: C

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19. How many chain isomers are possible for the alkane C_6H_{14} ?

A. Six

B. Five

C. Three

D. Zero



20. Which of the following molecules does not have a chiral carbon atom?

A. 2, 2-Dimethyl-1-3-bromohexane

B. Neopentyl chloride

C. 2- Chlorobutane

D. Pentan-2-ol

Answer: B



21. How many asymmetric carbon atoms are present in 1,

2- dichlorocyclobutane?

A. One

B. Two

C. Three

D. Four

Answer: B



22. The compound which exhibits optical isomerism is :

A. $CH_3CHOH - CH_3$

CH₃ CH CH₂ CH₃ Β. CH,

 $\mathsf{C.}\,CH_3-CHCl-CH_2CH_3$

 $\mathsf{D.}\,CH_3-CCl_2-CH_2CH_3$

Answer: D

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23. Mesotartaric acid is optically inactive. This is because

of :

A. absence of chirality

B. racemisation of d and l optical forms

- C. external compensation
- D. internal compensation

Answer: D

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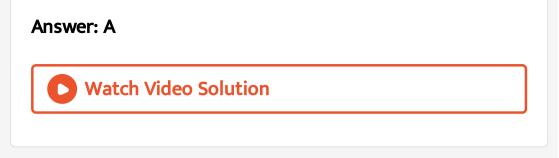
24. A compound having n dissimilar asymmetric carbon atoms can exist in stereoisomers equal to :

A. 2^n

 $\mathsf{B.}\,2n^2$

C. $2\sqrt{n}$

D. 2^{n+1}



25. The property by virtue of which a compound can rotate the plane of polarised light is :

A. Photolysis

B. Racemisation

C. Optical activity

D. Phosphorescence

Answer: C



26. The process of separation of racemic mixture into d

andl enantiomers is called :

A. Dchydration

B. Resolution

C. Racemisation

D. Condensation

Answer: B



27. The essential condition for a molecule to exhibit optical isomerism is that the molecule should have :

A. a C = C double bond

B. asymmetric carbon atom

C. a linear structure

D. dissymmetry

Answer: D

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28. The number of chiral carbon atoms in the compound

 $CH_3CHCOCH_3 \ ert \ CH_2CH_3$

A. One

B. Two

C. Three

D. None

Answer: A

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29. A mixture of equal parts of any pair of enantiomers is

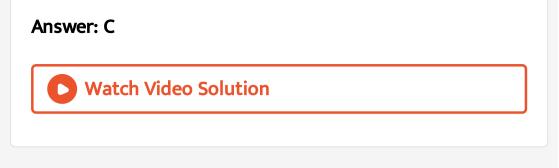
called :

A. diastereomers

B. mesomers

C. Racemic mixture

D. Conformational isomer



30. Which one of the following would be optically active?

A. Succinic acid

B. Lactiv acid

C. Meso tartaric acid

D. Chloroacetic acid

Answer: B



31. Which can exist in optically active form?

A. 1-Butanol

B. 2-Butanol

C. 3-Pentanol

D. 4-Heptanol

Answer: B



32. The maximum number of stereo isomers possible for

2-hydroxy - 2-methyl butanoic acid is :

B. 2

C. 3

D. 4

Answer: D



33. An example of a molecule which is chiral but does not

contain chiral carbon atom is :

A. $CH_3CH(OH)COOH$

B. meso-tartaric acid

C. 2, 3-Pentadiene

$\mathsf{D}.\,(CH_3)_2CHCH(Cl)CH_3$

Answer: C

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34. How many structural isomers of C_6H_{14} can exhibit enantiomerism?

A. One

B. Two

C. Three

D. None

Answer: D



35. Optical activity is measured by :

A. Refractometer

B. Spectrograph

C. Polarimeter

D. Tracer technique

Answer: C



36. The number of optical isomers of the compound $CH_3CHBrCOOH$ is :

A. 0

B. 1

C. 3

D. 4

Answer: D



37. Which of the following compounds can exist in optically active form?

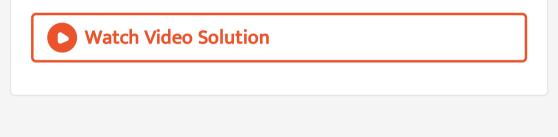
A. but-1-ene

B. butan-2-ol

C. pentan-3-ol

D. heptan-4-ol

Answer: B





1. Which of the following is not an isomer of 1-Butyne?

A. But-2-yne

B. Buta-1, 3- diene

C. But-2-ene

D. Methylcyclo propene

Answer: C



2. The meso tartaric acid may be represented as :

$$COOH$$

$$|$$

$$HO - C - H$$
A.
$$|$$

$$H - C - OH$$

$$|$$

$$COOH$$

COOH

$$H - C - OH$$

 $H - C - OH$
 $H - C - H$
 $COOH$
 $H - C - OH$
 $C.$
 $H - C - OH$
 $H - C - OH$
 $COOH$
 $COOH$
 $COOH$
 $H - C - OH$
 $COOH$
 $COOH$
 $COOH$

