Chapter-1
NOMENCLATURE

There are two systems of *Nomenclature*.

I ***Common Name System***
II ***IUPAC System of Nomenclature.***

I ***Common Name System* :** According to this system of nomenclature the names are given to the compounds according to their origin.

Ex. (a) Acetic acid is derived from the greek word acetum (meaning vinegar)
(b) Formic acid is derived from the word Fermicus (Red ant)

II ***IUPAC System of Nomenclature* :** Following are the steps which must be used to write the IUPAC names of different organic compounds having Polyfunctional groups.

PRIORITY LIST (*Table - A*)

S.No.	Functional group	Formula	Family name	Substitution
1.	Sulphonic acid	$-SO_3H$	Alkane Sulphonic acid	Sulpho
2.	Carboxylic acid	$-\overset{*}{C}OOH$	Akanoic acid or carboxylic acid	Carboxy
3.	Carboxylic acid anhydride	$-\underset{\|\|}{C}-O-\underset{\|\|}{C}-$ (O, O)	Alkanoic acid anhydride	
4.	Ester	$-\overset{*}{C}OOR$	Alkyl alkanoate	Carbalkoxy
5.	Acid halide	$-\overset{*}{C}OX$	Alkanoyl halide	Haloformyl, carbox halide, halocarbonyl
6.	Acid Amide	$-\overset{*}{C}ONH_2$	Alkanamide	Carbomyl, carbamoyl, carboxamido
7.	Cyanide	$-\overset{*}{C}\equiv N$	Alkanenitrile	Cyano
8.	Aldehyde	$-\overset{*}{C}HO$	Alkanal	Formyl. Aldo, Oxo
9.	Ketone	$-\overset{O}{\overset{\|\|}{C}}-$	Alkanone	Oxo, Keto
10.	Alcohol	$-OH$	Alkanol	Hydroxy
11.	Amines	$-NH_2$	Alkanamine	Amino
12.	Thiols	$-SH$	Alkane thiols	Sulphamyl
13.	Ethers	$-OR$	Alkoxyalkane	Alkoxy
14.	Alkene, alkyne	$C=C$, $C\equiv C$	Alkene, alkyne	
15.	Nitro	$-NO_2$	Nitroalkane	Nitro
16.	–X	–X	Haloalkane	Halo
17.	–R, 		Alkyl, Phenyl.	

Note: 1. Those functional gps which have been marked (*) if they behave like main functional groups then there carbon atom must be included in the main chain.

2. Those functional gps which have been marked (*) if they behave like substituents then their carbon atom should not be included in the main chain.

3. If CHO gp is the only substituent then its carbon atom may or maynot be included in the main chain.

Step-I : Indentification of functional groups and classifying them into main, subsidiary and substituent groups.

1. *Main Functional group* : The functional group getting highest priority is called main functional group.
2. *Subsidiary group* : If the molecule contains C = C or C ≡ C apart from Main functional group then the C = C or C ≡ C are called subsidiary group.
3. *Substituent group* : Any other functional group apart from main or subsidiary are called substituents.

1. CH_3CH_2COOH

   Main functional group = – COOH

   Subsidiary = Nil

   Substituent = Nil

2. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH = CH - CONH_2$

   Main Functional group = $-CONH_2$

   Subsidiary = –C = C– [see Table-A]

   Substituent = –OH.

3. $CH_3 - CH = CH - \underset{\underset{CH = CH_2}{|}}{CH} - COBr$

   Main = –COBr

   Subsidiary = C = C

   Substituent = NIL

Step-II: Identification of main chain

Following points should be considered for choosing the main chain.

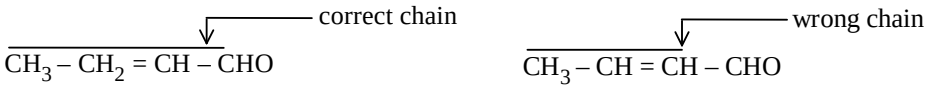
1. The main chain must contain maximum number of main functional groups.
2. It must contain maximum number of subsidiary groups.
3. The main chain must contain maximum number of substituent carrying carbon atoms or side chain carrying carbon atoms.

4. The main chain must contain maximum number of carbon atoms.

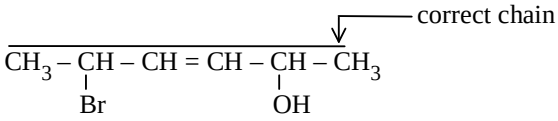
Use the above points for identifying the chain.

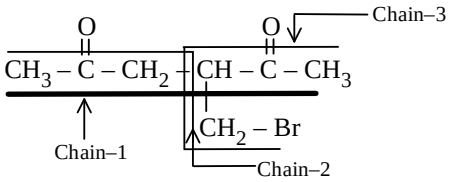
1. 

Here the main functional group is –COOH its carbon atom must be included in the Main Chain.

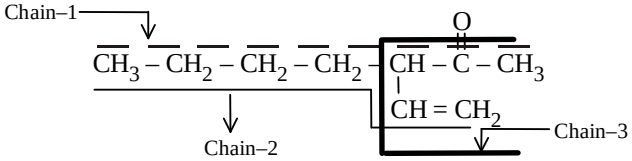
2. 

Reason same as above.

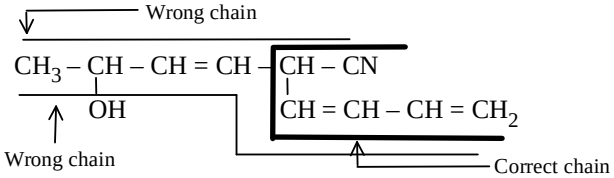
3. 

4. 

Here Chain–1 is correct chain. This is because it contains maximum number of main functional groups which is $-\overset{\overset{O}{\|}}{C}-$ group.

5. 

Here chains–3 is correct chain. This is because it contains the main functional group, the subsidiary group

6. 

This is because the main chain must contain maximum number of main functional group (*i.e.*- CN) and maximum number of subsidiary groups.

Step-III: Numbering the Main Chain

Numbering of the main chain is done according to :

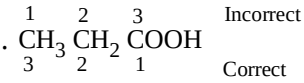
Lowest Number Rule : After selecting the continuous main chain, the numbering is done in such a manner that :

(a) the main functional group gets the lowest number

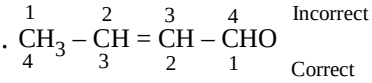
(b) the second lowest number is given to the subsidiary groups

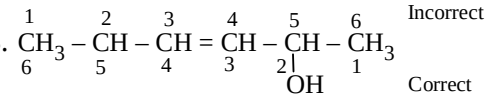
(c) the third lowest number is given to the substituent carrying carbon atom or side chain carrying carbon atom.

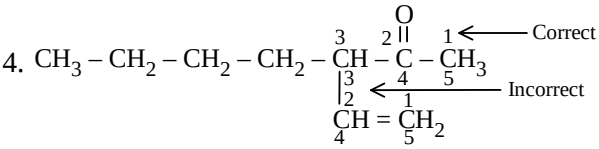
(d) If the main functional group gets the same number in two different ways of numbering then give lower number first to subsidiary and then to substituent carrying carbon atoms.

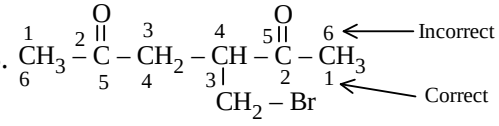
1. 

