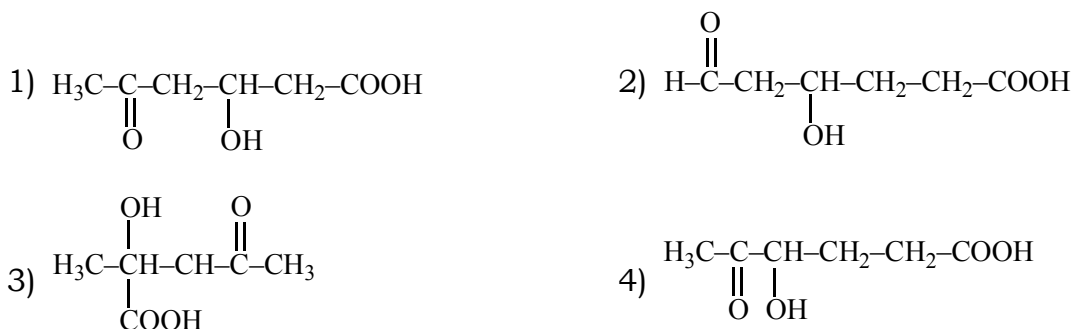


20.NOMENCLATURE WITH FUNCTIONAL GROUPS

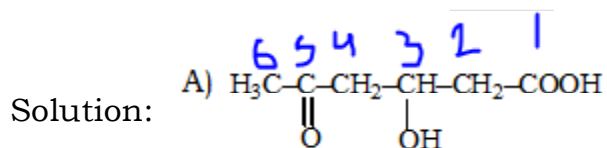
SOLUTIONS

JEE MAIN LEVEL QUESTIONS

1. The structure for 3-hydroxy-5-oxohexanoic acid is

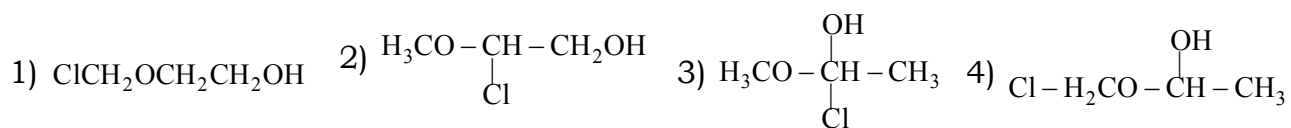


Answer:1

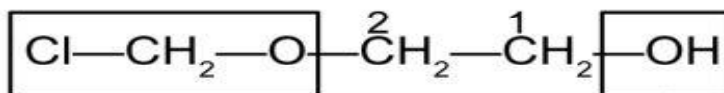
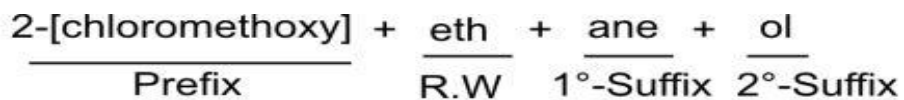


For option 1 ,at 3rd carbon have hydroxy and 5th carbon oxo

2. The structure of 2-chloromethoxyethanol



Answer:1



Solution:

2-[Chloromethoxy]

Prefix

Functional group :

Ol

3. The IUPAC name of the compound $\text{CH}_3-\text{CH}(\text{C}_2\text{H}_5)-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_3$ is

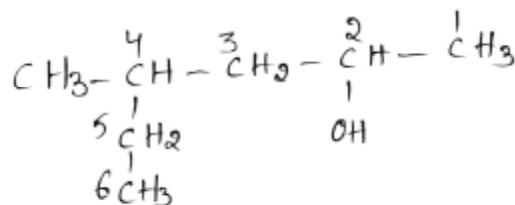
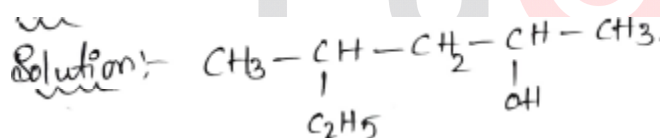
1) 4-Ethylpentanol-2

2) 4-Methylhexanol-2

3) 2-Ethylpentanol -2

4) 3-Methylhexanol-2

Answer:2



4-Methylhexanol-2

4. The IUPAC name of $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}(\text{CH}_3)_2$ is

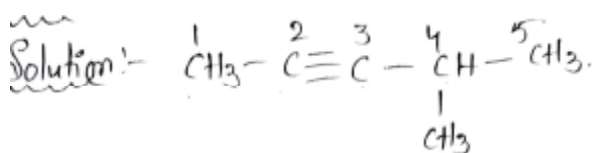
1) 4 - Methyl-2-pentyne

2) 4,4, -Dimethyl -2- butyne

3) Isopropylmethyl acetylene

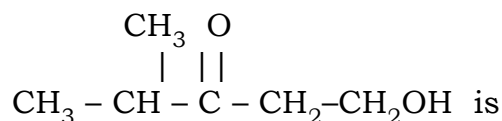
4) 2-Methyl-4-pentyne

Answer:1



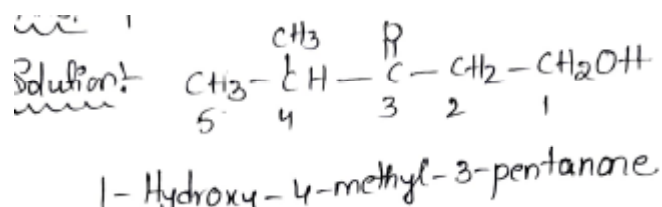
4-methyl-2-pentyne.

