



ORGANIC CHEMISTRY

It is a branch of chemistry which involves detail study of carbon and its compound.

Organic chemistry is basically a life of chemistry.

Initially it is believed that organic compound can't be prepared in laboratory and it is found in animal and plants or living organism.

According to Berzelius, the compound which is made from living organism called organic compound.

Vital force theory: (given by Berzelius) organic compound only be derived from living organism and can't be synthesized by inorganic compound in laboratory.

After some time

WOHLER Prove that organic compound can also made by Inorganic material



(Ammonium cyanate) (Urea)

(Inorganic compound) (organic compound)

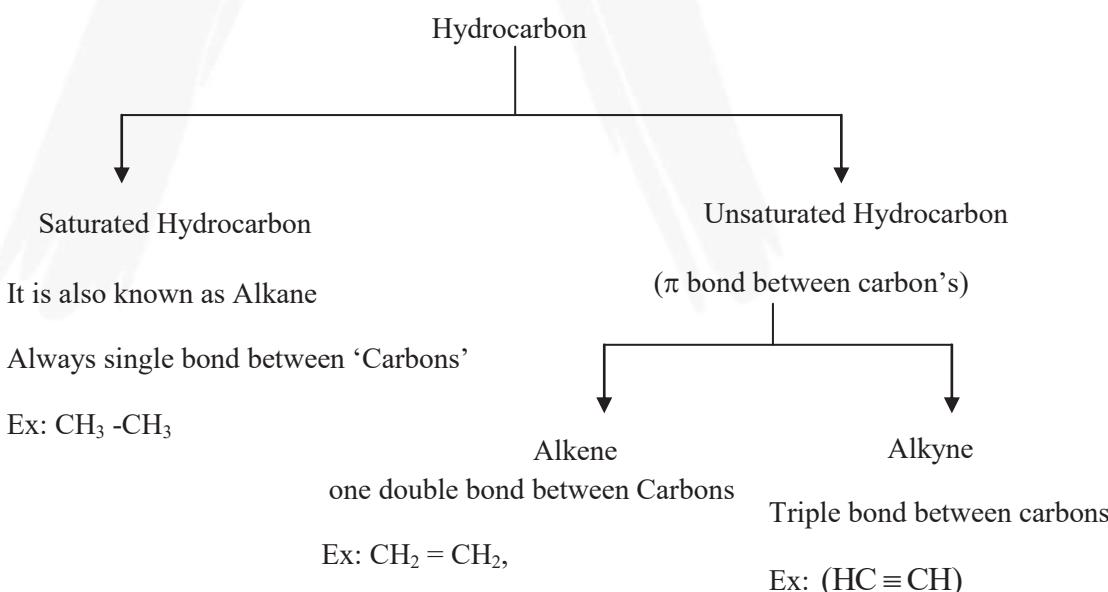
Many organic compound made from inorganic material so finally vital force theory was collapsed.

Modern Definition of Organic compound

Organic Compound: Hydrocarbon and their derivatives are known as organic compound.

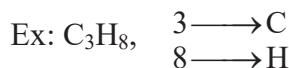
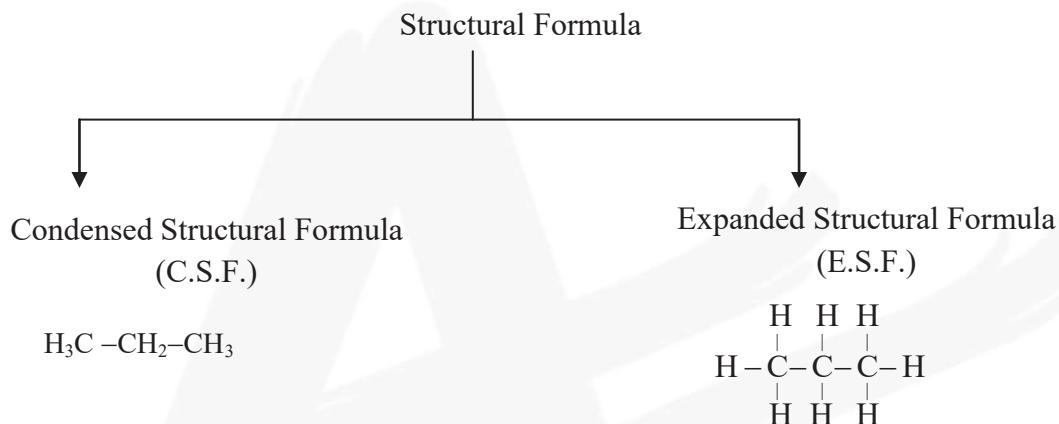
Hydrocarbon (H.C.): The compound which contain hydrogen (H) and carbon (C) or made of H and C called hydrocarbon.

CLASSIFICATION



(Organic Chemistry) Classification and Nomenclature**REPRESENTATION OF ORGANIC MOLECULES:****(1) Molecular Formula (M.F.):**

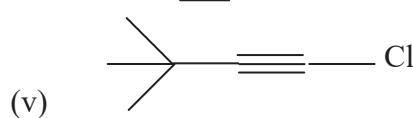
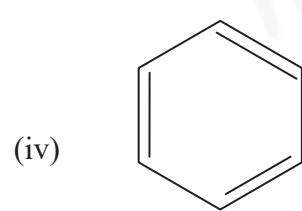
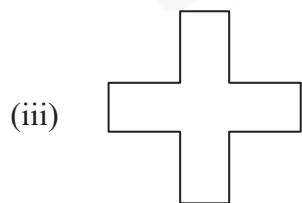
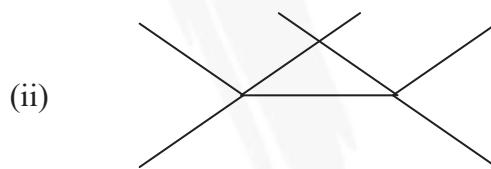
It gives information of number of atoms like (C, O, S, P etc.) in a compound.

**(2) Structural Formula:****(3) Bond Line Notation (B.L.N.):** Modern Technology to represent organic molecule.

Draw all bond except C–H bond.

DO YOURSELF – 1

Draw complete structural formula of following bond line notation



(Organic Chemistry) Classification and Nomenclature

DEGREE OF CARBON AND HYDROGEN

Types of carbon and hydrogen: There are four types of degree of carbon.

- (1) Primary carbon (1° C):- The carbon which is directly connected to only one 'C'.
- (2) Secondary carbon (2° C):- The carbon which is directly connected to two other 'C'.
- (3) Tertiary carbon (3° C):- The carbon which is directly connected to three other 'C'.
- (4) Quaternary carbon (4° C):- The carbon which is directly connected four other 'C'.

Note: (CH_4 - Super primary carbon)

Degree of Hydrogen

1° H (Primary Hydrogen) → The H present at 1° Carbon

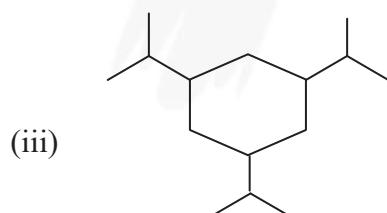
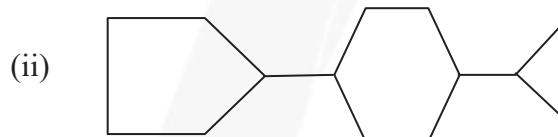
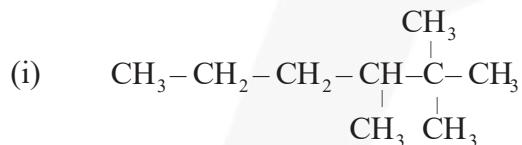
2° H (Secondary Hydrogen) → The H present at 2° Carbon

3° H (Tertiary Hydrogen) → The H present at 3° Carbon

4° H → Does not exist because 'Carbon' have no valancy for H.

DO YOURSELF – 2

Count the 1° , 2° , 3° & 4° carbon atoms

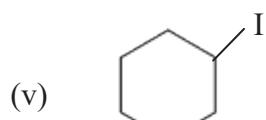
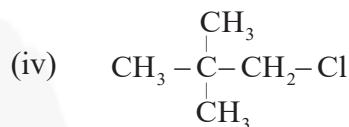
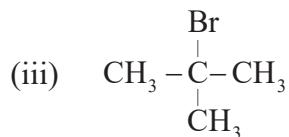
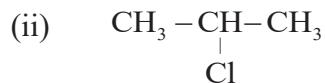


**DEGREE OF ALKYL HALIDE**

Degree of alkyl halide is determined by the degree of carbon containing Halogen atom.