(Main functional group given lowest number)

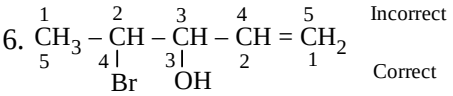
2. 

3. 

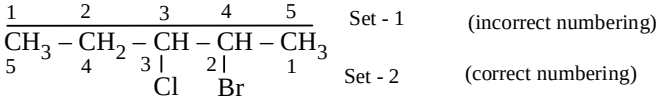
4. 

5. 

When the main chain gets the same number in two different numbering then give preference to subsidiary or substituent carrying carbon atoms

6. 

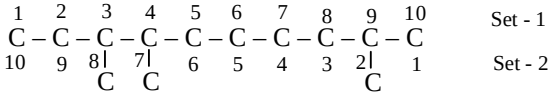
Lowest Sum Rule at the First Sight of Difference : If more than one main functional group or substituents are present in the chain, then their positions are noted and the sets are made of all possible numberings. Then these sets are compared term by term. The preferred numbering is the one which has the lowest term in the set at the first point of difference e.g.

1. 

	Term - I	Term - II
Set -1	3	4
Set -2	2	3

First point of difference the term I - '2' of set - 2 is lower than term I - '3' of set-1.

Therefore set - 2 is preferred.

2. 

	Term - I	Term - II	Term - III	Sum Rule :
Set -1	3	4	9	set - 1 : 3 + 4 + 9 = 16
Set -2	2	7	8	set - 2 : 2 + 7 + 8 = 17.

According to sum rule set - 2 is correct numbering.
According to sum rule set - 1 is correct numbering.
Sum rule is followed.

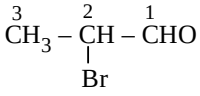
Step - IV: Writing the name

This part consists of

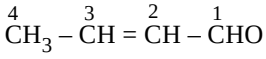
(a) Noun String (Family Name)

(b) Adjective String (Substituents or Side chains)

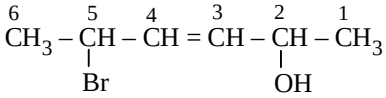
The adjective string is written first and then the noun string e.g.

1. 

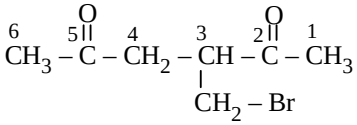
Adjective String = 2-Bromo
Nounstring = Alkanal = Propanal
2-Bromo, proponal.

2. 

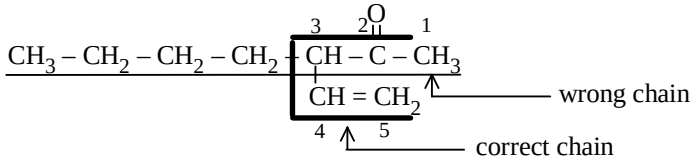
Family Name = Alkenal
But -2-en-1-al.

3. 

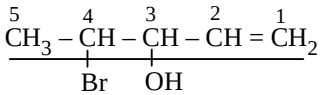
Adjective String = 5-Bromo
Noun String = Hex-3-en-2-ol.
5-Bromo, hex-3-en-2-ol.

4. 

Adjective string = 2-Bromo methyl
Noun = Hexan -2, 5-dione
3-Bromo methyl, hexan -2, 5-dione.

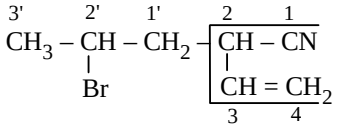
5. 

Adjective String = 3-Butyl
Noun String = Pent-4-en-2-one.
3-Butyl, pent-4-en-2-one

6. 

Adjective string 4-Bromo
Noun string pent-1-en-3-ol

4-Bromo, pent-1-en-3-ol.

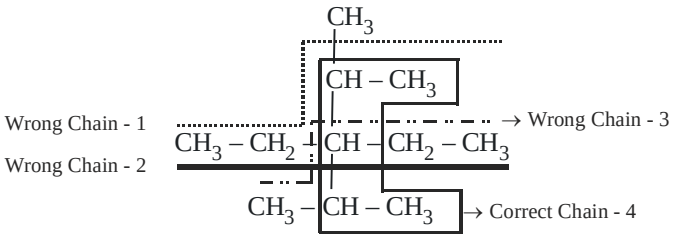
7. 

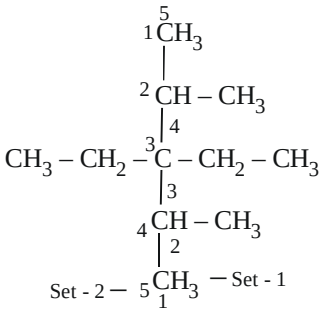
Adjective String = 2-[2′- Bromo Propyl]
Noun String : But -3-ene-1-nitrite.
2-[2′-Bromo propyl], but-3-ene-t-nitrite.

NOMENCLATURE OF SPECIFIC FAMILIES (FEW SELECTED)

1. Alkanes :

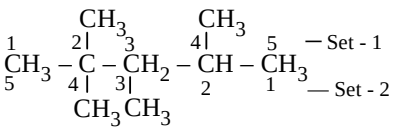
Here since there are no functional groups so the first two points of Step-II (Identification of Main Chain) donot find application hence that chain must be chosen which has maximum number of side chains and maximum number of carbon atoms e.g.

1. 



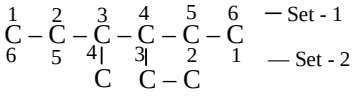
	Term-1	Term-2	Term-3	Term-4
Set - 1	2	3	3	4
Set - 2	2	3	3	4

Here both numberings are correct.
2,4-Dimethyl - 3, 3-diethyl, pentane.

2. 

	Term-1	Term-2	Term-3	Term-4	
Set - 1	2	2	3	4	Correct
Set - 2	2	3	4	4	Wrong

2, 2, 3, 4 - Tetramethyl pentane.

3. 

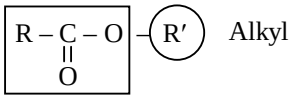
Set - 1 3, 4 (wrong numbering)
Set - 2 3, 4 (correct numbering)

When the set rule comes out to be same give preference to alphabetical order, hence Set(2) numbering is prefered.

3-Ethyl-4-methyl, hexane

2. Esters :

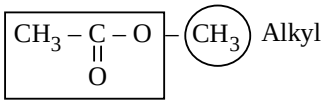
The name written is Alkyl alkanoate



Alkanoate

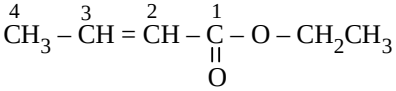
If substituent/Side chain present on alkyl part write these substituents / side chains before writing the alkyl part.

If substituent/side chain present on alkanoante part write before writing the alkanoate part

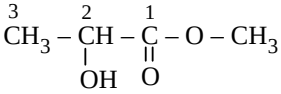


Alkanoate

Methyl ethanoate



Ethyl, but-2-en-1-oate



Methyl-2-hydroxypropanoate

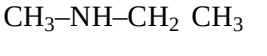
3. Secondary Amines :

Those amines in which the Nitrogen is attached to two carbon atoms are called s-amines.

R–NH – R′

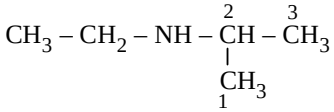
Name : N-alkyl, alkanamine

1. Here 'N' represents Nitrogen so the alkyl group attached to N is called N-alkyl
2. The alkanamine part must satisfy all the conditions for main chain

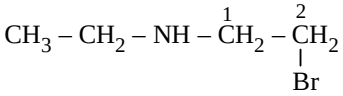


N-Alkyl = N-methyl
Alkanamine = Ethanamine

N-methyl ethanamine



N-Ethyl, propan-2-amine.