5. The IUPAC name of



- 1) 1-Hydroxy-4-methyl-3-pentanone 2) 2-Methyl -5-hydroxy-3-pentanone
3) 4-Methyl -3-oxo-1-pentanol 4) Hexanol-1-one-3

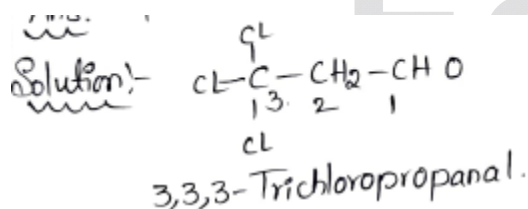
Answer:1



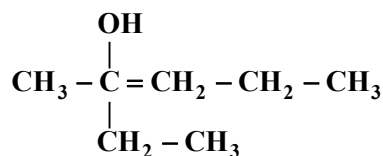
6. The correct IUPAC name of $\text{Cl}_3\text{C}-\text{CH}_2\text{CHO}$

- 1) 3,3,3-Trichloro propanal 2) 1,1,1-Trichloro propanal
3) 2,2,2-Trichloro propanal 4) Chloral

Answer:1

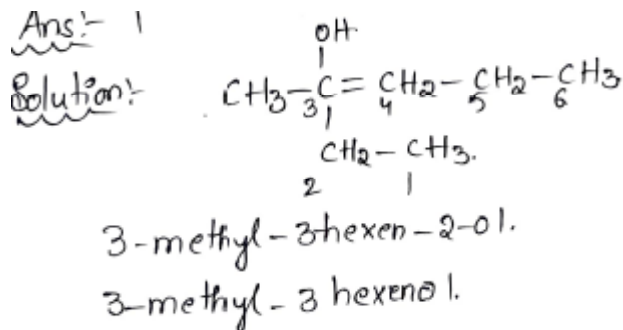


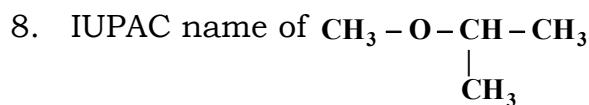
7. IUPAC name of



- 1) 3-methyl-3-hexanol 2) 2-ethyl-2-pentanol
3) 2-ethyl-2-hydroxy pentane 4) Any of these

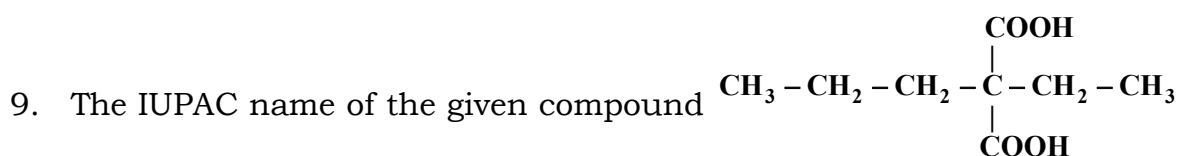
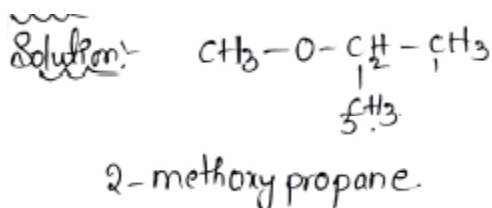
Answer:1





- 1) methyl propyl ether 2) methyl isopropyl ether
3) 2-methoxy propane 4) all the above

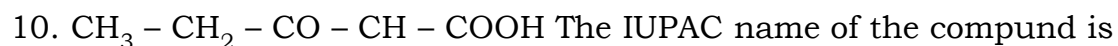
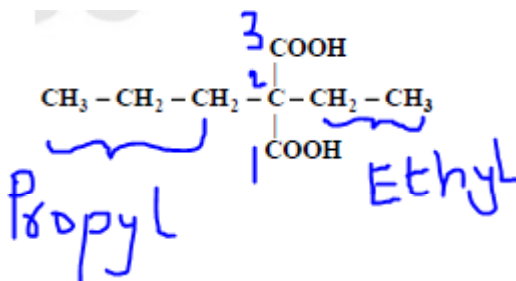
Answer:3



- 1) 2-Ethyl-2-propyl propanedioic acid 2) 2-Propyl-2-ethyl propanedioic acid
3) 2-Ethyl-2-carboxy pentanoic acid 4) 2-Carboxy-2-ethyl pentanoic acid

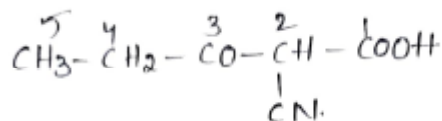
Answer:1

Solution:



- 1) 3 - Ketonic -2- cyano pentanoic acid 2) cyanoketohexanoic acid
3) 3 - oxo -2 - cyano pentanoic acid 4) 2 - cyano -3 -oxo pentanoic acid

Answer:4



Solution:

2-Cyano-3-oxopentanoic acid.