DO YOURSELF – 3

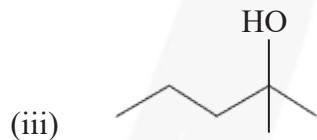
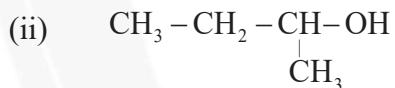
Define the degree of following alkyl halide

**DEGREE OF ALCOHOL**

Degree of alcohol is determined by the degree of carbon which contain ($-\text{OH}$) group.

DO YOURSELF – 4

Define the degree of following alcohol

**DEGREE OF AMINES**

1° amine (Primary Amine)



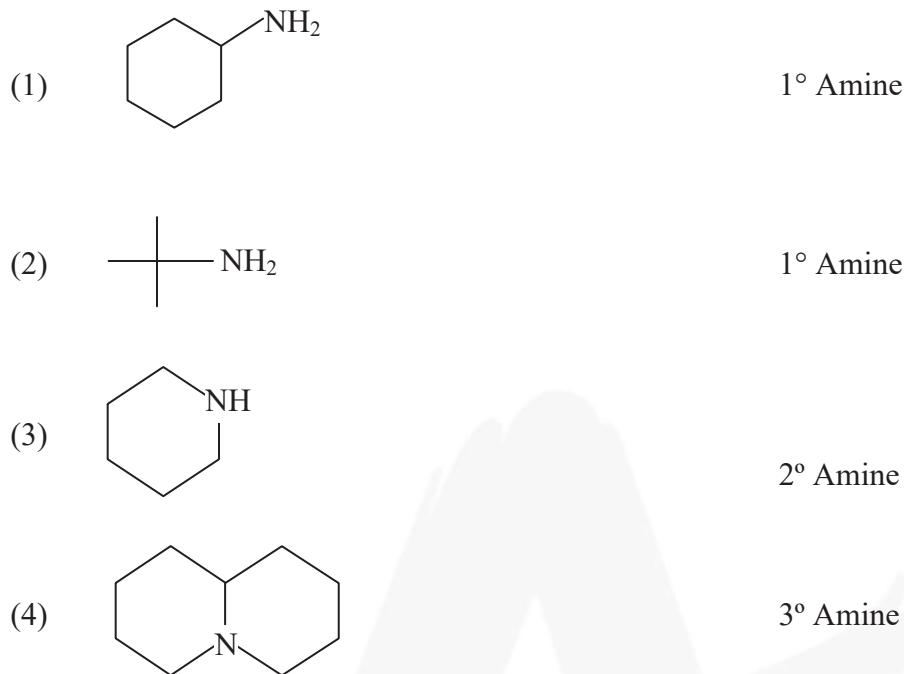
2° amine (Secondary Amine)



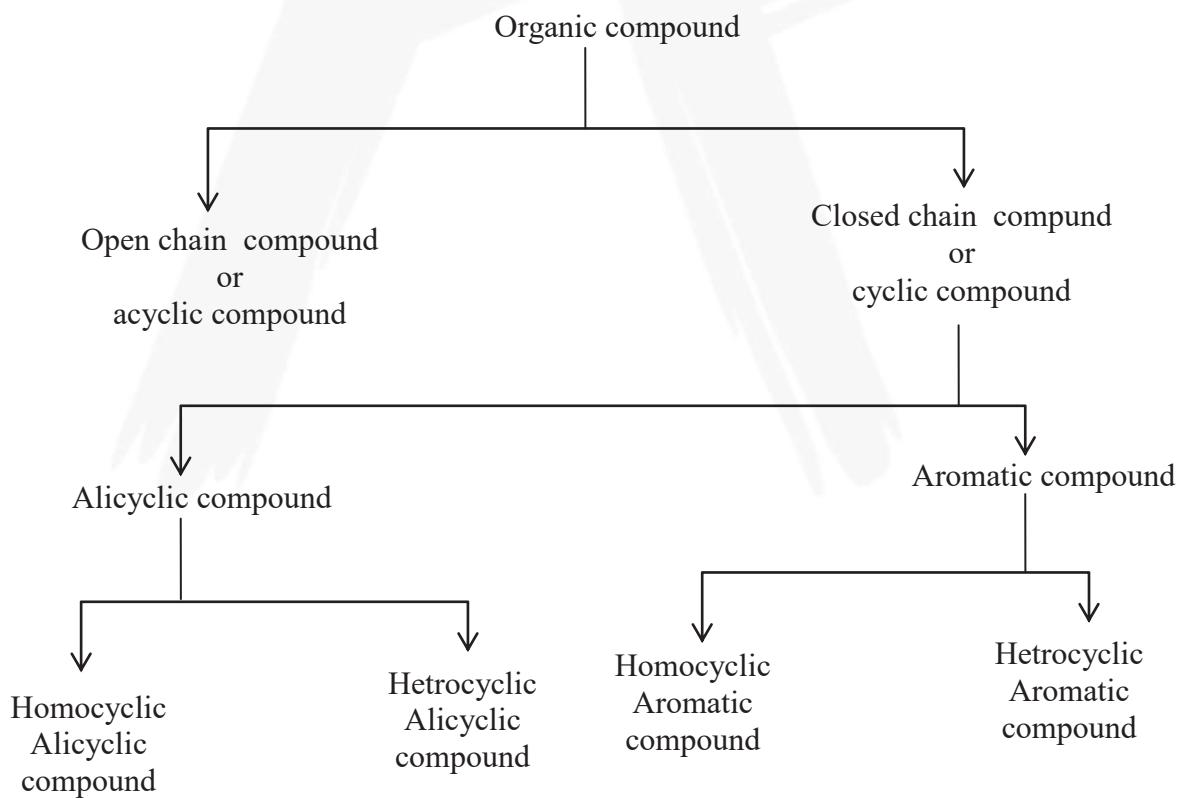
3° amine (Tertiary Amine)

(Organic Chemistry)

Classification and Nomenclature

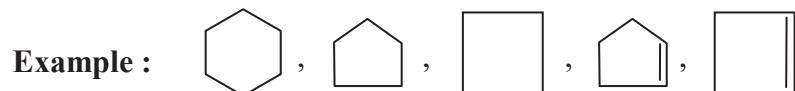


CLASSIFICATION OF ORGANIC COMPOUND



(Organic Chemistry) Classification and Nomenclature

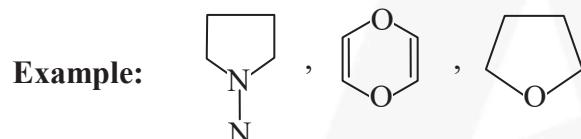
1. Alicyclic Compound :- The compound which is cyclic but not Aromatic known as alicyclic compound.



2. Homocyclic Compound :- When each member of the ring is Carbon Known as homocyclic compound



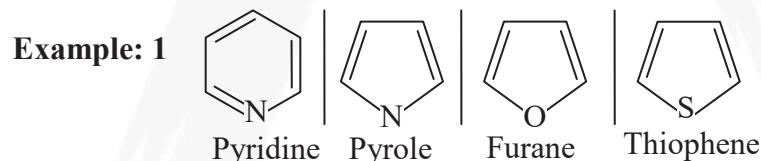
3. HETROCYCLIC ALICYCLIC:- When only one atom in a cyclic ring is hetroatom like O, P, S, N etc is known as Hetrocyclic compound.



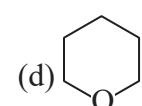
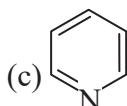
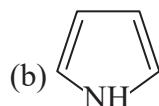
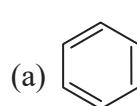
4. HOMOCYCLIC AROMATIC COMPOUND:- In a compound when ring is aromatic and all atoms in ring is carbon known as Homocyclic Aromatic Compound.



5. HETROCYCLIC AROMATIC COMPOUND:- In a compound when ring is aromatic but only one atom in a ring is other than carbon known as Hetrocyclic Aromatic Compound.