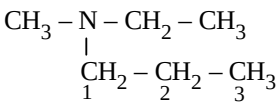


N-Ethyl, 2-bromo, ethanamine

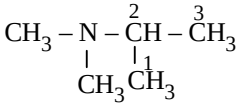
4. Tertiary Amines : Where the nitrogen atom is attached to 3-carbon atoms is called t-amines.

Name : N-Alkyl-N-alkyl alkanamines [when alkyl groups attached to nitrogen are different]

: N, N-Dialkyl alkanamine. [when alkyl groups attached to nitrogen are same] e.g.

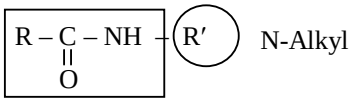
1. 

N-Ethyl-N-methyl propan-1-amine

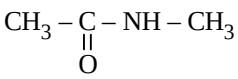


N, N-Dimethyl propan-2-amine

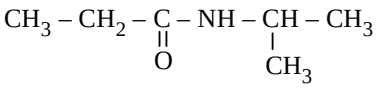
5. N-Substituted Amides : Where in an amide molecule an alkyl group is attached on the nitrogen atom, such molecules are called N-substituted amides e.g.



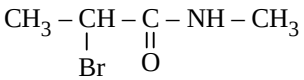
N-Alkyl alkanamide.

1. 

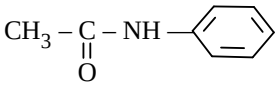
N-Methyl ethanamide

2. 

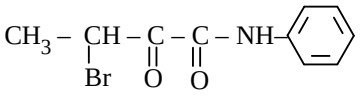
N-(1′-Methyl) ethyl propan amide

3. 

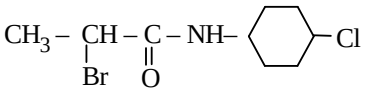
N-Methyl-2-bromo propanamide

4. 

N-Phenyl ethanamide

5. 

N-Phenyl-3-bromo, 2-oxo butanamide

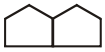


N-[(Chloro)cyclohexyl] Propanamide

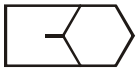
NOMENCLATURE OF BICYCLOALKANES

These are compounds containing two fused rings. Following points are taken into consideration while naming such compounds.

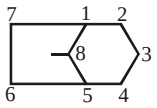
1. Compound is named as bicycloalkane corresponding to total number of C-atoms.
2. The number of carbon atoms in each of the bridges are written in brackets in descending order.

   For example,   

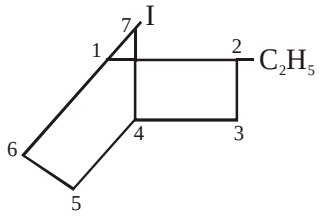
   Bicyclo [3.1.0] hexane Bicyclo [3.3.0] octane Bicyclo [4.2.0] octane
3. In case of substituents present in bicyclic compounds, the numbering of chain is done from the longest bridged ring beginning at one bridge head. The numbering is the next longest bridge and thus shortest bridge is numbered at least.

   For example, 

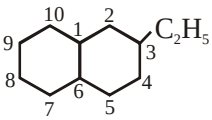
   This structure has two rings. One is a six membered and other one is five membered. While numbering it starts from longest bridge (showing six membered) then shortest bridge (five membered) followed by third bridge. Thus its numbering is done as



IUPAC name is 8-methyl bicyclo [3.2.1] octane.



2-Ethyl-7-iodo bicyclo [2.2.1] heptane

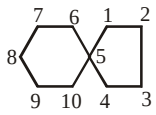


3-Ethyl bicyclo [4.4.0] decane

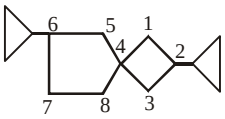
NOMENCLATURE OF SPIRO COMPOUNDS

If two rings are joined by quaternary carbon at the apex, then they are prefixed by the word spiro followed by brackets containing the number of carbon atoms in each ring of both side of common point

in ascending order and then by the name of parent hydrocarbon containing total number of carbon atoms in the two rings. The numbering starts from the atom next to the spiro atom (atom joining the ring) and process through the smaller ring first. For example



Spiro [4.5] decane



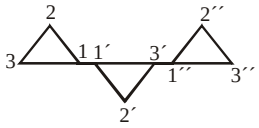
2,6-di(cyclopropyl)-spiro [3.4] octane

NOMENCLATURE OF UNBRANCHED IDENTICAL HYDROCARBON RING SYSTEMS HAVING NO COMMON POINTS

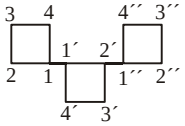
1. Unbranched assemblies consisting of three or more identical hydrocarbon ring systems are named by placing an appropriate numerical prefix before the name of the hydrocarbon corresponding to the repetitive unit. The following numerical prefixes are used:

3: ter	4 : quater	5: quinque	6: sexi	7: septi
8: secti	9: noni	10 : deci		

2. Unprimed numbers are assigned to one of the terminal systems, the other systems being primed serially. Points of attachment are assigned the lowest number possible. For example.

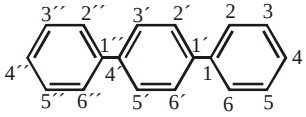


1–1´, 3´ - 1´´-tercyclopropane

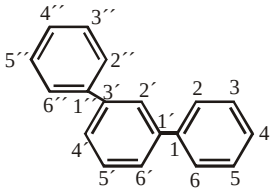


1, 1´, 2´, 1´´ - tercyclobutane

3. As exceptions, unbranched assemblies consisting of benzene rings are named by using the appropriate prefix with the radical name “phenyl”.



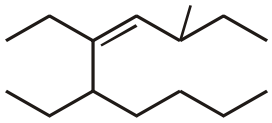
p-terphenyl or 1, 1´, 4´, 1´´-terphenyl



m-terphenyl or 1, 1´, 3´, 1´´-terphenyl

PREVIOUS YEAR QUESTIONS

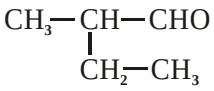
IIT-JEE/JEE-ADVANCE QUESTIONS

1. The correct IUPAC name of the compound,  is

(a) 5,6-Diethyl-8-methyldec-6-ene (b) 6-Butyl-5-ethyl-3-methyloct-4-ene

(c) 5,6-Diethyl-3-methyldec-4-ene (d) 2,4,5-Triethylnon-3-ene

2. Choose the correct IUPAC name for



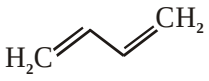
(a) Butan-2-aldehyde (b) 2-Methylbutanal

(c) 3-Methylisobutyraldehyde (d) 2-Ethylpropanal

3. In compound, CH_2=CH–CH_2–CH_2–C≡H, the C_2–C_3 bond is of the type

(a) sp–sp^2 (b) sp^3–sp^3 (c) sp–sp^3 (d) sp^2–sp^3

4. Which of the following represents the given mode of hybridization sp^2–sp^2–sp–sp from left to right?

(a) H_2C=CH–C≡N (b) HC≡C–C≡H (c) H_2C=C=C=CH_2 (d) 

5. IUPAC Name of the 

(a) Chlorophenyl ketone (b) Chloroaceto benzene

(c) Benzenecarbonyl chloride (d) Benzoyl chloride

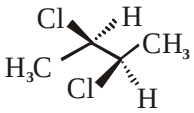
6. The number of structural isomers for C_6H_{14} is