11. The correct IUPAC name of $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$ is
- 1) Acetyl methanoate
 - 2) Keto ethanoate
 - 3) Ethoxy methanoate
 - 4) Formyl ethanoate

Answer:4

Solution: $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$
Formyl Ethanoate

12. The IUPAC name of $\begin{array}{c} \text{C}_2\text{H}_5-\text{O} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{H}_3\text{C}-\text{CH} \\ | \\ \text{CH}_3 \end{array}$

- 1) Ethoxy methanone
- 2) Ethoxy propanone
- 3) Ethyl-2-methyl propanoate
- 4) 2-methyl ethoxy propanone

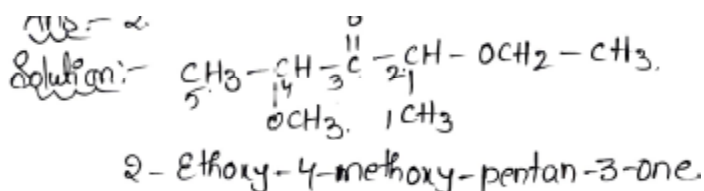
Answer:3

Solution:- $\begin{array}{c} \text{C}_2\text{H}_5-\text{O} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{H}_3\text{C}-\underset{\underset{1 \text{ CH}_3}{|}}{\underset{2}{\text{CH}}}-3 \end{array}$
Ethyl-2-methyl propanoate

13. IUPAC name of $\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{CH}-\text{C}-\text{CH}-\text{OCH}_2-\text{CH}_3 \\ | \quad | \\ \text{OCH}_3 \quad \text{CH}_3 \end{array}$

- 1) 2-Methoxy-4-ethoxy-3-pentanone
- 2) 2-Ethoxy-4-methoxy-3-pentanone
- 3) 2,4-Dimethoxy hexanone
- 4) 2-Ethoxy-3-methoxy-3-pentanone

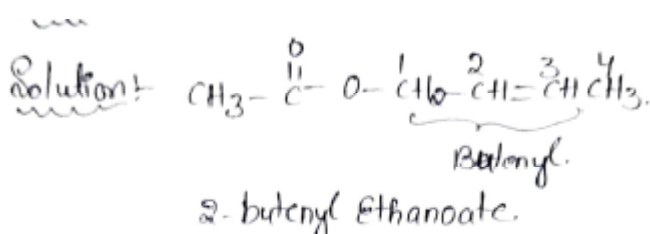
Answer:2



14. The IUPAC name of $\text{CH}_3 - \overset{\substack{\text{O} \\ ||}}{\text{C}} - \text{O} - \text{CH}_2 - \text{CH} = \text{CHCH}_3$

- | | |
|----------------------------|-------------------------|
| 1) 1- acetyloxy -2- butane | 2) 4-acetoxy 2-butane |
| 3) 2-butenylethanoate | 4) Methyl - 2-butanoate |

Answer:3

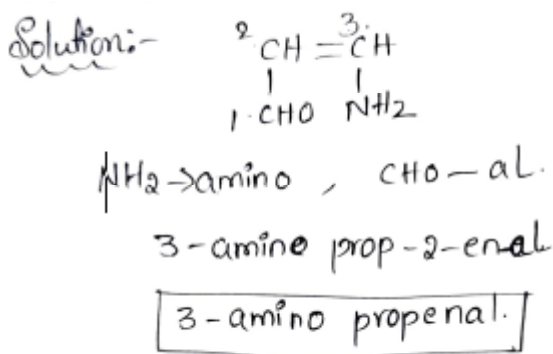


15. The IUPAC name of $\text{CH} = \text{CH}$ is

$$\begin{array}{c} \text{CHO} \quad \text{NH}_2 \end{array}$$

- | | |
|------------------------|----------------------------|
| 1) 1- amino-2-propenol | 2) 1- amino-2-formylethene |
| 3) 3-aminopropenal | 4) 1-oxo-3-propenamine |

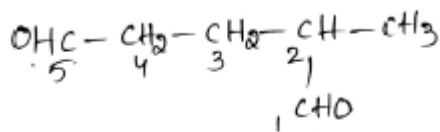
Answer:3



16. The IUPAC name of the compound $\text{OHC} - \text{CH}_2 - \text{CH}_2 - \underset{\substack{| \\ \text{CHO}}}{\text{CH}} - \text{CH}_3$ is :