Example: 2. which one is Hetrocyclic Alicyclic compound ?



Ans. (d)



(Organic Chemistry) Classification and Nomenclature

DOUBLE BOND EQUIVALENT (DBE) OR DEGREE OF UNSATURATION (DU) OR INDEX OF HYDROGEN DEFICIENCY (I.H.D.)

→ It is defined as the number of moles of hydrogen required to make an unsaturated compound to saturated or to convert a cyclic structure into a cyclic structure (open chain structure) is known as degree of unsaturated.

Alkane (G.F.) → $C_n H_{2n+2}$ [full of H so saturated]

Alkene (G.F.) → $C_n H_{2n}$ [Deficiency of 2H unsaturated]

D.B.E = 1

Alkyne (G.F.) → $C_n H_{2n-2}$ [Deficiency of 4H unsaturated]

Note :-

- (1) Each double bond ($C = C$, $C = O$, $C = N$) D.B.E = 1
- (2) Each triple bond ($C \equiv C$, $C \equiv N$) D.B.E = 2
- (3) Each Ring (\triangle \bigcirc \bigtriangleup \square ) D.B.E = 1

CALCULATION OF D.B.E

- (1) If structure is given

$$DU = \text{No of } \Pi \text{ bond} + \text{No. of ring}$$

- (2) If Molecular formula is given

$$DU = (C + 1) - \left(\frac{H + X - N}{2} \right)$$

Where C → Number of carbon atom

H → Number of Hydrogen atom

X → Number of Halogen atom

N → Number of Nitrogen atom

Note : – (i) Divalent atom neglected, Monovalent atom added, trivalent atom subtract.

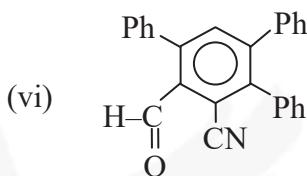
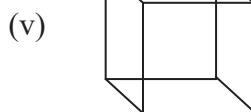
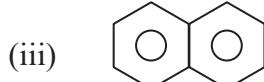
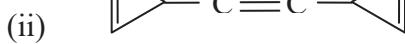
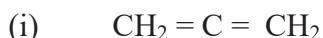
(ii) No. of oxygen and sulphur are neglect.



(Organic Chemistry)

Classification and Nomenclature**DO YOURSELF – 5**

Define the double bond equivalent of following compounds



Q. write all possibilities for a compound having D.B.E = 3

Ans. 6

Case- (i) When three double bond present .

(ii) When one triple bond end one double bond.

(iii) When three ring.

(iv) Two ring and 1 double bond.

(v) 1 ring & 2 double bond

(vi) 1 ring & one triple.

IUPAC (INTERNATIONAL UNION OF PURE & APPLIED CHEMISTRY)

It is International Scientific Organization.

FUNCTIONAL GROUP

The atom or groups of atoms which explained the property of whole compound is called functional group.

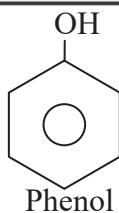


(Organic Chemistry) Classification and Nomenclature

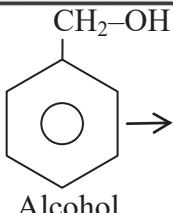
A functional group is the part of molecule where most of its chemical reaction occur.

Sr. No	NAME	STRUCTURE	PREFIX	SUFFIX	SPEC. SULFIX
1	Carboxylic Acid	$\begin{matrix} \text{O} \\ \\ \text{R}-\text{C}-\text{OH} \end{matrix}$	Carboxy	Oic Acid	Carboxylic Acid
2	Sulphonic Acid	$\begin{matrix} \text{O} \\ \\ \text{R}-\text{S}-\text{OH} \\ \\ \text{O} \end{matrix}$	Sulpho	Sulphonic acid	
3	Carboxylic acid anhydride	$\begin{matrix} \text{O} & \text{O} \\ & \\ -\text{C}-\text{O}-\text{C}- \end{matrix}$		-oic anhydride	
4	Ester	$\begin{matrix} \text{O} \\ \\ \text{R}-\text{C}-\text{O}-\text{R}' \\ \text{R}' \neq \text{H} \end{matrix}$	$\begin{matrix} \text{O} \\ \\ \text{R}-\text{C}-\text{O}-\text{PC} \\ \text{Alkonyloxy} \end{matrix}$ $\begin{matrix} \text{O} \\ \\ \text{PC}-\text{C}-\text{O}-\text{R}' \\ \text{Alkoxy carbonyl} \end{matrix}$	-Oate	Carboxylate
5	Acid Halide	$\begin{matrix} \text{O} \\ \\ -\text{C}-\text{X} \end{matrix}$	Halocarbonyl	-Oyl halide	Carbonyl Halide
6	Acid amide	$\begin{matrix} \text{O} \\ \\ \text{R}-\text{C}-\text{NH}_2 \\ \text{all } \text{I}, 2 \text{ & } 3^\circ \end{matrix}$	Carbamoyl	Amide	Carboxamide
7	Cyanide	$-\text{C}\equiv\text{N}$	Cyano	Nitrile	Carbonitrile
8	Isocyanide	R-NC	Isocyano	Isonitrile	
9	Aldehyde	$\begin{matrix} \text{O} \\ \\ -\text{C}-\text{H} \end{matrix}$	Formyl or oxo	-al	Carbaldehyde
10	Ketone	$\begin{matrix} \text{O} \\ \\ \text{R}-\text{C}-\text{R}' \\ \text{R & R}' \neq \text{H} \end{matrix}$	Oxo	One	
11	Alcohol	-OH	Hydroxy	ol	
12	Thioalcohol	-SH	Mercapto	thiol	
13	Amine	$\begin{matrix} -\text{NH}_2 \\ 1^\circ \\ \text{R}-\text{O}-\text{R}' \end{matrix}$	Amino	Amine	
14	Ether	$\begin{matrix} \text{R} \neq \text{H}, \text{R}' \neq \text{H} \\ \text{CH}_3-\text{O}-\text{CH}_3 \end{matrix}$	OXY	Ane	
15	Nitro	R-NO ₂	Nitro	Ane	
16	Nitrite	R-ONO	Nitrito		
17	Halide	R-X	Halo	Ane	

- Note :-** (i) Primary, Secondary and tertiary amine are different functional group.
(ii) Primary, Secondary and tertiary acid amide also different functional group.
(iii) Phenol & alcohol are two different functional group.



\rightarrow OH is directly connected to benzene

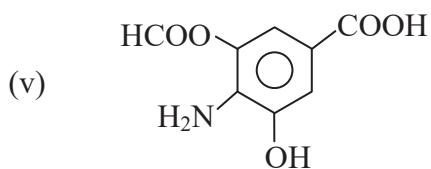
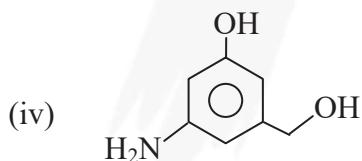
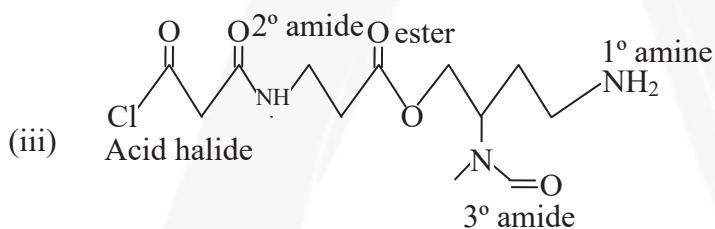
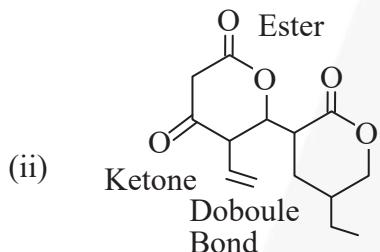
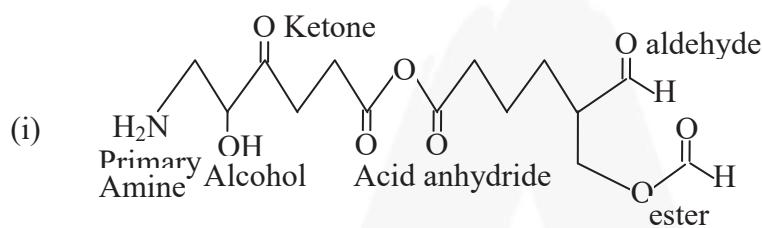


\rightarrow OH is not directly connected

(iv) Double and triple bonds are different functional group.