(a) 3 (b) 4 (c) 5 (d) 6

7. The hybridization of carbon atoms in C–C single bond of HC≡C–CH=CH_2 is

(a) sp^3 – sp^3 (b) sp^2 – sp^3 (c) sp – sp^2 (d) sp^3 – sp

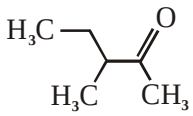
8. The correct statement(s) about the compound given below is (are)



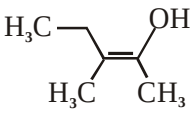
(a) The compound is optically active (b) The compound possesss centre of symmetry

(c) The compound possesses plane of symmetry (d) The compound possesses axis of symmetry

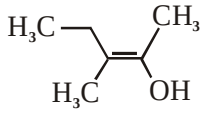
9. The correct statement(s) concerning the structures **E, F** and **G** is (are)



(**E**)



(**F**)



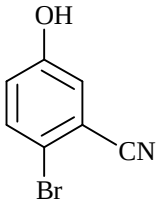
(**G**)

(a) **E, F** and **G** are resonance structures

(b) **E, F** and **E, G** are tautomers

(c) **F** and **G** are geometrical isomers

(d) **F** and **G** are diastereomers

10. The IUPAC name of the following compound is 

(a) 4-Bromo-3-cyanophenol

(b) 2-Bromo-5-hydroxybenzonitrile

(c) 2-Cyano-4-hydroxybromobenzene

(d) 6-Bromo-3-hydroxybenzonitrile

11. The correct statement(s) about the compound $H_3C/(HO)HC - CH = CH - CH(OH)CH_3$ (X) is(are)

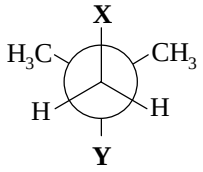
(a) The total number of stereoisomers possible for **X** is 6

(b) The total number of diastereomers possible for **X** is 3

(c) If the stereochemistry about the double bond in **X** is *trans*, the number of enantiomers possible for **X** is 4

(d) If the stereochemistry about the double bond in **X** is *cis*, the number of enantiomers possible for **X** is 2.

12. The total number of cyclic structural as well as stereo isomers possible for a compound with the molecular formula C_5H_{10} are

13. In the Newman projection for 2,2-dimethylbutane  **X** and **Y** can respectively are

(a) H and H

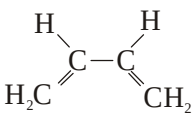
(b) H and C_2H_5

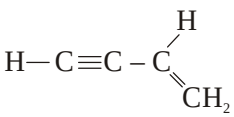
(c) C_2H_5 and H

(d) CH_3 and CH_3

14. The total number of cyclic isomers possible for a hydrocarbon with the molecular formula C_4H_6 is

15. Amongst the given options, the compound(s) in which all the atoms are in one plane in all the possible conformations (if any), is (are)

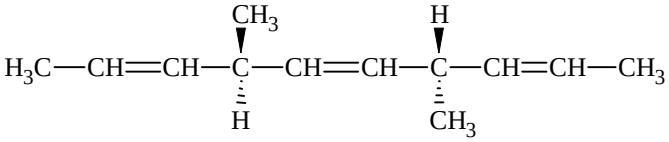
(a) 

(b) 

(c) $H_2C=C=O$

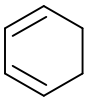
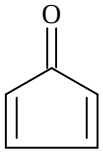
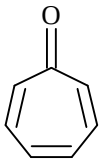
(d) $H_2C=C=CH_2$

16. The number of optically active products obtained from the **complete** ozonolysis of the given compound is

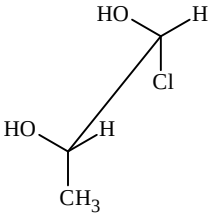


(a) 0 (b) 1 (c) 2 (d) 4

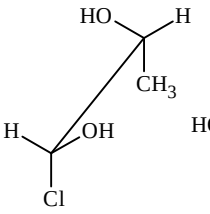
17. Which of the following molecules, in pure form, is (are) **unstable** at room temperature?

(a)  (b)  (c)  (d) 

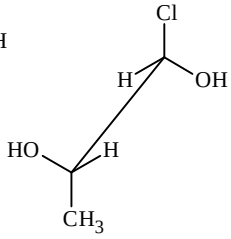
18. Which of the given statement(s) about **N, O, P** and **Q** with respect to **M** is (are) correct?



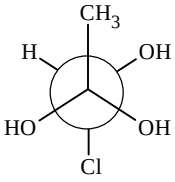
M



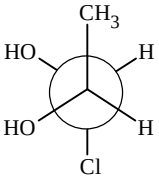
N



O



P



Q

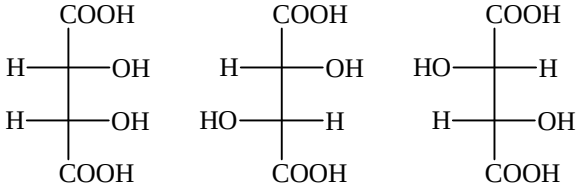
(a) **M** and **N** are non-mirror image stereoisomers (b) **M** and **O** are identical

(c) **M** and **P** are enantiomers (d) **M** and **Q** are identical

Paragraph for Question 19 to 20

P and **Q** are isomers of dicarboxylic acid $C_4H_4O_4$. Both decolorize Br_2/H_2O. On heating. **P** forms the cyclic anhydride.

Upon treatment with dilute alkaline $KMnO_4$, **P** as well as **Q** could produce one or more than one from **S**, **T** and **U**.



S **T** **U**

19. Compound formed from **P** and **Q** are, respectively,

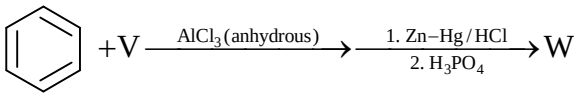
(a) Optically active **S** and optically active pair (**T**, **U**)

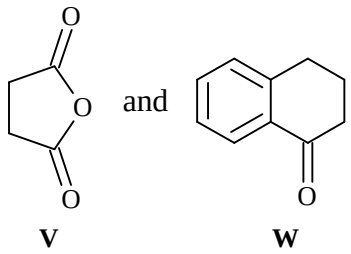
(b) Optically inactive **S** and optically inactive pair (**T**, **U**)

(c) Optically active pair (**T**, **U**) and optically active **S**

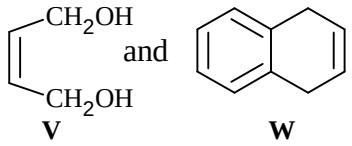
(d) Optically inactive pair (**T**, **U**) and optically inactive **S**

20. In the following reaction sequences **V** and **W** are, respectively $Q \xrightarrow[\Delta]{H_2/Ni} V$

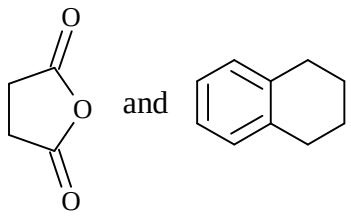


(a) 

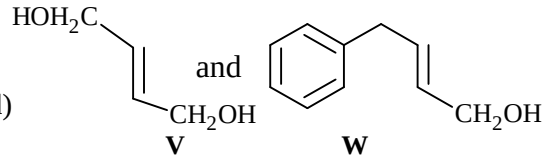
V **W**

(b) 

V **W**

(c) 