Answer: C

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3. The molecules :

and

$$CH_3- \mathop{C}\limits_{egin{array}{c} | \ OH \end{array}} = CH - \mathop{C}\limits_{egin{array}{c} | \ O \end{array}} O - C_2H_5$$
 are :

- A. geometrical isomers
- **B.** Tautomers

C. diastereomers

D. metamers

Answer: B

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4. Keto-enol tautomerism is observed in :

Answer: B



5. Maleic acid and fumaric acid are the forms of :

A. Chain isomers

B. Geometrical isomers

C. Optical isomers

D. Functional isomers

Answer: B

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6. Only two isomeric monochloro derivatives are possible

for :

A. 2- methylpropane

B. n-butane

C. benzene

D. 2, 4-dimethylpentane

Answer: A

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7. The total number of isomers for the compound of the

formula $C_4 H_{10} O$ is :

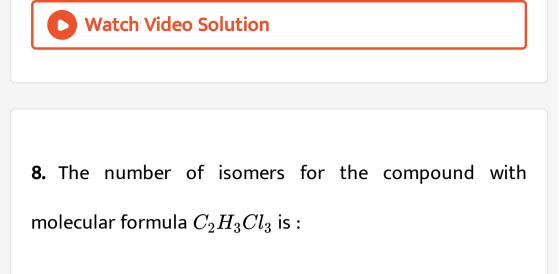
A. Seven

B. Six

C. Three

D. Four

Answer: A



A. Two

B. Three

C. Four

D. Five

Answer: A



9. The hydrocarbon containing continuous chain which is

isomeric with 2-methyl-3 ethylhexane is :

A. Hexane

B. Octane

C. Nonane

D. Decane

Answer: C



10. Which of the following compounds can exist as geometrical isomers?

A. $CH_2Cl - CH_2Br$

 $\mathsf{B.}\,CH_2=CHCl$

 $\mathsf{C.}\, CHBr = CHCl$

D. $CH_2Cl - CH_2Cl$

Answer: C

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11. The compound $C_4H_{10}O$ can show :

A. metamerism

B. functional isomerism

C. positional isomerism

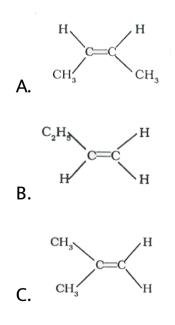
D. all types

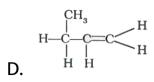
Answer: D



12. Which of the following alkenes with molecular formula

 C_4H_8 exhibits geometrical isomerism?





Answer: A

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13. Which of the following pairs shows isomerism?

A. CH_2Cl_2 and $CHCl_3$

B. CH_3OCH_3 and C_2H_5OH

C. C_6H_6 and C_3H_8

D. C_2H_4 and C_3H_6

Answer: B



14. Which of the following pairs does not represent a pair

of isomers?

A.
$$CH_3CH_2OCH_2CH_2CH_3$$

 $CH_3CHOCH_2CH_3 \ ert \ CH_3 \ CH_3$

B. CH_3CH_2COOH and CH_3COOCH_3

C. $CH_3CH_2NO_2$ and NH_2CH_2COOH

and

$${\sf D}.\, C_6H_5 \mathop{C}\limits_{||}{C} - \mathop{C}\limits_{||}{C} - \mathop{C}\limits_{|H_3}{C} - C_6H_5 \ {}_{O} {}_{CH_3} \ {}_{CH_3} \ {}_{CH_3} \ {}_{CH_3} - \mathop{C}\limits_{||}{C} - \mathop{C}\limits_{|H_5}{C} - C_6H_5 \ {}_{O} \ {}_{C} H_5 \ {}_{O} \ {}_{O} \ {}_{O} \ {}_{C} H_5 \ {}_{O} \ {}_{O} \ {}_{O} \ {}_{C} H_5 \ {}_{O} \ {}_{O} \ {}_{O} \ {}_{C} H_5 \ {}_{O} \ {}_{O} \ {}_{O} \ {}_{C} H_5 \ {}_{O} \ {}_$$

Answer: D



15. The phenomenon of metamerism is shown by :

A. vinyl alcohol and acetaldehyde

B. ethyl alcohol, and dimethyl ether

C. methyl-n-propyl ketone and dimethyl ketone

D. acetic acid and propionic acid

Answer: C

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16. Which of the following statements is not correct?

