

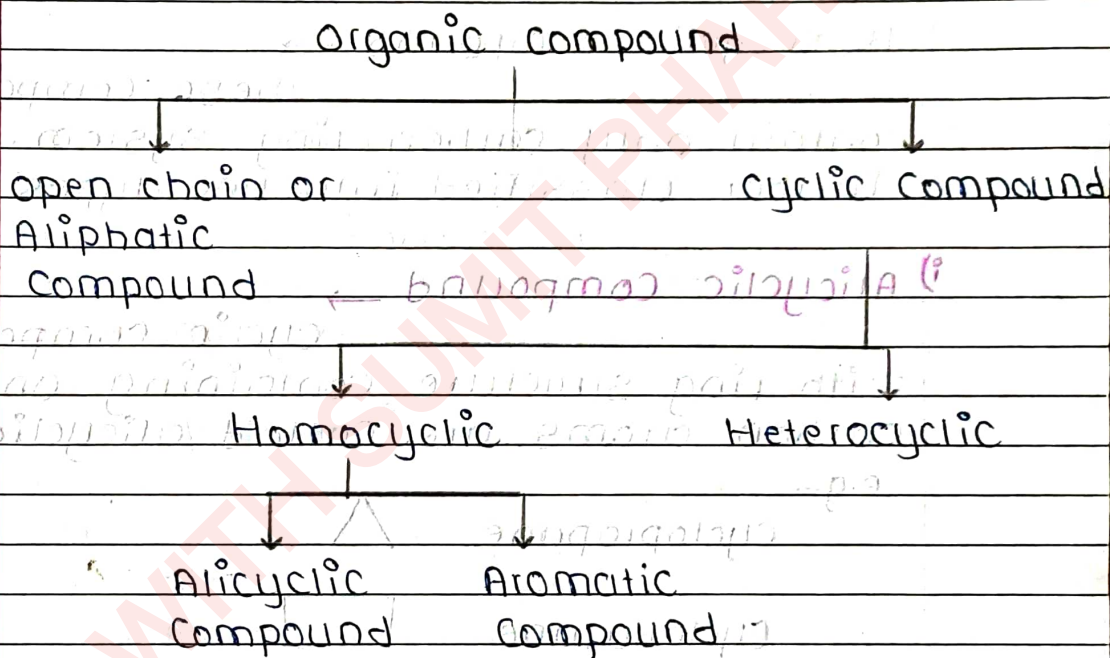
Unit - I

* Classification, Nomenclature and Isomerism *

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① Classification of organic compounds →

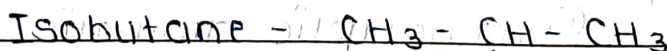
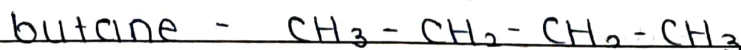
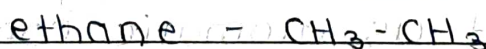
organic compounds are classified into two types -



① Open chain →

These are the compounds in which carbon atoms are linked to each other in linear or branched manner

e.g.



② Cyclic Compounds →

These are organic compounds which have closed chain of atoms. It is classified into 2 types

a) Homocyclic compound →

These compound contain only carbon ring system. It is further classified into two types

i) Alicyclic compound →

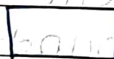
cyclic compound with ring structure containing only carbon atoms are called alicyclic comp.

e.g....

cyclopropane



cyclobutane



cyclopentane



ii) Aromatic compound →

Compounds containing one or more benzene rings in their str. are called as aromatic compounds

e.g....

① monocyclic aromatic compound

benzene

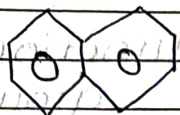


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a) Polycyclic aromatic compound benzene naphthalene

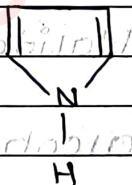


b) Heterocyclic compound, (non-benzoid)

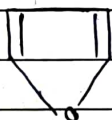
Cyclic compounds in which the ring atoms are made up of heteroatoms like nitrogen, oxygen and sulphur in addition to carbon atoms are called heterocyclic compound

e.g...

pyrrole



furan



Thiophene



pyridine



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* Nomenclature of organic compound →

General formula	Name	Functional group
1) R-H	Alkane	-
2) R-CH=CH ₂	Alkene	$\begin{array}{c} \diagup \quad \diagdown \\ \text{C} = \text{C} \\ \diagdown \quad \diagup \end{array}$
3) R-C≡C	Alkyne	-C≡C-
4) Ar-H	Arenes	
5) R-X	Halides	R-F, R-Cl, R-Br.
6) R-OH	alcohol	-OH
7) R-O-R'	ether	-O-
8) R-NH ₂	Amino	-NH ₂
9) R-SH	Thiol / Sulpha hydriol	-SH
10) R-S-R'	Sulphide.	-S-
11) R-CHO	Aldehyde	-CHO-