- | | |
|-------------------------|--------------------------|
| 1) 2-Formyl pentanal | 2) 2-Methyl pentanedial |
| 3) 2,4 -Diformyl butane | 4) 1,3 - Diformyl butane |

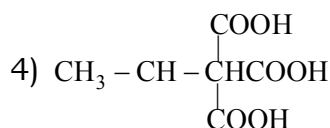
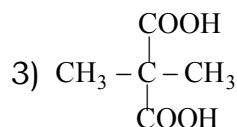
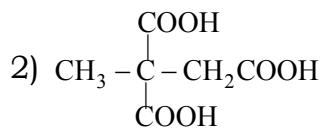
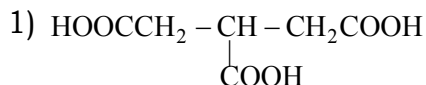
Answer:2



Solution:

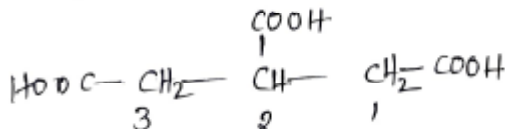
2-Methyl pentanedial.

17. The structure for propane-1,2,3- tricarboxylic acid is

**Answer:1**

Propane-1,2,3-tricarboxylic acid

Solution:

**JEE ADVANCED LEVEL QUESTIONS****Multicorrect Answer Type**18. The correct IUPAC name of the compound $\begin{array}{c} \text{CH}_2\text{-COOH} \\ | \\ \text{CH}_2\text{-COOH} \end{array}$ is

1) 1,4-Butane dioicacid

2) Ethane-1,2-dicarboxylic acid

3) Succinic acid

4) 1,2-Ethane dioic acid

Answer:1,3Solution:Structure = $\text{HOOC-CH}_2\text{-CH}_2\text{-COOH}$

1) 1,4-Butane dioic acid, 3) Succinic acid

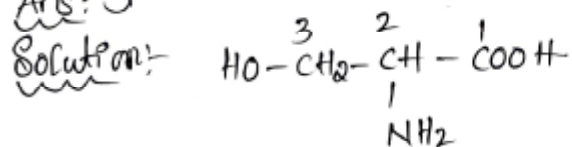
19. Correct statements about $\text{CH}_3\text{-CH}_2\text{-CN}$ is

1) IUPAC name of the compound propane-1-nitrile

2) secondary suffix of the compound is nitrile

- 3) 2-amino - 3-hydroxy - propanoic acid 4) 2-amino -3-hydroxybutanoic acid

Ans:- 3.



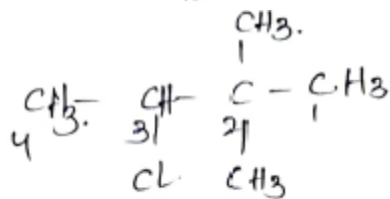
2-amino-3-hydroxy-propanoic acid.

22. The formula of 3-chloro -2, 2-dimethyl butane is

- 1) $\text{CH}_3.\text{CH}(\text{CH}_3)\text{C}(\text{CH}_3)_2\text{Cl}$ 2) $\text{CH}_3.(\text{CH}_2)_2\text{CH}_2\text{Cl}$
 3) $\text{CH}_3.\text{C}(\text{CH}_3)_2.\text{CH}_2\text{Cl}$ 4) $\text{CH}_3\text{CHClC}(\text{CH}_3)_3$

Ans:- 4.

Solution:- 3-chloro-2,2-dimethyl butane.



Educational Operating System

Matrix Matching Type

23. **LIST - 1**

(Structural formula)

- A) $\text{H}_2\text{C} = \text{CHCN}$
 B) $\text{H}_2\text{C} = \text{CH} - \text{CONH}_2$
 C) $\text{H}_2\text{C} = \text{CHCHO}$
 D) $\text{HC} \equiv \text{C} - \overset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{CH}_3$

LIST - 2

(Name of compound)

- 1) Propenamide
 2) But-1-yn-3-one
 3) Propenenitrile
 4) But-3-yn-2-one
 5) Propenal

Answer: A - 3, B - 1, C - 5, D - 4

Solution:

- A) $\text{H}_2\text{C} = \text{CHCN}$ 3) Propenenitrile
 B) $\text{H}_2\text{C} = \text{CH} - \text{CONH}_2$ 1) Propenamide
 C) $\text{H}_2\text{C} = \text{CHCHO}$ 5) Propenal
 D) $\text{HC} \equiv \text{C} - \overset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{CH}_3$ 4) But-3-yn-2-one

Conceptual Understanding Questions

1. In IUPAC nomenclature, the order followed for naming the compounds is :

- 1) Prefix(es) + root word + primary suffix + secondary suffix
- 2) Root word + prefix(es) + primary suffix + secondary suffix
- 3) Primary suffix + prefix(es) + root word + secondary suffix
- 4) Primary suffix + root word + prefix(es) + secondary suffix.