V **W**

(d) 

V **W**

DCE QUESTIONS

1. The compound which contains all the four 1°, 2°, 3° and 4° carbon atoms is

(a) 2,3-Dimethylpentene (b) 3-Chloro-2,3-dimethylpentene

(c) 2,3,4-Trimethylpentane (d) 3,3-Dimethylpentane

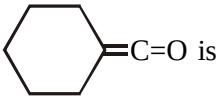
2. Indicate the wrongly named compound

(a) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_2-CHO$
(4-methyl-1-pentanal)

(b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-C\equiv C-COOH$
(4-methyl-2-pentyn-1-oic acid)

(c) $CH_3CH_2CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-COOH$
(2-methyl-1-pentanoic acid)

(d) $CH_3CH_2-CH=CH-\overset{\displaystyle O}{\overset{\|}{C}}-CH_3$
(3-hexen-5-one)

3. The IUPAC name of 

is

(a) Cyclohexanone (b) Cyclohexylmethanone

(c) Oxycyclohexene (d) Cyclohexylidenemethanone

4. The IUPAC name of $CH_3-\underset{\displaystyle OH}{\overset{\displaystyle H}{\overset{|}{\underset{|}{C}}}}-CH_2-CH_2-CH_2-\underset{\displaystyle Br}{\overset{\displaystyle Br}{\overset{|}{\underset{|}{C}}}}-CH_3$ is

(a) 6,6-Dibromoheptan-2-ol (b) 2,2-Dibromoheptan-6-ol

(c) 6,6-Dibromoheptan-2-al (d) none of these

AIEEE/JEE-MAINS QUESTIONS

1. Which of the following compound has wrong IUPAC name?

(a) $CH_3-CH_2-CH_2-COO-CH_2CH_3$ Ethyl butanoate

(b) $CH_3-CH(CH_3)-CH_2-CHO$ 3-methylbutanal

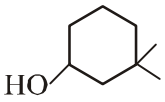
(c) $CH_3-CH(OH)-CH(CH_3)-CH_3$ 2-methyl-3-butanol

(d) $CH_3-CH(CH_3)-C(=O)-CH_2-CH_3$ 2-methyl-3-pentanone

2. The IUPAC name of $CH_3COCH(CH_3)_2$ is

(a) 2-methyl-3-butanone (b) 4-methylisopropyl ketone

(c) 3-methyl-2-butanone (d) Isopropyl methyl ketone

3. The IUPAC name of the compound  is

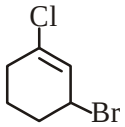
(a) 3, 3-dimethyl-1-cyclohexanol (b) 1, 1-dimethyl-3-hydroxy cyclohexane

(c) 3, 3-dimethyl-1-hydroxy cyclohexane (d) 1, 1-dimethyl-3-cyclohexanol

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

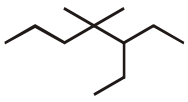
(a) Acetonitrile (b) Acetic acid (c) Acetone (d) Acetamide

5. The IUPAC name of the compound shown below is



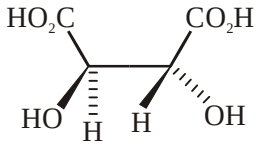
(a) 1-bromo-3-chlorocyclohexene (b) 2-bromo-6-chlorocyclohex-1-ene

(c) 6-bromo-2-chlorocyclohexene (d) 3-bromo-1-chlorocyclohexene

6. The IUPAC name of  is

(a) 5, 5-diethyl-4, 4-dimethylpentane (b) 3-ethyl-4, 4-dimentylheptane.

(c) 1, 1-diethyl-2, 2-dimethylpentane (d) 4, 4-dimethyl-5, 5-dimethylpentane

7. The absolute configuration of  is

(a) R, R (b) R, S (c) S, R (d) S, S

8. 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

9. The IUPAC name of neopentane is:

(a) 2,2-dimethylpropane (b) 2-methylpropane

(c) 2,2-dimethylbutane (d) 2-methylbutane

10. The alkene that exhibits geometrical isomerism is:

(a) 2-methyl propene (b) 2-butene (c) 2-methyl-2-butene (d) propene

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

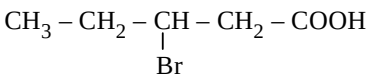
(a) 2 (b) 4 (c) 6 (d) 3

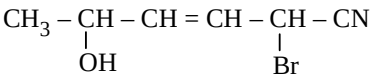
12. Identify the compound that exhibits tautomerism.

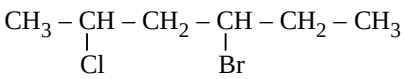
(a) 2-Butene (b) Lactic acid (c) 2-Pentanone (d) Phenol

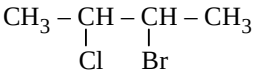
SUBJECTIVE PROBLEMS

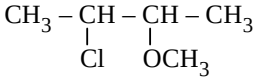
Assign IUPAC name for the following compounds :

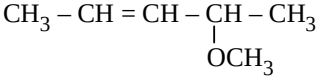
1. 

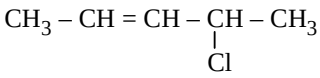
2. 

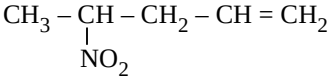
3. 

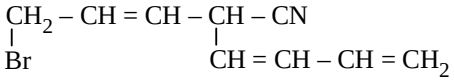
4. 

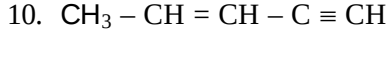
5. 

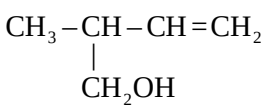
6. 

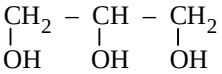
7. 

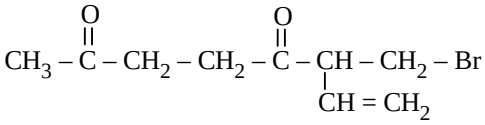
8. 

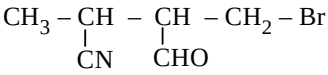
9. 

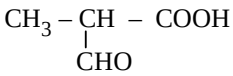
10. 

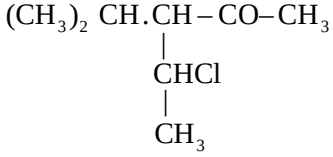
11. 

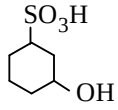
12. 

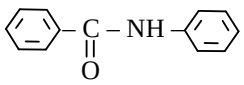
13. 

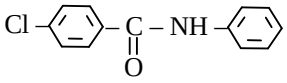
14. 

15. 

16. 

17. 

18. 

19. 

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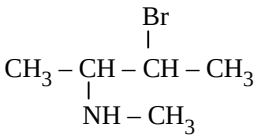
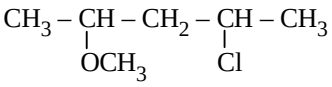
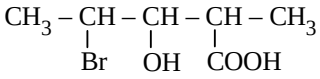
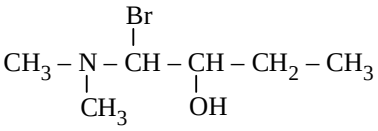
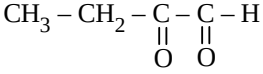
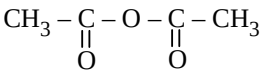
21. 

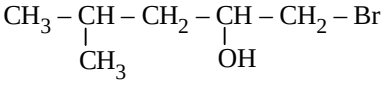
22. 

23. 

24. 

25. 

26. 

27. 