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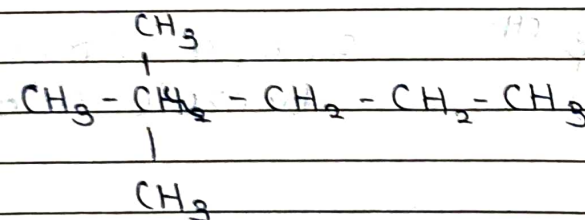
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12) $R-COO-R'$	ester	$-C(=O)-O-$
13) $R-C(=O)-R'$	ketone	$-C(=O)-$
14) $R-COOH$	carboxylic acid	$-C(=O)-OH$
15) $R-CO-NH_2$	amide / Carboxamide	$-C(=O)-NH_2$
16) $R-C\equiv N$	Nitrile / cyanide	$-C\equiv N$
17) $R-NO_2$	Nitro	$-NO_2$
18) $R-SO_2-OH$	Sulphonic acid	$-SO_2-OH$

* IUPAC Nomenclature System →

1) 2,2 Dimethyl pentane



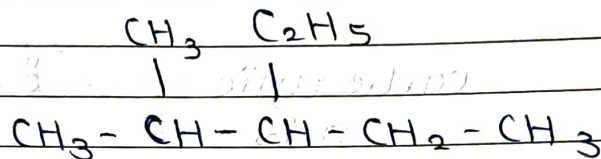
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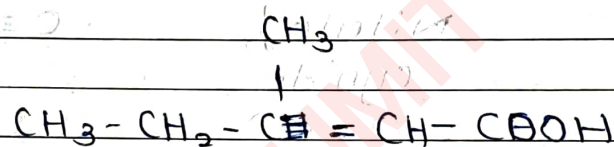
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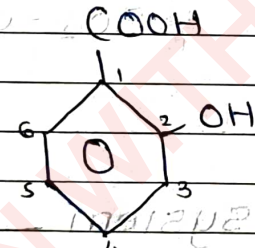
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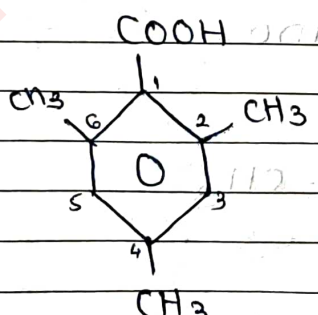
2) 3-ethyl, 2-methyl pentane



3) 3-methyl, 2-pentenoic acid



4)  2-hydroxy benzoic acid

5)  2, 4, 6 trimethyl benzoic acid

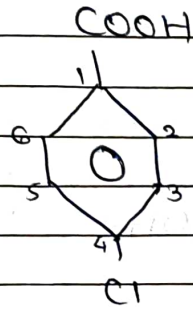
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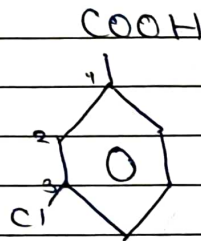
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6)



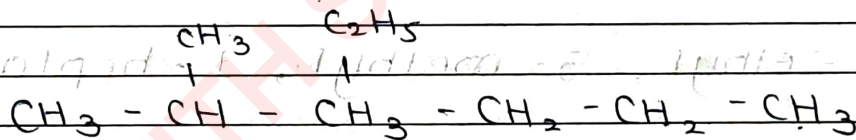
4-chloro-benzoic acid

7)



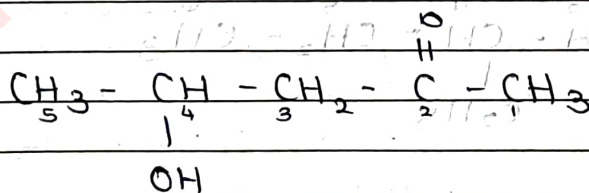
3-chloro-benzoic acid

8)



3-ethyl-2-methyl hexane

9)