Answer:1

Solution:Correct sequence is:Prefix(es) + Root word + Primary suffix + Secondary suffix

2. A carbon compound has many functional groups, then order of preference while naming it according to IUPAC nomenclature is

- 1) $-\text{CHO} > -\text{COOH} > -\text{OH} > -\text{NH}_2$
- 2) $-\text{COOH} > -\text{CHO} > -\text{NH}_2 > -\text{OH}$
- 3) $-\text{COOH} > -\text{OH} > -\text{NH}_2 > -\text{CHO}$
- 4) $-\text{COOH} > -\text{CHO} > -\text{OH} > -\text{NH}_2$

Answer:4

Solution:Standard IUPAC priority among given options: $-\text{COOH} > -\text{CHO} > -\text{OH} > -\text{NH}_2$

3. The functional group present in acylchlorides is

- 1) $-\text{Cl}$
- 2) $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{Cl} \end{array}$
- 3) $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{OCl} \end{array}$
- 4) $-\text{CH}_2-\text{OCl}$

Answer:2

Solution:Acyl chloride group is $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{Cl} \end{array}$

4. Functional group present in amides is

- 1) $-\text{COOH}$
- 2) $-\text{NH}_2$
- 3) $-\text{CONH}_2$
- 4) $-\text{COO}-$

Answer:3

Solution:Amide group is $-\text{CONH}_2$

5. $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}- \end{array}$

- C - group is present in

- 1) ketones only 2) aldehydes only 3) Carboxylic acid only 4) All the above

Answer:4

Solution:- —C=O is Carbonyl group
 1) Ketone $\rightarrow \text{R-CO-R}$ $\Rightarrow$ Carboxylic acids $\rightarrow$
 2) Aldehyde $\rightarrow \text{R-CO-H}$ R-COOH .

6. Which of the following group is always represented by prefixes in the nomenclature

- 1) $-\text{NH}_2$ 2) $-\text{CN}$ 3) $-\text{CHO}$ 4) $-\text{NO}_2$

Answer:4

Solution: The $-\text{NO}_2$ (nitro) group is always written as a prefix

7. IUPAC name of $\text{CH}_3\text{CH}_2\text{CH}_2\text{COCH}_3$ is

- 1) 2- pentanone 2) Pentan-2-one 3) pentanone -2 4) all the above

Answer:4

Solution:- $\text{CH}_3-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\underset{\text{||}}{\text{C}}}-\text{CH}_3$
 2- Pentanone & Pentanone-2 &
 Pentan-2-one.

8. IUPAC name of $\text{HOOC}-\text{CH}_2-\text{CHO}$ is

- 1) Formyl ethanoic acid 2) 2-Carboxyethanal
 3) Prop-3-al-1-oic acid 4) Prop-1-al-3-oic acid

Answer:1

Solution: Carboxylic acid has higher priority than aldehyde

Root = propane

Aldehyde becomes formyl substituent

Formyl ethanoic acid

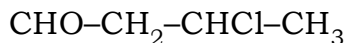
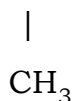
9. IUPAC name of $\text{CH}_3-\text{CHCl}-\text{CH}_2-\text{CHO}$ is

1) 2-chloro-4-butanol

2) 3-chlorobutanol

3) 2-chloro-4-butanal

4) 3-chlorobutanal

Answer:4Solution: Numbering from $-\text{CHO}$ carbon:Chloro at C-3 $\rightarrow$ 3-chlorobutanal10. IUPAC name of $\text{CH}_3 - \text{CH} - \text{CH}_2\text{OH}$ 

1) sec-butyl alcohol

2) pri-butyl alcohol

3) 2-methylpropanal

4) 2-methylpropanol-1

Answer:4

Solution: Longest chain = propane

 $-\text{OH}$ at C-1, methyl at C-2

2-methylpropan-1-ol

Edos

Educational Operating System

11. In IUPAC system of naming of organic compounds. Which of the following functional group has more preference than others (in a poly functional compound)

1) $-\text{OH}$ 2) $-\text{CHO}$ 3) $-\text{CO}-$ 4) $-\text{CONH}_2$ **Answer:4**Solution: Among given options, priority order: $-\text{CONH}_2$ (amide) $>$ $-\text{CHO}$ $>$ $-\text{CO}-$ $>$ $-\text{OH}$ **JEE MAIN LEVEL QUESTIONS**

12. The IUPAC name of

$$\begin{array}{c} \text{OH} \qquad \qquad \text{OH} \\ | \qquad \qquad | \\ \text{CH}_3 - \text{C} - \text{CH}_2 - \text{CH} - \text{CH}_3 \\ | \\ \text{CH}_2\text{CH}_3 \end{array}$$