DO YOURSELF – 6

Total number of different functional group?



**HOMOLOGOUS SERIES**

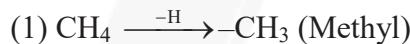
A series of organic compound which can be represented by same general formula, containing same functional group Known as Homologous series.

CHARACTERISTIC :

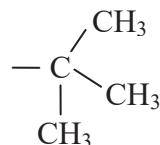
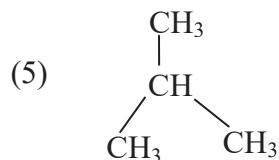
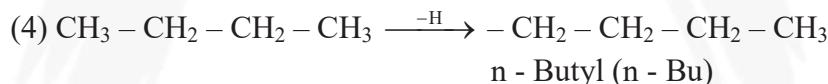
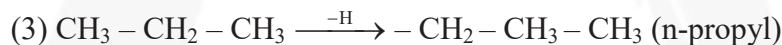
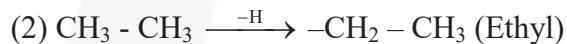
- (i) Two consecutive member of homologous series differ by -CH₂ group (14gm)
- (ii) Homologous series must have same functional group.
- (iii) Must have same general formula.
- (iv) Two consecutive member differ in molecular weight by 14 unit.
- (v) H.S have similar chemical property (Due to same functional group).
- (vi) H.S have similar physical property (Molecular wt.)

Example : -

- (1) Alkane CH₃ – CH₃ & CH₃ – CH₂ – CH₃ are homologous series
- (2) Alkene C₂H₄ & C₃H₆ a homologous series
- (3) Alkyne C₂H₂ & C₃H₄ are homologous series
- (4) Alcohol CH₃ – OH & CH₃ – CH₂ – OH are homologous series

FEW ALKYL GROUP

Methane (Marsh gas)



t – Butyl

RETAINED NAME

n - (normal) → straight c-atom (No branching)

c - c - c - c - c n - pentane

c - c - c - c - c n - hexane

(Organic Chemistry) Classification and Nomenclature

Iso - 2 - Methyl is the only branch, No other branching

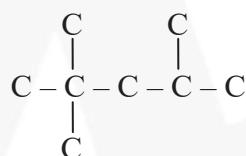
total no. of carbon = 4 to 7

Compound	Retained Name
(1) $\begin{array}{c} \text{C} - \text{C} - \text{C} \\ \\ \text{C} \end{array}$	Isobutane

(2) $\begin{array}{c} \text{C} - \text{C} - \text{C} - \text{C} \\ | \\ \text{C} \end{array}$ Isopentane

$$(3) \quad \begin{array}{c} \text{C} - \text{C} - \text{C} - \text{C} - \text{C} \\ | \\ \text{C} \end{array} \quad \text{Isohexane}$$

Exception : Isooctane



NEO - 2,2 - dimethyl branches (No other branching)

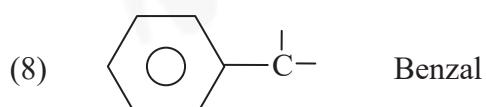
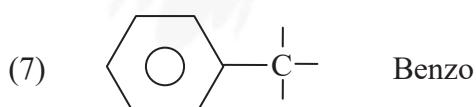
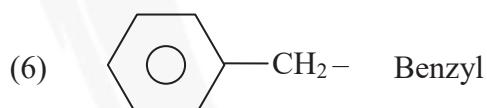
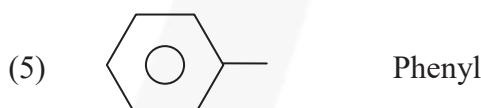
No of carbon = 5 to 7

(1) 

(2)  Neohexane

(3) $\text{CH}_2 = \text{CH} -$ Viny

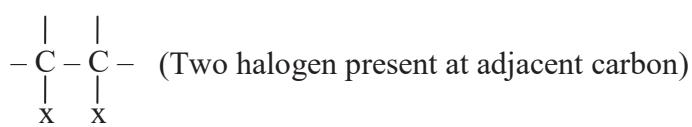
(4) $\text{CH}_2 = \text{CH} - \text{CH}_2 -$ Allyl



Geminal (gem) :



Vicinal (vic) :



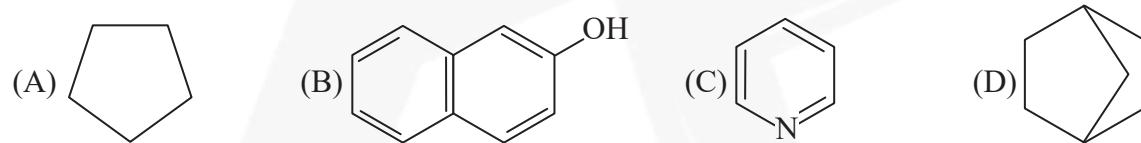
(Organic Chemistry) Classification and Nomenclature

Example-1

	Compound	Properties
(A)		(P) Homocyclic Hydrocarbon
(B)		(Q) Even no. of D.B.E
(C)		(S) Homocyclic Compound
(D)		(T) Odd number of D.B.E

Ans. (A) → P,T,S; (B) → Q,S; (C) → T,S; (D) → P,Q,S

Example -2 Which one of the following is/are homocyclic compound ?



Ans. A,B,D

M.F.	Isomer		alkyl group
(1) CH ₄	CH ₄	$\xrightarrow{-H}$	-CH ₃ (Me)
(2) C ₂ H ₆	CH ₃ -CH ₃	$\xrightarrow{-H}$	-CH ₂ -CH ₃ (Et)
(3) C ₃ H ₈	CH ₃ -CH ₂ -CH ₃	$\xrightarrow{-H}$	-CH ₂ -CH ₂ -CH ₃ (n - propyl) - CH - CH ₃ (Isopropyl) CH ₃
(4) C ₄ H ₁₀	CH ₃ -CH ₂ -CH ₂ -CH ₃	$\xrightarrow{-H}$	-C-C-C-C (n - Butyl)

Note : - The straight chain alkanes are called normal alkane.

Name of organic compound :-

- | | |
|--------------------|-------------------|
| (i) Common name | (ii) Trivial name |
| (iii) Derived name | (iv) IUPAC name |



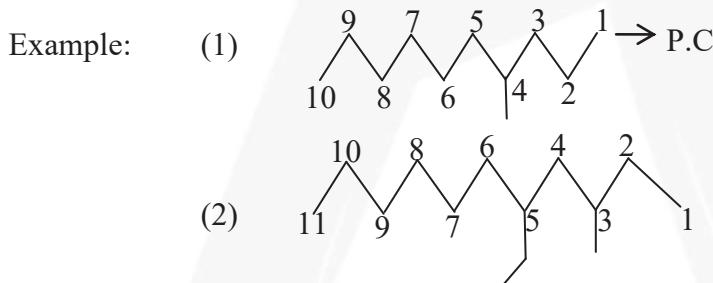
(Organic Chemistry) Classification and Nomenclature

IUPAC
SCHEME

2° PREFIX - 1° PREFIX - WORD ROOT - 1° SUFFIX - 2° SUFFIX

Word Root → It is used to explain number of carbon atom in principal or parent chain.

No. of Carbon atom	word root
1	Meth
2	Eth
3	Prop
4	But
5	Pent
6	Hex
7	Hept
8	Oct
9	Non
10	Dec
11	Undec
12	Dodec

PARENT CHAIN : Longest possible carbon chain is called parent chain and the number of carbon present in the Parent chain is known as word root.**Secondary suffix :** It is use for senior most functional group present in parent chain.**Primary suffix :** It gives information about Saturation or unstauration of the compound.

- Example:
- for all single bond → ane
 - for one double bond → ene
 - for one triple bond → yne

- Note : -
- (i) It always written in alphabetical order.
 - (ii) Always written with position.