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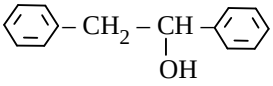
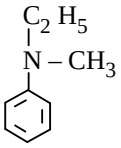
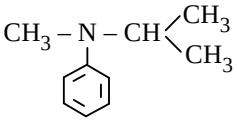
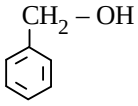
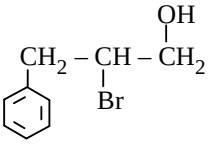
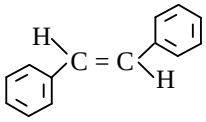
29. 

30. 

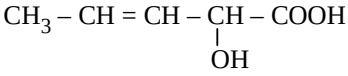
31. 

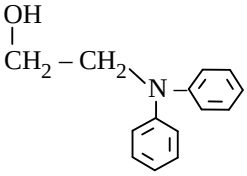
32. 

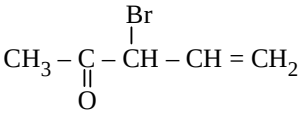
33. 

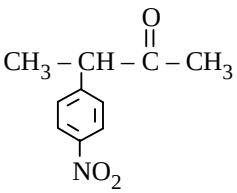
34. 

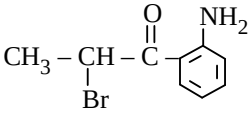
35. $CH_3 - CH = CH - CHO$

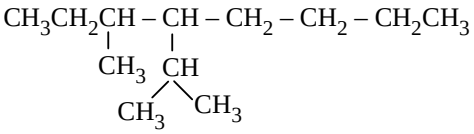
36. 

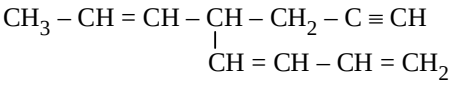
37. 

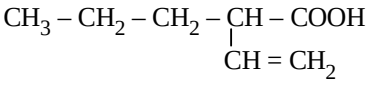
38. 

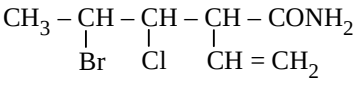
39. 

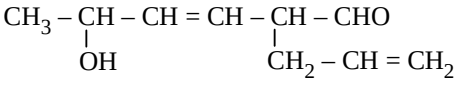
40. 

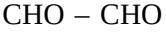
41. 

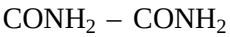
42. 

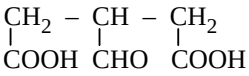
43. 

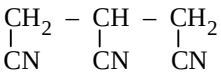
44. 

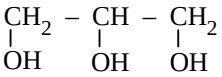
45. 

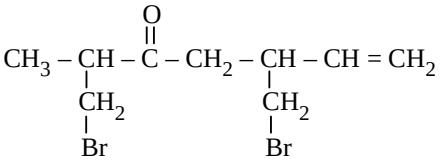
46. 

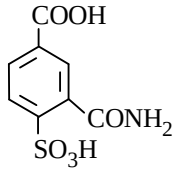
47. 

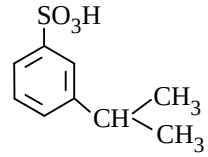
48. 

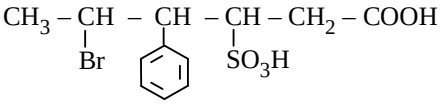
49. 

50. 

51. 

52. 

53. 

54. 

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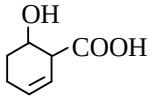
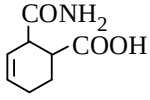
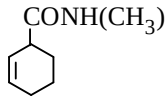
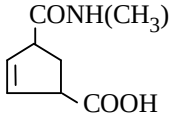
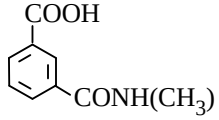
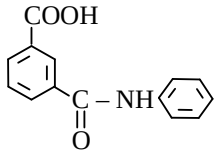
56. 

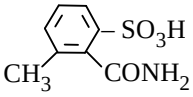
57. 

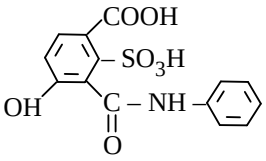
58. 

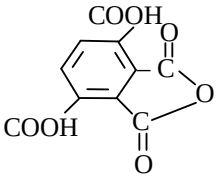
59. 

60. 

61. 

62. 

63. 

64. 

55. $CH_3 - \underset{\underset{OH}{|}}{CH} - \underset{\underset{O}{||}}{C} - \underset{\underset{O}{||}}{C} - O - CH_3$

66. $CH_3 - CH_2 - \underset{\underset{O}{||}}{C} - \underset{\underset{O}{||}}{C} - NH - C_6H_5$

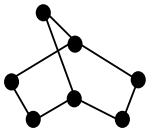
67. $CH_3 - CH_2 - \underset{\underset{O}{||}}{C} - \underset{\underset{O}{||}}{C} - O - CH_2 - CH_2 - NH_2$

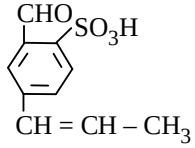
68. $CH_3 - \underset{\underset{O}{||}}{C} - CH_2 - \underset{\underset{NH - CH_3}{|}}{CH} - CH_3$

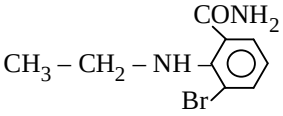
69. $CH_3 - CH_2 - \underset{\underset{O}{||}}{C} - O - CH_2 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{NH_2}{|}}{CH_3}$

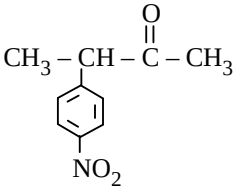
70. $CH_3 - \underset{\underset{CH_2CH_3}{|}}{N} - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3$

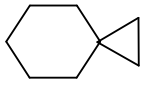
71. 

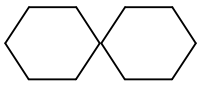
72. 

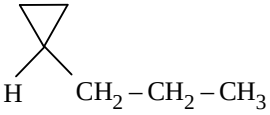
73. 

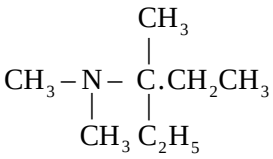
74. 

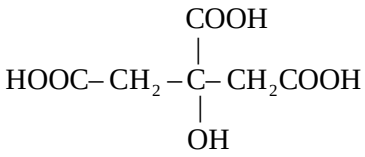
75. 

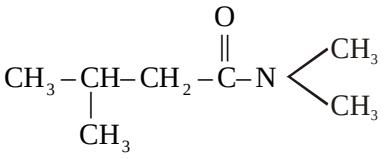
76. 

77. 

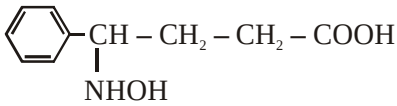
78. 

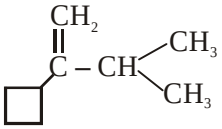
79. 

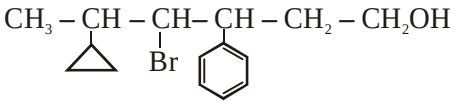
80. 

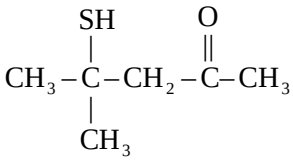
81. 

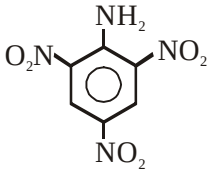
82. 