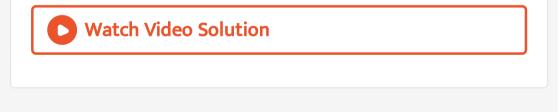
A. Alkynes do not show geometrical isomerism

B. Propane shows conformational isomerism

C. Chain isomerism is shown by all alkanes

D. Meso tartaric acid is optically inactive

Answer: C



17. Which one of the following shows functional isomerism?

A.
$$CH_2 = CH - CH_2 - CH_3$$

 $\mathsf{B}.\,CH_3-CH=CH-CH_3$

C. $CH_3 - C \equiv C - CH_3$

 $\mathsf{D}_{\cdot} (CH_3)_2 C = CH - CH_2 - CH_3$

Answer: B

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18. Which of the following is/are isomers of methyl propanoate?

A. Butanoic acid

B. Ethyl ethanoate

C. Butane-1, 2-diol

D. Both (A) and (B)

Answer: D



19. How many isomers are possible for the compound with molecular formula C_4H_8 ?

A. Four

B. Six

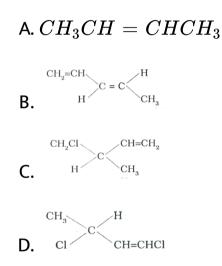
C. Seven

D. Eight

Answer: B



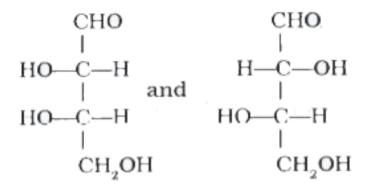
20. Which of the following will not show geometrical isomerism?



Answer: C



21. The following pair of molecules represents :



- A. Diastereomers
- B. Racemic mixture
- C. enantiomers
- D. Meso isomers

Answer: A

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22. The type of isomerism shown by :

 $CH_3CH(OH)COOH$ is :

A. Position isomerism

B. Functional isomerism

C. Optical isomerism

D. cis-trans isomerism

Answer: C



23. How many isomeric compounds will be obtained when a disubstituted derivative of benzene is prepared from its monosubstituted derivative? A. 3

B. 4

C. 5

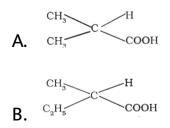
D. 6

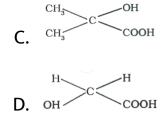
Answer: A

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24. Which of the following compounds can exist as optical

isomers?





Answer: B



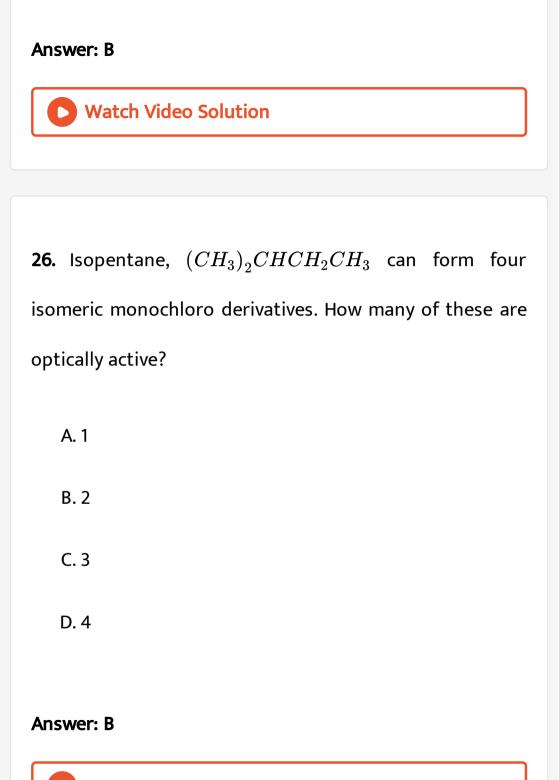
25. Dichloroethylene does not show :

A. Geometrical isomerism

B. Optical isomerism

C. Both

D. None







27. Which of the following has zero dipole moment?

A. cis-2-butene

B. trans-2-butene

C. 1-Butene

D. 2-methyl-1-propene

Answer: B



28. The enolic form of acetone contains :

A. 9σ bonds, 1π bond and 2 lone pairs

B. 8σ bonds, 2π bonds and 2 lone pairs

C. 10σ bonds, 1π bond and 1 lone pair

D. 9σ bonds, 2π bonds and 1 lone pair

Answer: A

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29. Which of the following compounds will show geometrical isomerism?