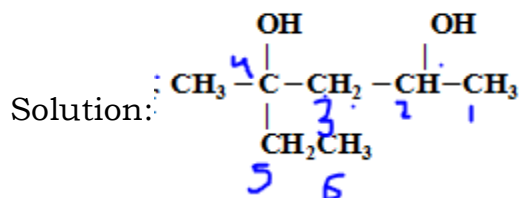
1) 1,1-dimethyl - 1, 3-butandiol

2) 2-methyl -2, 4-pentandiol

3) 4-methyl - 2, 4-hexanediol

4) 1, 2, 3 - trimethyl -1, 3-propanediol

Answer:3



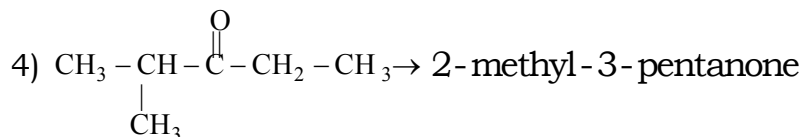
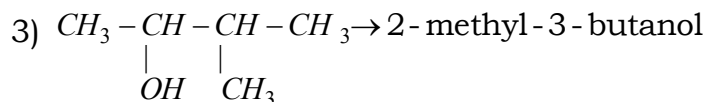
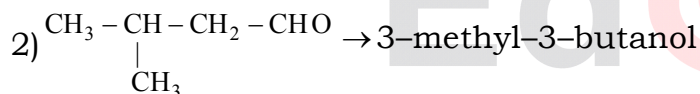
First find the longest continuous carbon chain that contains both -OH groups.

Choose the chain that runs from the ethyl end (left bottom) through the central C to the right end → a 6-carbon chain.

Numbering from the right (to give the OH substituents the lowest possible locants) places -OH groups at C-2 and C-4, and the extra methyl (the left-most CH₃) appears at C-4.

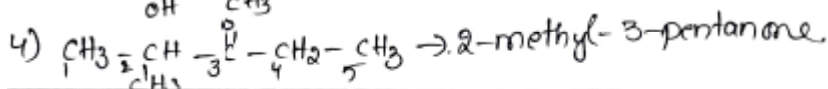
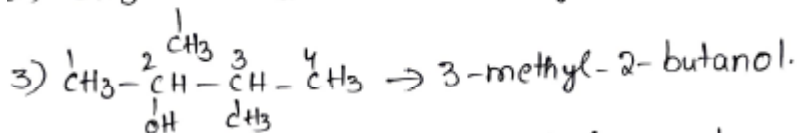
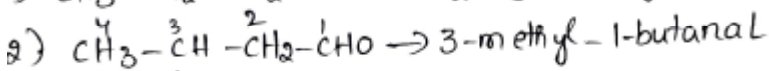
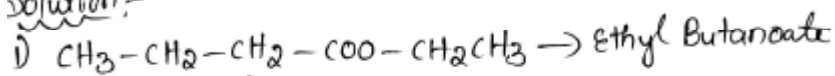
So the correct IUPAC name is 4-methyl-2,4-hexanediol

13. Which of the following compounds has correct IUPAC name ?



Answer:4

Solution:-



14. The IUPAC name of the compound is $\begin{array}{c} \text{Br} \\ | \\ \text{Cl}-\text{C}-\text{CHO} \\ | \\ \text{F} \end{array}$ is

- 1) 2-Bromo-2-chloro-2-fluoroethanal 2) 1-Bromo-1-chloro-2-fluoroethanal
3) 2-Fluoro-2-chloro-2-bromoethanal 4) 2-Fluoro-2-chloro-2-bromoethanal

Answer:1

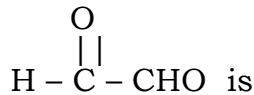
Solution:

The aldehyde carbon is C-1, the substituted carbon is C-2 carrying Br, Cl and F.

Alphabetical order of substituents: bromo, chloro, fluoro."

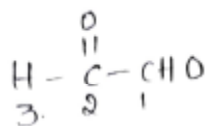
2-Bromo-2-chloro-2-fluoroethanal

15. The correct IUPAC name of

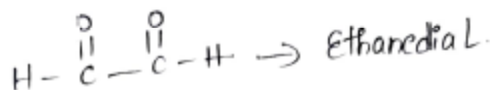


- 1) Formyl methanal 2) 1,2-Ethanedione 3) 2-Oxoethanal 4) Ethanedial

Answer:4



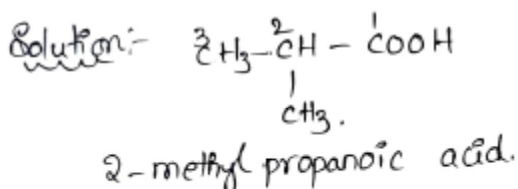
Solution:



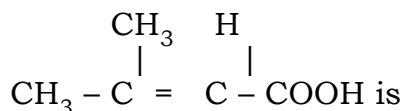
16. The IUPAC name of $(\text{CH}_3)_2 \text{CH}-\text{COOH}$ is