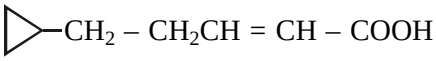
83. 

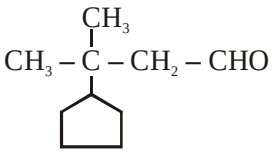
84. 

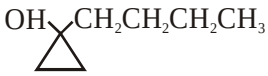
85. 

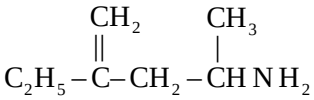
86. 

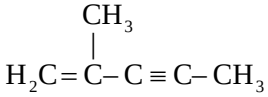
87. 

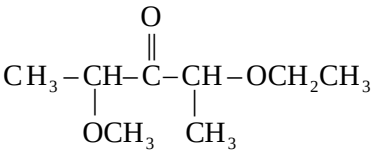
88. 

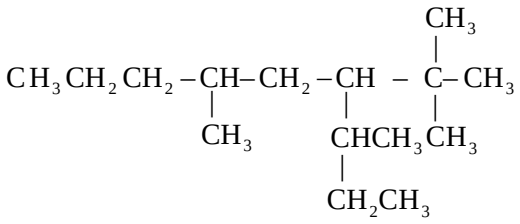
89. 

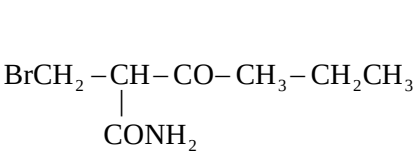
90. 

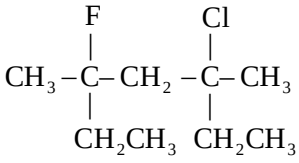
91. 

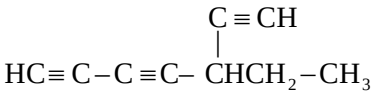
92. 

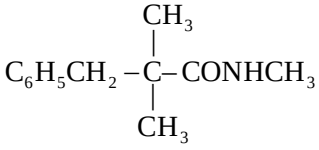
93. 

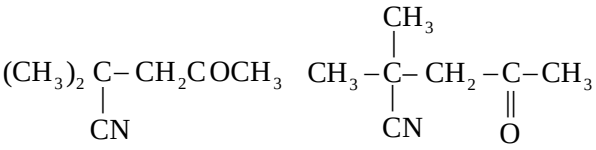
94. 

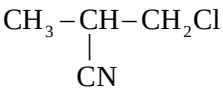
95. 

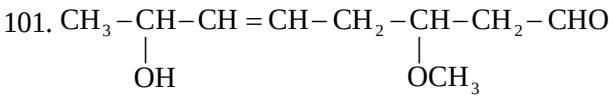
96. 

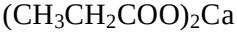
97. 

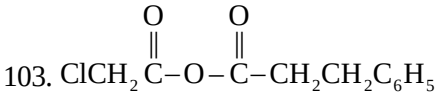
98. 

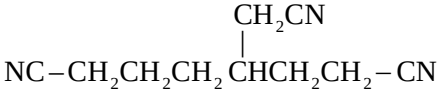
99. 

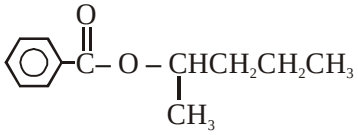
100. 

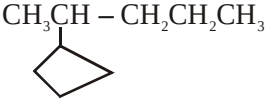
101. 

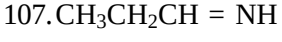
102. 

103. 

104. 

105. 

106. 

107. 

108. 

109. $HO-CH_2CH_2-\underset{\displaystyle CONH_2}{\underset{|}{CH}}-CH=CH_2$

110. $CH_3CH=CH-CH_2\underset{\displaystyle Cl}{\underset{|}{CH}}-Br$

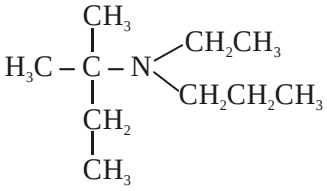
111. $CH_3CH=CH-CH_2\ CH_2OH$

112. $CH_3CH=CH(CH_2)_2CCl_3$

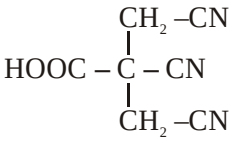
113. $(CH_3)_3C-(CH_2)_4OH$

114. $CH_3OCH_2CH_2OCH_2OCH_2CH_2CH_3$

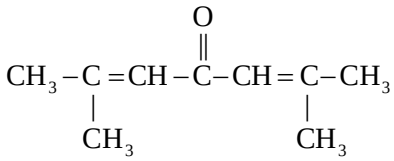
115. $CH_2=CH-CH_2-\overset{\displaystyle O}{\overset{\|}{C}}-CH=CH_2$

116. 

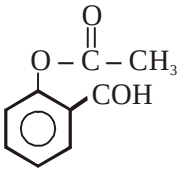
117. $(CH_3CH_2)_2N-CHO$

118. 

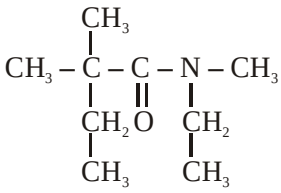
119. $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=CH-\underset{\displaystyle O}{\underset{\|}{C}}-CH_3$

120. 

121. $HO-CH-COONa$
$\quad\quad|$
$HO-CH-COOK$

122. 

123. $H_2N-\overset{\displaystyle O}{\overset{\|}{C}}-(CH_2)_4-\overset{\displaystyle O}{\overset{\|}{C}}-OH$

124. 

ANSWERS

Previous Year Questions

IIT-JEE/JEE-ADVANCE QUESTIONS

1.	(c)	2.	(b)	3.	(d)	4.	(a)	5.	(c)
6.	(c)	7.	(c)	8.	(a)	9.	(b,c,d)	10.	(b)
11.	(c,d)	12.	7	13.	(b,d)	14.	5	15.	(a,b,c)
16.	(a)	17.	(b,c)	18.	(b,c)	19.	(b)	20.	(a)

DCE QUESTIONS

1.	(b)	2.	(d)	3.	(d)	4.	(a)

MAINS QUESTIONS

1.	(c)	2.	(c)	3.	(a)	4.	(a)	5.	(d)
6.	(b)	7.	(a)	8.	(a)	9.	(a)	10.	(b)
11.	(b)	12.	(c)						

Subjective Problems

1. 3-Bromopentanoic acid
2. 2-Bromo-5-hydroxy, hex-3-ene-1-nitrile
3. 4-Bromo-2-chloro hexane
4. 2-Bromo-3-chloro butane
5. 3-Chloro-2-methoxy butane
6. 2-Methoxy pent-3-ene
7. 4-Chloro pent-2-ene
8. 4-Nitro-pent-1-ene
9. 2-[3-Bromo,1-propenyl), hex-3, 5-dien-1-nitrile
10. Pent-3-en-1-yne
11. 2-Methylbut-3-en-1-ol
12. Propan-1,2,3-triol
13. 6-Bromomethyl oct-7-en-2, 5-dione
14. 4-Bromo-3-formyl-2-methyl butane nitrile
15. 2-Methyl-3-oxo propanoic acid
16. 4-Chloro-3-(1-methyl ethyl) Pentan-2-one
17. 3-Hydroxy cyclohexane sulphonic acid
18. N-Phenyl benzamide
19. N-Phenyl-4-chlorobenzamide
20. Hydroxymethyl ethanoate
21. N-methyl-3-bromo butan-2-amine
22. 4-chloro-2-methoxy pentane
23. 4-Bromo-3-hydroxy-2-methyl Pentanoic acid
24. 1-Bromo-1-(N, N-Dimethyl amino) butan-2-ol
25. 2-oxo butanal
26. Ethanoic acid anhydride
27. 1-Bromo-4-methyl, pentan-2-ol
28. Bicyclo[4.4.0] decane
29. 1, 2-Diphenyl ethan-1-ol
30. N-Ethyl-N-methyl aniline