In the compound	i suffix
(i) all c – c bond	ane
(ii) one c = c bond	ane
(iii) two c = c bond	diene
(iv) three c = c bond	triene
(v) one c ≡ c bond	yne
(vi) two c ≡ c bond	diyne
(vii) one c = c + one c ≡ c	enyne

(Organic Chemistry) Classification and Nomenclature

Primary prefix (i) :- It gives the information about cyclic or acyclic nature of compound.

If compound has

		1° prefix
(i)	Open chain or acyclic	No prefix
(ii)	One ring or cyclic	cyclo
(iii)	Two ring	Bicyclo
(iv)	Spiro	Spiro

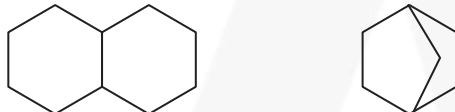
Spiro compound : Spiro compounds are that compound In which exactly one atom is common between two ring.

Example :



Bicyclo compound : - The compound which contain atleast 2 common atom between two rings.

Example :



Secondary prefix (2°) :- It is always use to naming of side chain, substituent .

Example:	- Cl	→	chloro	- NO ₂ → Nitro
	- Br	→	Bromo	- CH ₃ → Methyl
	- I	→	Iodo	- CH ₂ - CH ₃ → Ethyl
	- F	→	Fluro	- N=O → Nitroso
	- OH	→	Hydroxy	

Note :- (i) Always written in alphabetical order.

(ii) Always written with their position.

(iii) If repetition of side chain then use

2 - di 3 → Tri 4 → tetra 5 → penta

(iv) If side chain is complex and already contain Di. Tri. etc. then in case of repetition of such side chain use

Di → Bis Tri → Tris Tetra → Tetrakis Penta → Pentakis

Note :- (i) CH₂ = CH - CH₂ - CH = CH₂ → Isolated alkadiene

(ii) CH₂ = CH - CH = CH₂ Alternate bond → Conjugated alkadiene

(iii) CH₂ = C = CH₂ Continous band → Cummulated alkadiene

(Organic Chemistry) Classification and Nomenclature

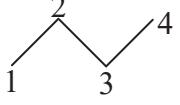
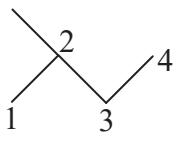
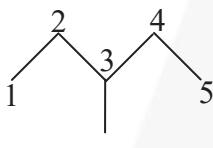
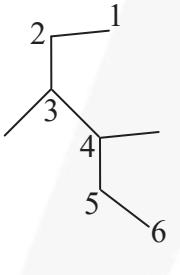
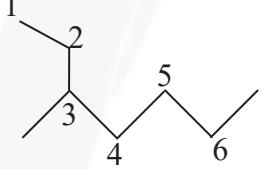
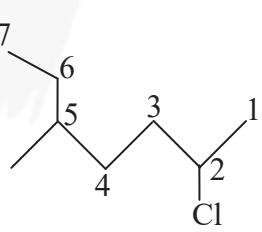
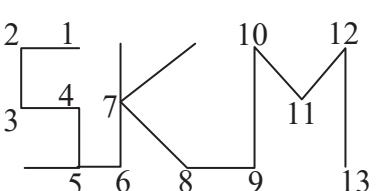
RULES FOR SELECTION OF CHAIN

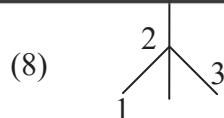
(1) Functional Group → Multiple bond → Side chain

Select principal chain according to following order Functional > Multiple > Substitution.

In absence of functional group and multiple bond then always select longest chain.

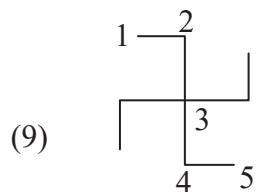
No. of carbon in Parent chain IUPAC

(1)		4	Normal-butane
(2)		4	2-methyl butane
(3)		5	3-methyl pentane
(4)		4	3,4-diamethyl hexane
(5)		7	3-methyl heptane
(6)		7	2-chloro-5-methylheptane
(7)		13	5,7,7-trimethyl tridecane



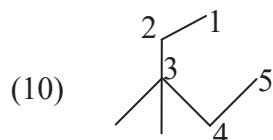
5

2,2-dimethyl propane



5

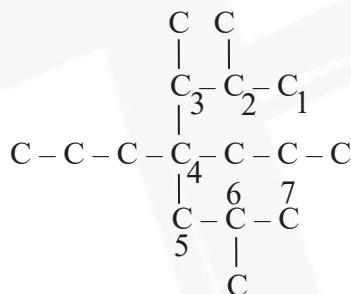
3,3-diethyl pentane



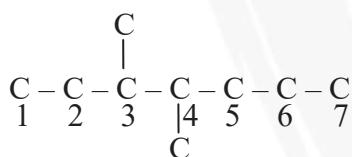
5

3,3-dimethyl pentane

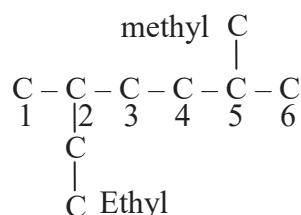
- Note : (I) Locants : The number that define the positions of the principal functional group and substituent is called locants.
- (II) If two or more longest carbon chain have equal number of carbon atoms, then select that chain which have greater number of branching.



- (III) If two or more than two substitutent are present in the compound then apply lowest locant Rule:



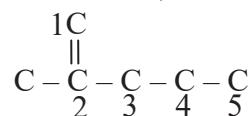
- (iv) If two different substituents are present in the compound of the same position from the opposite end then select their alphabet which near to that end.



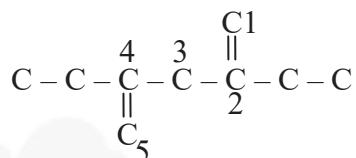
Note:- The name of the substituents are written in alphabetical order, prefix and position number of the substituent are separated by hyphen (-)

(Organic Chemistry) Classification and Nomenclature

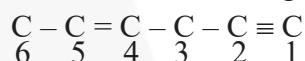
- (v) If double or triple bond present in the compound then main chain select in such a way that double or triple bond Included in main chain. (Parent Chain may or may not be longest)



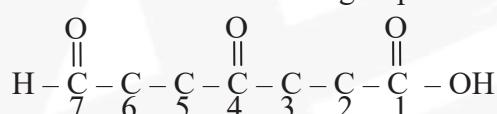
- (vi) If double or triple bond present in the compound at different position from opposite end then select that end which is nearest to double or triple bond.



- (vii) If two or more different functional groups are present in the compound then numbering of carbon atom will be start from most senior functional group.



- (viii) If two or more different functional groups are present in the compound then numbering of carbon atom will start from most senior functional group.

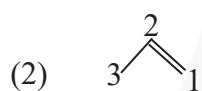


(11) CClBrFI BromochlorofluoroIodomethane

NAMING OF ALKENES
COMPOUND
IUPAC

(1) $2=1$

ethene



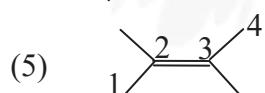
Propene



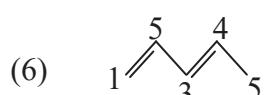
But - 1 - ene

(4)

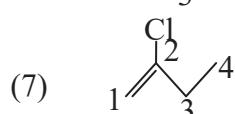
But - 2 - ene



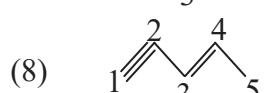
2, 3 - dimethyl but - 2 - ene



Penta - 1, 3 - diene



2 - chloro - but - 1 - ene



Pent - 3 - ene - 1 - yne

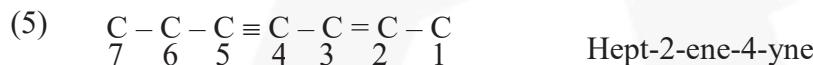
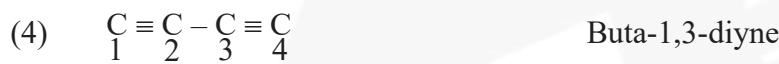
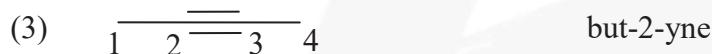
ALKYLIDENE SUBSTITUENTS :