A. 2-Butene

B. Propene

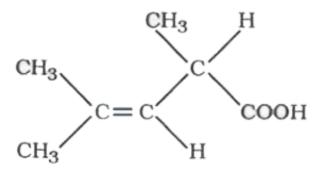
C. 1-Phenylpropene

D. 2-Methyl-2-butene

Answer: A



30. The compound



can exhibit :

A. Geometrical isomerism

B. tautomerism

C. Optical isomerism

D. geometrical and optical isomerism

Answer: C

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31. In which of the following pairs, the first one is chiral

and the second one is achiral?

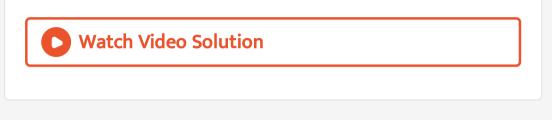
A. lactic acid, ethanol

B. lactic acid, butan-2-ol

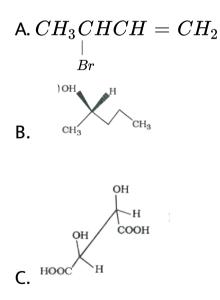
C. 2-Methylbutanal, 3-methylhexane

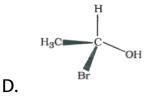
D. 2, 3-Dimethyl butane, 2,3-Dimethyl pentane

Answer: A



32. Which of the following molecules is achiral?



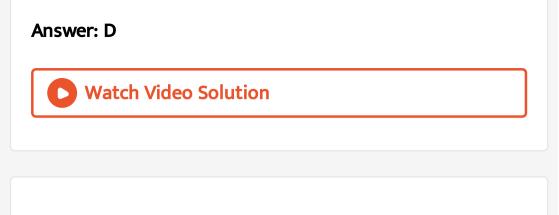


Answer: C

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33. Which isomer of hexane has only two different sets of structurally equivalent hydrogen atoms?

- A. 2, 2-dimethylbutane
- B. 2-Methylpentane
- C. 3-Methylpentane
- D. 2, 3-dimethylbutane



34. Which of the following compounds will exhibit cistrans isomerism?

A. Butanol

B. 2-Butenol

C. 2-Butyne

D. Toluene

Answer: C



35. Which of the following compounds will 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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36. Which of the following compounds exhibits stereoisomerism?

- A. 2-Methyl-1-butene
- B. 3-Methyl-1-butyne
- C. 3-Methylbutanoic acid
- D. 2-Methylbutanoic acid

Answer: D

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37. A similarity between optical and geometrical isomerism is that :

A. each form 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 stereoisomerism

D. they have no similarity

Answer: C

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38. Which of the following 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



39. Of the five isomeric hexanes, the isomer which can give two monochlorinated compound is :

A. n-hexane

- B. 2, 3-dimethyl butane
- C. 2, 2-dimethyl butane
- D. 2-methyl pentane

Answer: B



40. The number of structural isomers for C_6H_{14} is :

A. 3

B.4

C. 5

D. 6

Answer: C



Mcq Level Iii

1. The alkene that exhibits geometrical isomerism is :

A. Propene

B. 2-Methylpropene

C. 2-Butene

D. 2-Methyl-2-butene

Answer: C



2. The number of stereoisomers possible for $CH_3 - CH = CH - CH(OH) - Me$ is :

A. 3

B. 2

C. 4

D. 6

Answer: C

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3. Identify the compound that exhibits tautomerism :

A. 2-Pentanone

B. Phenol

C. 2-Butene

D. Lactic acid

Answer: A



4. Which of the following compounds will exhibits geometrical isomerism?

A. 1-Phenyl-2-butene

B. 3-Phenyl-1-butene

C. 2-Phenyl-1-butene

D. 1, 1-Diphenyl-1-propane

Answer: A



Recent Examination Questions

1. Which of the following is most energetic conformation of cyclohexane?

A. Boat

B. Twisted Boat

C. Chair

D. Half Chair

Answer: A