4-hydroxy 2 pentanone

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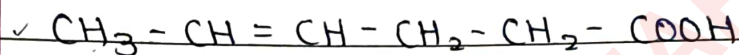
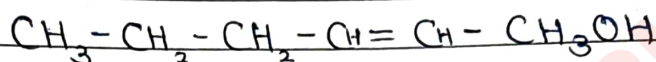
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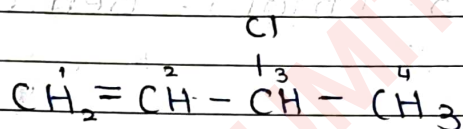
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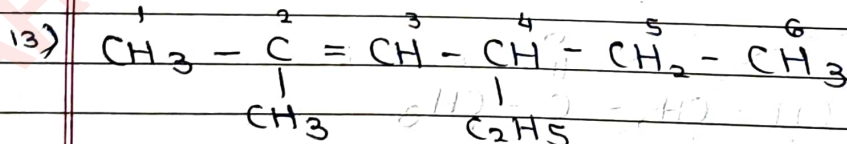
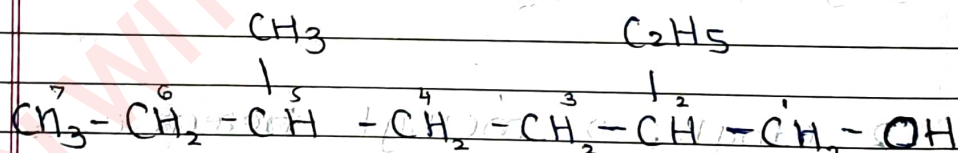
10) 4-hexenoic acid



11) 3-chloro 1-butene



12) 2-ethyl, 5-methyl, 1-heptanol



4-ethyl, 2-methyl-2-hexene

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Isomerism

The compounds which have same molecular formula but have different structural formula and different physical and chemical properties are called as isomers and phenomenon is known as isomerism.

It is classified into two types.

① Structural isomerism

or

Constitutional isomerism →

These are the compounds having same molecular formula but different structure.

It is subclassified into 5 types.

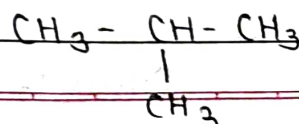
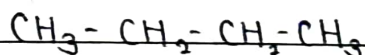
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② Chain isomerism →

Chain isomers have the same molecular formula but differ in the order in which the carbon atoms are bonded to each other e.g....

butane

Isobutane



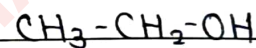
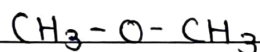
② Functional isomerism →

These isomers have the same molecular formula but differ in the nature of functional group.

e.g....

dimethyl ether

ethanol



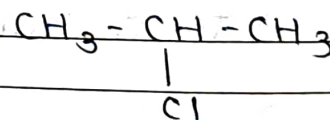
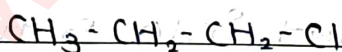
③ Positional isomerism →

Structural isomers having the same carbon skeleton but differ in the position of the functional group.

e.g....

1-chloropropane

2-chloropropane



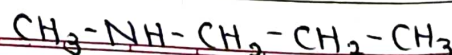
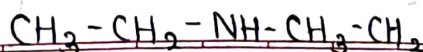
④ Metamerism →

It occurs due to the unequal distribution of carbon atoms on both sides of functional group.

e.g....

Diethyl amine

methyl propyl amine



⑤ Tautomerism

These are the isomers present in dynamic equilibrium with each other.

It is of two types

① keto-enol tautomerism

② Nitroaci tautomerism

① keto-enol tautomerism

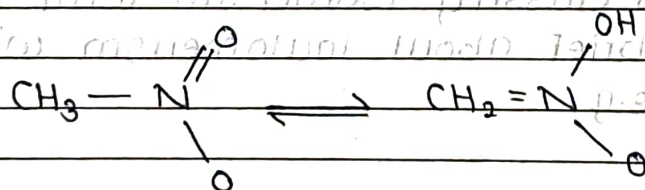


Acetone 1 propene - 2-ol
[keto form] [Enol-form]

Carbonyl compounds containing at least 1 α -hydrogen atom shows ketoenol tautomerism.

Carbonyl group can be converted into enol-form due to the transfer of 1 hydrogen on the oxygen atom

② Nitroaci-tautomerism



Nitromethane Aci-form
[Nitro form]

It is exhibited by nitrocompounds containing at least one hydrogen. H-atom is transferred from one atom to another during the conversion of nitro-form into aci-form.

③ Sterio-isomerism →

These are the compounds with same molecular formula but different arrangement of atoms in molecules.

It is of two types.

① Optical isomerism

② Geometrical isomerism

① Optical isomerism →

e.g... Dextro and leavo rotatory form

② Geometrical isomerism →

e.g... cis and trans isomerism

2 mark

Q 1) Define and classify organic comp. with e.g..

2 mark

Q 2) Define and classify isomerism with e.g..

2 mark

Q 3) write in brief about tautomerism with suitable e.g..