- 1) 2- propanoic acid 2) Isobutanoic acid
3) 2-Methylpropanoic acid 4) 2-Methylbutanoic acid

Answer:3

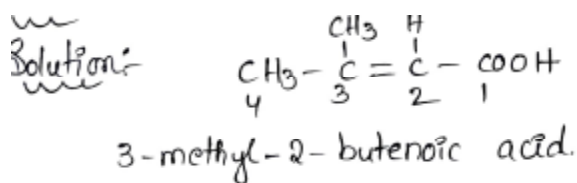


17. The IUPAC name of the formula



- 1) 2- Methyl-2-butenic acid 2) 3- Methyl-3- butenoic acid
3) 3- Methyl -2-butenic acid 4) 2-Methyl-3- butenoic acid

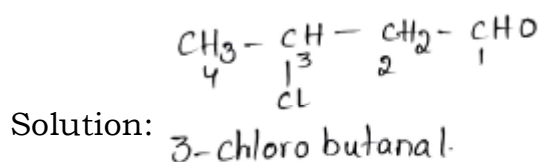
Answer:3



18. IUPAC name of $\text{CH}_3-\text{CHCl}-\text{CH}_2-\text{CHO}$ is

- 1) 2-chloro-4-butanol 2) 3-chloro butane
3) 2-chloro-4-butanal 4) 3-chlorobutanal

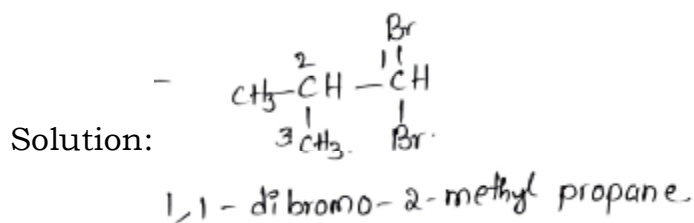
Answer:4



19. IUPAC name of $(\text{CH}_3)_2\text{CH}-\text{CHBr}_2$ is

- 1) 1,1-dibromo -2-methyl propane 2) 2-methyl-3-Bromo propane
3) iso propyl Bromide 4) 3° butyl bromide

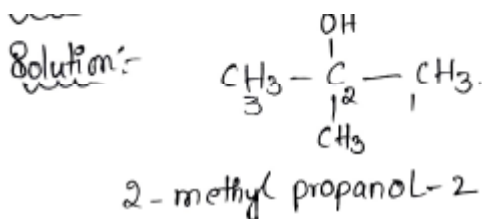
Answer:1



20. IUPAC name of $\text{CH}_3 - \underset{\text{CH}_3}{\underset{|}{\text{C}}}(\text{OH}) - \text{CH}_3$

- 1) sec-butyl alcohol
- 2) pri-butyl alcohol
- 3) 2-methylpropanal
- 4) 2-methylpropanol-2

Answer:4

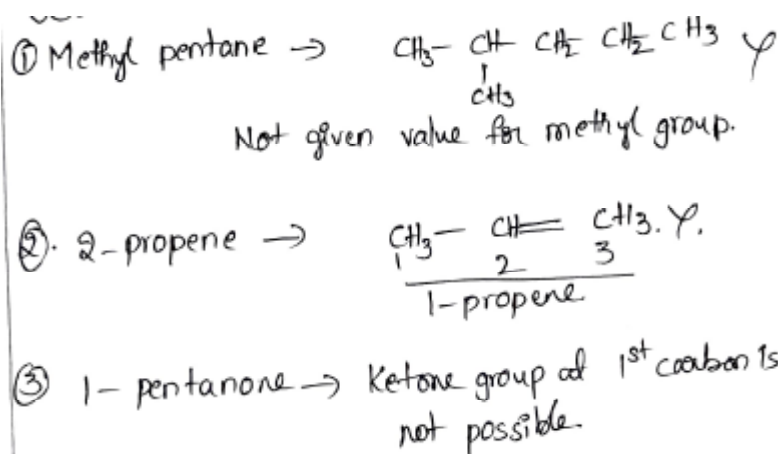


21. Among the following which one represents the correct name of the compound ?

- 1) methyl pentane 2) 2-propene 3) 1-pentanone 4) none

Answer:4

Solution:

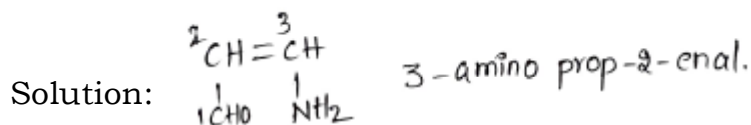


Educational Operating System

22. The IUPAC name of $\text{CH} = \text{CH}$
 $\begin{array}{c} \text{CHO} \quad \text{NH}_2 \end{array}$

- 1) 1-Amino prop-2-enal 2) 3-Amino prop -2-enal
 3) 1-Amino-2-formyl ethene 4) 3-Amino-1-oxoprop-2-ene