Parent Chain—CH₃ methyl

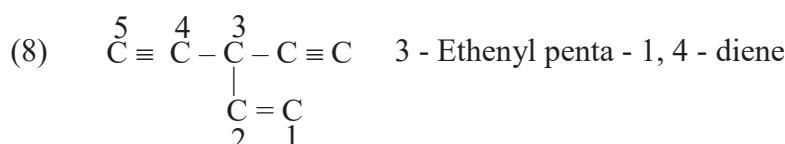
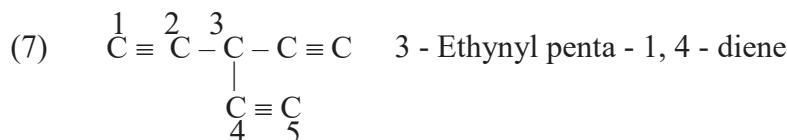
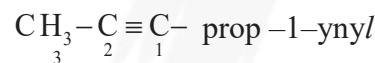
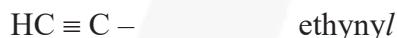
Parent Chain—CH₂ ylidene (methyldene)

Parent Chain—CH—CH₃ Ethylidene

Parent Chain—CH—CH₂—CH₃ → (Propylidene)

**NAMING OF ALKYNES**

Note :- If the molecule have only one possible structure then locant are avoided.

ALKYNYL SUBSTITUENTS

(Organic Chemistry) Classification and Nomenclature



NAMING OF CYCLOALKANES



Cyclopropane



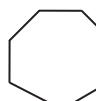
Cyclobutane



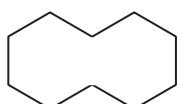
Cyclopentane



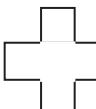
Cyclohexane



Cycloheptane



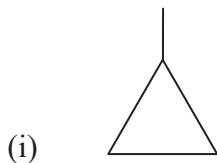
Cyclodecane



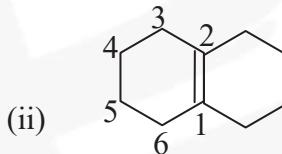
Cyclododecane

DO YOURSELF – 7

Write IUPAC names of following compounds ?

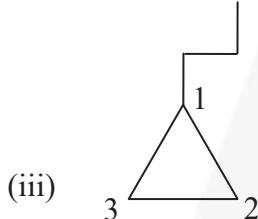


(i)



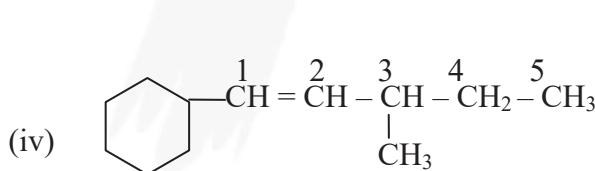
(ii)

Hint : If the equal number of carbon atom present in the open chain & closed chain then the ring will be preferred.

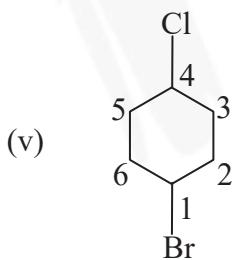


(iii)

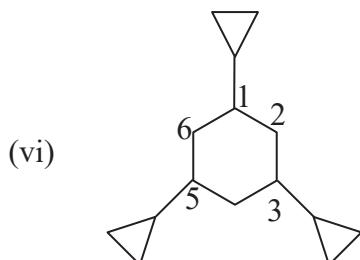
Hint :- If equal number of carbon atom present in open chain & closed chain and open chain have any functional group Multiple Bond or Substituent then prefer open chain.



(iv)



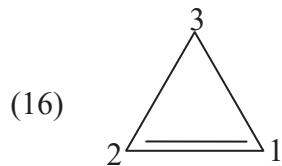
(v)



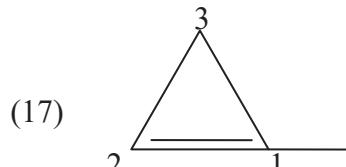
(vi)

NAMING OF CYCLOALKENES

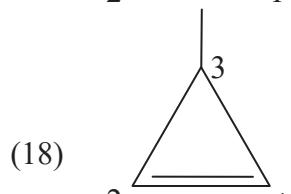
Note:- C = C must be give 1 and 2 position



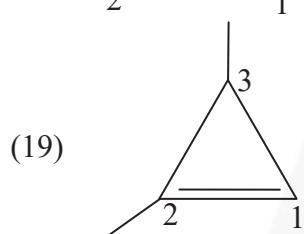
cyclopropene



1-methyl cycloprop-1-ene



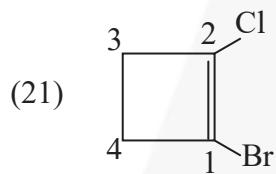
3 - methyl cycloprop-1-ene



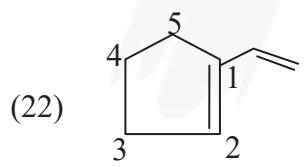
2,3-dimethyl cycloprop-1-ene



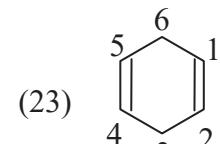
cyclobutene



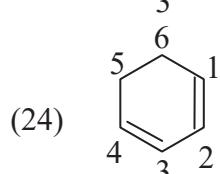
1 - bromo-2-chloro cyclobut-1-ene



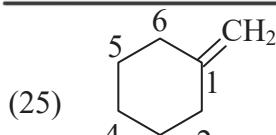
1 - ethenyl cyclopent-1-ene



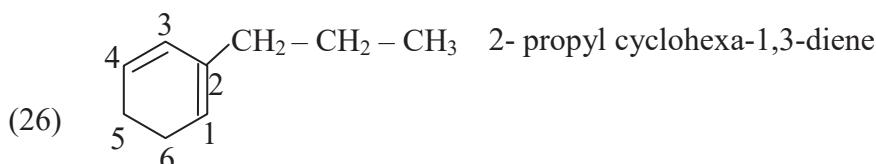
cyclohexa - 1,4-diene



cyclohexa - 1,3-diene



1-methylidene cyclohexane

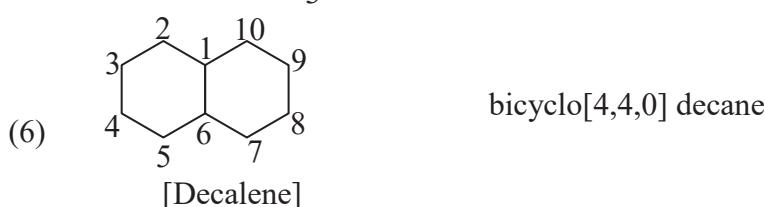
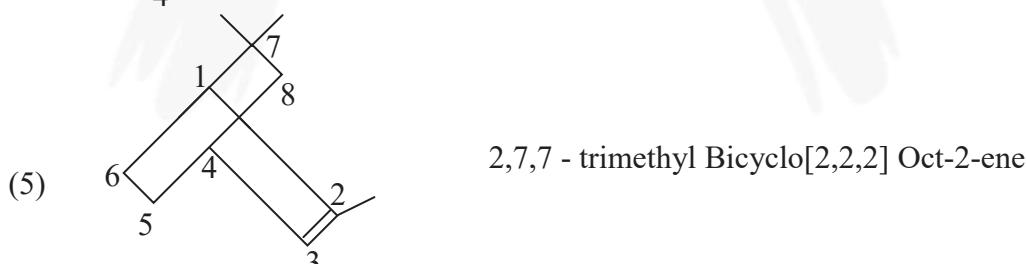
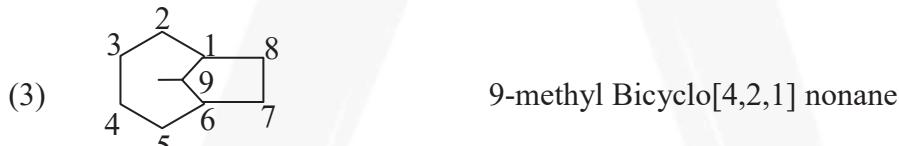
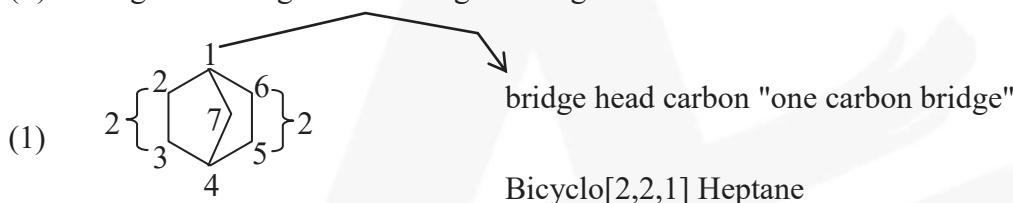


2-propyl cyclohexa-1,3-diene

NAMING OF BICYCLO COMPOUND

If two rings are fused at two common carbon atoms then compound are known as Bicyclic Compound.