31. N-Methyl-N-phenyl propan-2-amine
32. Phenyl methanol
33. 2-Bromo-3-phenyl propan-1-ol
34. Trans-1, 2-diphenyl ethene
35. But-2-en-1-al
36. 2-Hydroxy pent-3-en-1-oic acid
37. 2-(N, N-Diphenyl amino), ethan-1-ol
38. 3-Bromo, pent-4-en-2-one
39. 3-(4-Nitro phenyl), butan-2-one
40. 1-(2-Amino)phenyl-2, bromo, propan-1-one
41. 3-Methyl, (2-Methyl ethyl) octane
42. 5[1′–propenyl], oct-1, 3-dien-7-yne
43. 2-propyl but-3-enoic acid
44. 2-(2-Bromo-1-chloro propyl), but-3-en-1-amide
45. 5-Hydroxy-2-(2-propenyl), hex-3-en-1-al
46. Ethandial
47. Ethandiamide
48. 3-Formyl, pentan-1, 5-dioic acid
49. Propane-1, 2, 3-tricarbonitrile
50. Propan-1,2,3-triol
51. 2, -5-dibromo methyl, hept-7-en-3-one
52. 2-carboxamido, 4-carboxy, benzene sulfonic acid
53. 3-(1-methyl ethyl), benzene sulfonic acid
54. 1-carboxy, 4-bromo, 3-phenyl, pentane-2-sulphonic acid
55. 1-Carbamyl methanoic acid
56. 6-Hydroxy, Cyclohex 2-en-1-carboxylic acid
57. 2-Carboxamidocyclohex, 3-en-1-carboxylic acid
58. cyclohex-2-en-1-N-methyl carboxamide
59. 4-(N-methyl) carboxamido, cylopent-2-ene -1-carboxylic acid
60. 3-(N-methyl)carboxamido, benzoic acid
61. 3-(N-phenyl)carboxamido, benzoic acid
62. 2-carboxamido-3-methyl benzene sulfonic acid
63. 2-[-N-Phenyl carboxamido], -6-carboxy-3-hydroxy benzene sulfonic acid
64. Benzene-1, 4-di carboxylic acid -2, 3-anhydride
65. Methyl-3-hydroxy-2-oxobutanoate
66. N-Phenyl-2-oxo butanamide
67. (2-Amino ethyl), 2-oxo butanoate
68. 4-(N-methyl amino), pentan-2-one
69. (3-Amino, 2-bromo)prophyl propanoate
70. N-Ethyl-N-methyl-2-bromopropan-1-amine
71. Bicyclo[4.4.0] decane
72. Bicyclo [2.2.1] heptane
73. 2-Formyl-4(1′-Propenyl) benzene sulfonic acid
74. 3-Bromo-2-(N-ethyl)amino benzanide
75. 3-(4-Nitro) phenyl, butan-2-one
76. spiro [5.2] octane
77. spiro [5.5] undecane
78. 1-cyclopropyl propane
79. N, N, 3-Trimethylpentan-3-amine
80. 2-Hydroxy propane-1, 2, 3-tricarboxylic acid
81. N, N 2-Trimethyl propane-1-carboxamide
82. Propane-1,2,3-tricarbonitrile
83. (N-Hydroxylamino)-4-phenyl butanoic acid or (N-Hydroxylamino)-3-phenyl propane-1-carboxylic acid.

84. 2-Cyclobutyl-3-methyl but-1-ene
85. 4-bromo-5-cyclopropyl-3-phenyl hexan-1-ol
86. 4-Methyl-4-sulfanyl pantan-2-one
87. Common Name : Picramide 2, 4, 6 - Trinitro benzenamine
88. 5-Cyclopropyl pent-2-enoic acid OR 4-Cyclopropyl but-1-ene 1-1carboxylic acid
89. 2-Cyclopentyl-2-methyl propane-1-carbaldehyde OR 3-Cyclopentyl-3-methylbutanal
90. 1-Butylcyclopropanol
91. 4-Ethylpent-4-en-2-amine
92. 2-Methylpent-1-en-3-yne
93. 2-Ethoxy-4-methoxy pentan-3-one or 3, 5-Dimethyl-2-, 6-dioxaoctane
94. 2, 2,6-Trimethyl-4-(1-methylpropyl) nonane
95. 2-Bromomethyl-3-oxo hexanamide OR 1-Bromo-3-oxohexane-2-carboxamide
96. 3-Chloro-5-fluoro-3, 5-dimethyl heptane
97. 5-ethyl hept-1, 3, 6-triyne
98. N-2, 2,-Trimethyl-3-phenyl propanamide OR N, 2-Dimethyl-3-phenyl propane -2-carboxamide
99. 2-Methyl-4-oxopentane-2-carbonitrile OR 2, 2-Dimethyl-4-oxopentane nitrile
100. 3-Chloro-2-methyl propane nitrile OR 1-Chloropropane-2-carbonitrile
101. 7-Hydroxy-3-methoxy, oct-5-enal OR 6-Hydroxy-2-methoxy hept-4-ene-1-carbaldehyde
102. Calcium propanoate OR Calcium ethane carboxylate
103. Chloro ethanoic-3-phenyl propanoic anhydride OR Chloromethane carboxylic-2-phenyl ethane carboxylic anhydride.
104. 4-Cynomethyl octane dinitrile OR 3-Cyanomethyl hexane -1, 6-dicarbonitrile
105. Sec. pentyl benzene carboxylate OR pent-2-yl benzene carboxylate OR Pent-2-yl phenyl methanoate
106. 2-cyclo butyl pentane
107. Propan-1-imine
108. Cyclohexa-1, 4-diene
109. 5-Hydroxy pent-1-ene-3-carboxamide OR 2-(2-Hydroxyethyl) but-3-enamide
110. 5-Bromo-5-chloropent-2-ene
111. Pent-3-en-1-ol
112. 6, 6, 6-Trichlorohex-2-ene
113. 5, 5-dimethyl hexan-1-ol
114. 2, 5, 7-trioxadecane
115. Hexa-1, 5-dien-3-one
116. N-Ethyl-2-methyl N-propylbutan-2-amine
117. N, N-Diethyl methanamide
118. 1, 2, 3-Tricyano propane-2-carboxylic acid OR 2, 3-Dicyano-2-cyanomethyl propanoic acid
119. 4-methylpent-3-en-2-one
120. 2,6-Dimethyl hepta-2, 5-dien-4-one
121. Potasium sodium-2, 3-dihydroxy butanediote OR Potasium sodium -1, 2,-dihydroxyethane-1, 2-dicarboxylate
122. 2-Acetoxy benzene carboxylic acid OR 2-Acetoxy phenyl methanoic acid
123. 5-Cabamoyl pentanoic acid OR 4-Carbamoyl butane-1-carboxylic acid
124. N-Ethyl-N,2,2-trimethyl butanamide OR N-Ethyl-N,2-dimethyl butane-2-carboxamide