Answer:2



JEE ADVANCED LEVEL

Multicorrect Answer Typ

23. Which is not the correct suffixes for alcohols, aldehydes and ketones, according to IUPAC system are respectively

- 1) -ane, -al, -keto 2) -ol, -al, -keto
 3) -ol, -al, -one 4) -ol, -ane, -one

Answer:1,2,4

Solution:-ane, -al, -keto

-ane is for alkanes, not alcohol; "keto" is not a suffix

- ol, -al, -keto → keto is not used as a suffix in IUPAC
 -ol, -al, -one → This is the correct set (so NOT the answer)
 -ol, -ane, -one → -ane is not for aldehydes

Statement Type

24. Assertion (A) : IUPAC name of HOOC-COOH is ethanedioic acid.

Reason (R) : It contains two ketonic and two hydroxy groups.

Answer:3

Solution:Assertion (A): True

HOOC-COOH is oxalic acid; its IUPAC name is ethanedioic acid

Reason (R):False

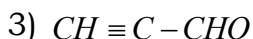
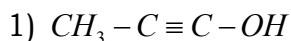
HOOC-COOH contains two carboxyl ($-\text{COOH}$) groups, not ketone ($>\text{C}=\text{O}$) and hydroxyl ($-\text{OH}$) groups separately.

A carboxyl group is a single functional group, not a combination counted separately.

Comprehension Type

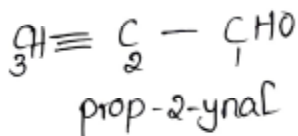
If one functional group and multiple bonds are present, the longest possible chain having the functional group and multiple bonds is taken as the parent chain even if it may not be the longest possible chain. Numbering is done in a way that the functional group gets the lowest possible number followed by the double / triple bond. [Do not care for the lowest sum rule]. The chain terminating groups like $-\text{CHO}$, $-\text{CN}$, $-\text{COOH}$ should always get the number 1 for their carbon atoms irrespective of the above rules.

25. Structure of Prop - 2- ynal



Ans:- 3

Solution:-



H H

| |

26. The I.U.P.A.C.name of $\text{Cl} - \text{C} - \text{C} - \text{Cl}$ is

| |

H H

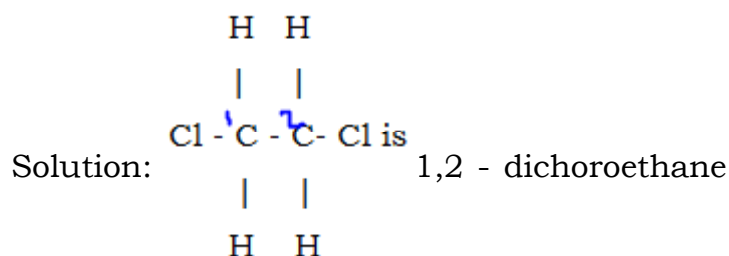
1) 1,2 - dichloroethane

2) 2,2 - dichloroethane

3) 1,1 - dichloroethane

4) Dichloroethane

Answer:1



27. The IUPAC name of $\text{CH}_3\text{CH}_2\text{CH}_2\text{C}(=\text{O})\text{CH}_3$ is

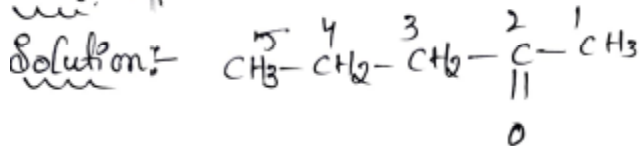


1) 2- pentanone

2) Pentanone -2

3) Pentan - 2- one 4) all are correct

Ans:- 4.



pentanone-2, 2- pentanone,

pentan-2-one.



Matrix Matching Type

28. (Functional Group)

A) -CHO

B) >C=O

C) -NH₂

D) -O-

(Prefix Used)

1) Keto

2) Amino

3) Aldo

4) One

5) Alkoxy

Answer: A - 3, B - 1, C - 2, D - 5

Solution:

A) -CHO

3) Aldo

B) >C=O

1) Keto

C) -NH₂

2) Amino

D) -O-

5) Alkoxy

KEY

			TEACHING TASK						
			JEE MAINS&ADVANCED LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
1	1	2	1	1	1	1	3	1	4
11	12	13	14	15	16	17	18	19	20
4	3	2	3	3	2	1, 3	1, 2		4
21	22	23							
3	4 A – 3, B – 1, C – 5, D – 4								
			LEARNERS TASK						
			CUQ'S						
1	2	3	4	5	6	7	8	9	10
1	4	2	3	4	4	4	1	4	4
11									
4									
			JEE MAINS&ADVANCED LEVEL QUESTIONS						
12	13	14	15	16	17	18	19	20	21
3	4	1	4	3	3	4	1	4	4
22	23	24	25	26	27	28			
2, 1, 2, 4		3	3	1	4 A – 3, B – 1, C – 2, D – 5				