- (i) Numbering always start with bridge head centre.
- (ii) During numbering move on largest → larger → smaller



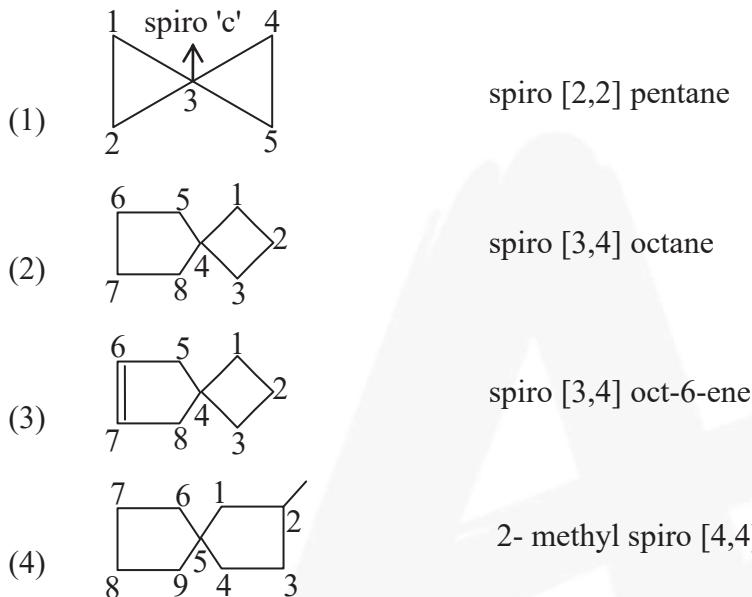
(Organic Chemistry) Classification and Nomenclature

NAMING OF SPIRO COMPOUND

Spiro Compound:- only one carbon common in two ring called spiro compound

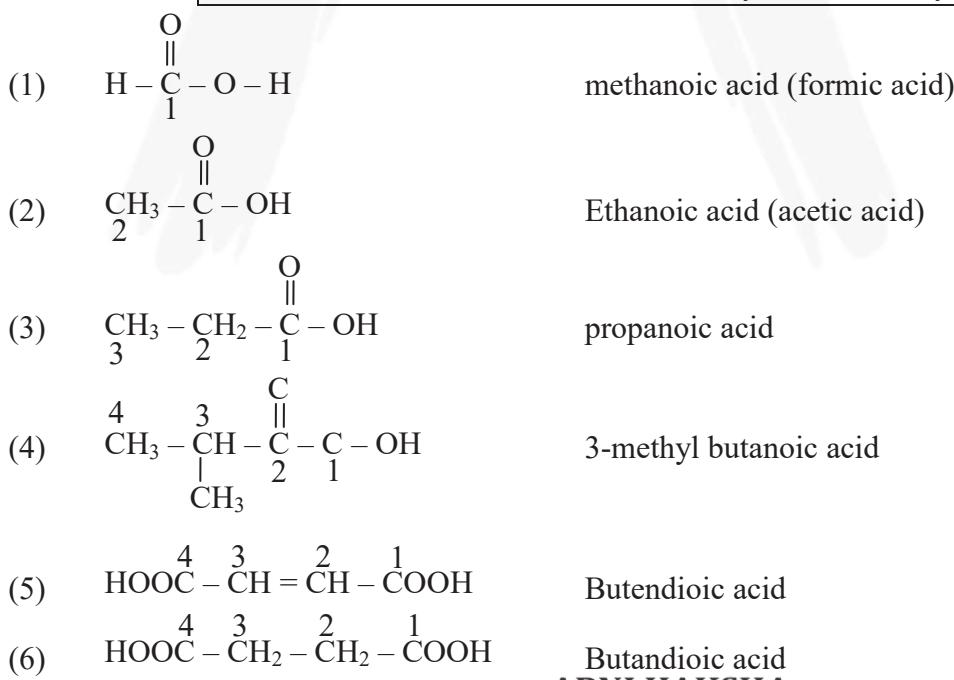
Rule :-

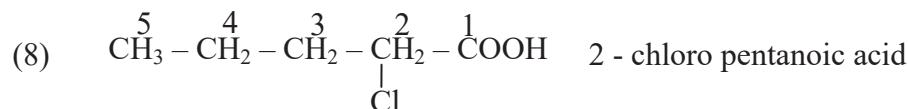
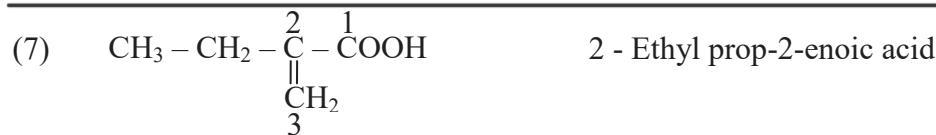
- (i) Numbering start with smaller ring which is directly attached to spiro carbon and move toward larger ring.



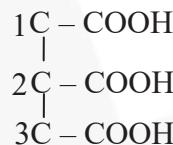
NAMING OF CARBOXYLIC ACID

F.G	Suffix	Prefix	Special suffix
-COOH	oic acid	carboxy	carboxylic acid



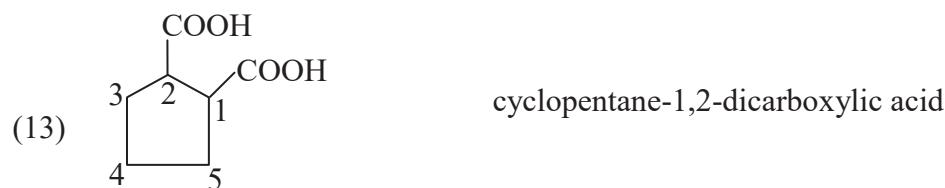
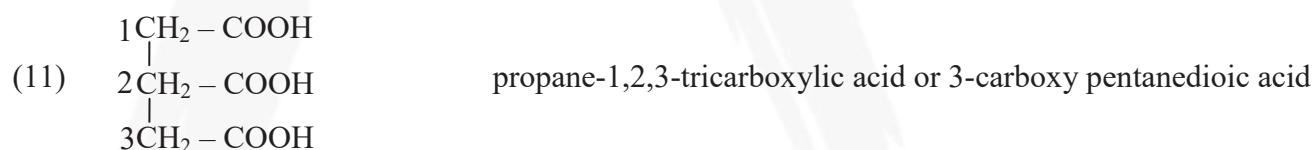
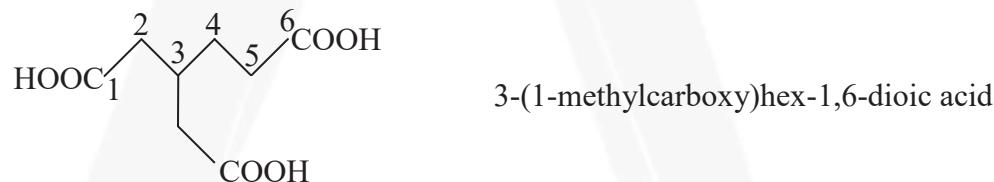
(Organic Chemistry) Classification and Nomenclature**SPECIAL NAME**

- (i) If there are more than 2 same functional group are present as senior functional group then select a chain in which all the senior functional group are directly connected and use their special suffix name



Propane-1,2,3-tricarboxylic acid

- (ii) If senior functional group are not directly connected to principal chain then select the chain having maximum number of senior functional group & skip any senior functional group.
- (iii) For skipped senior functional group use prefix and for selected senior functional group use suffix





(Organic Chemistry) Classification and Nomenclature

NAMING OF SULPHONIC ACID

F.G -SO ₃ H	Suffix -Sulphonic acid	prefix -sulpho
---------------------------	---------------------------	-------------------

Rule:- Alkane + Sulphonic acid → alkanesulphonic acid



DICARBOXYLIC ACID

G.F HOOC - (CH₂)_n-COOH

n =	0	1	2	3	4	5	6
	O	M	S	G	A	P	S
	↓	↓	↓	↓	↓	↓	↓

Oxalic Malonic Succinic Glutaric Adipic Pinelic Suberic
acid acid acid acid acid acid acid

Exam. When n = 0 HOOC – COOH Oxalic Acid

When n = 1 HOOC – CH₂ – COOH Malonic acid+

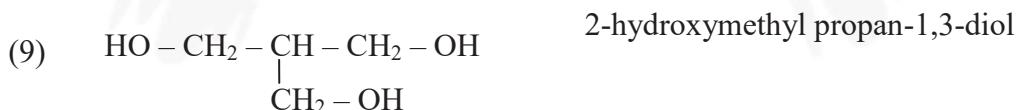
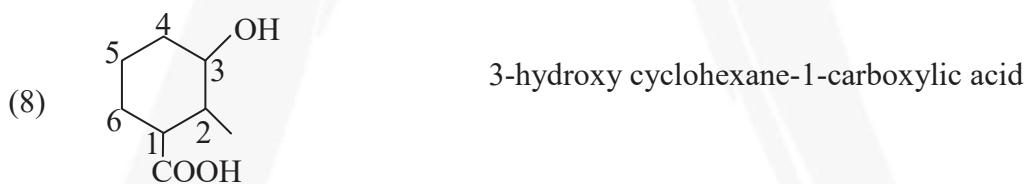
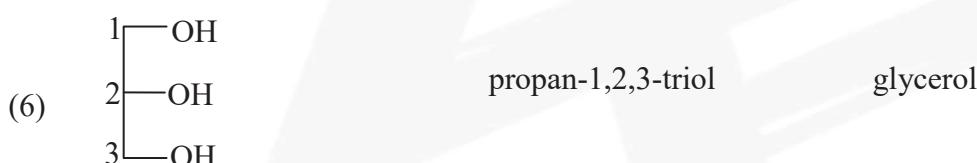
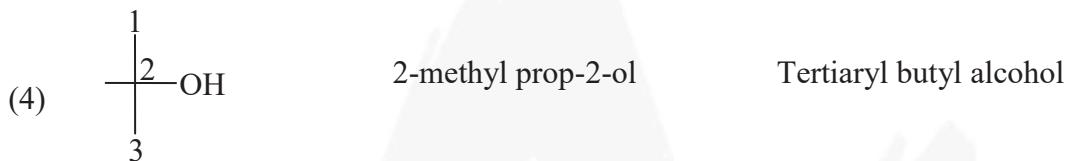
When n = 6 HOOC – (CH₂)₆ – COOH Suberic acid



F.G	Suffix	Prefix
-OH	-ol	-Hydroxy

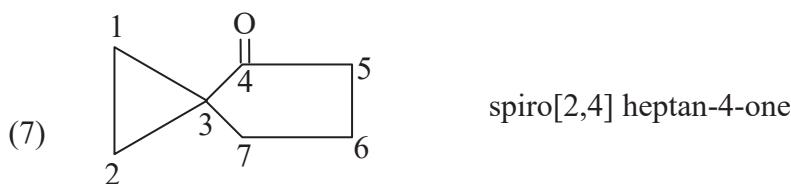
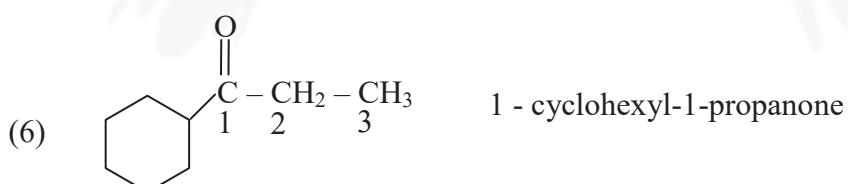
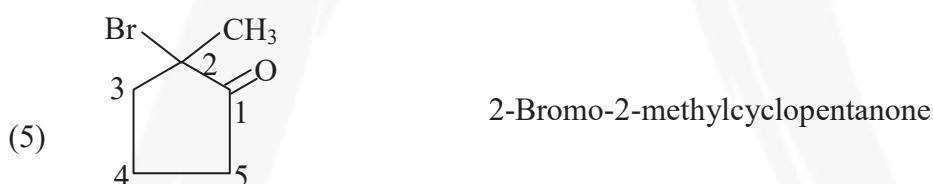
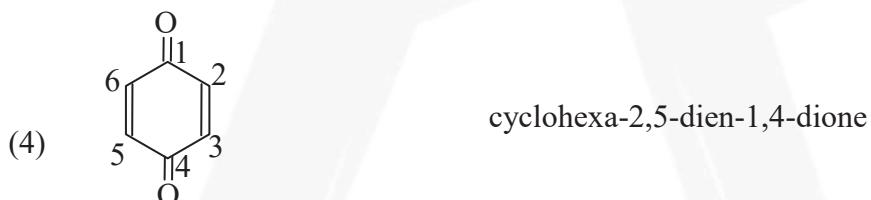
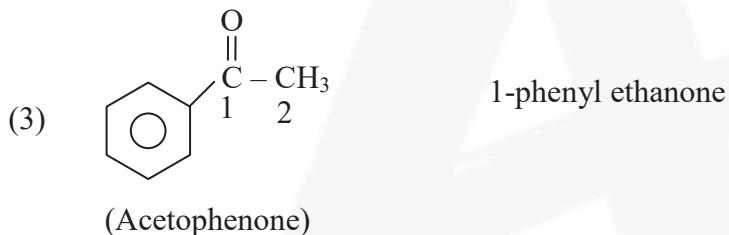
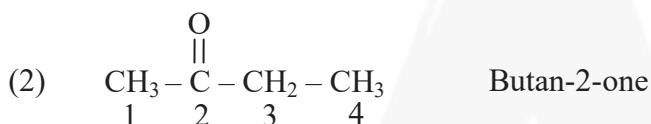
Rule: Alkane + ol \rightarrow Alkanol

- | | | | |
|-----|---|----------|---------------|
| (1) | CH_3OH | Methanol | Methylalcohol |
| (2) | $\text{CH}_3-\text{CH}_2-\text{OH}$ | Ethanol | Ethylalcohol |
| (3) | $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$ | Propanol | |



NAMING OF KETONE

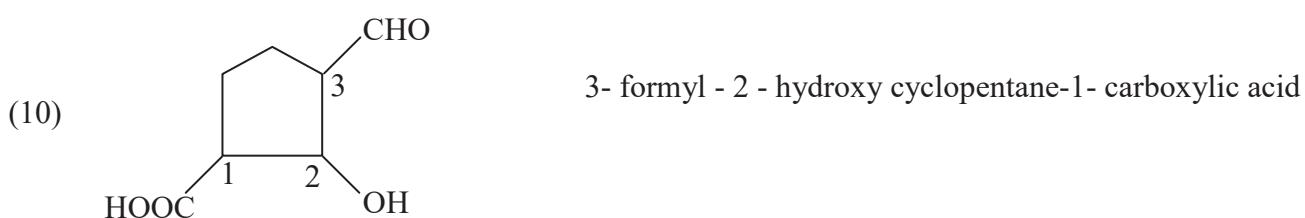
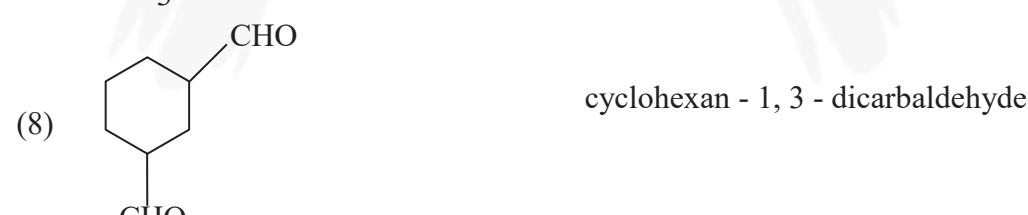
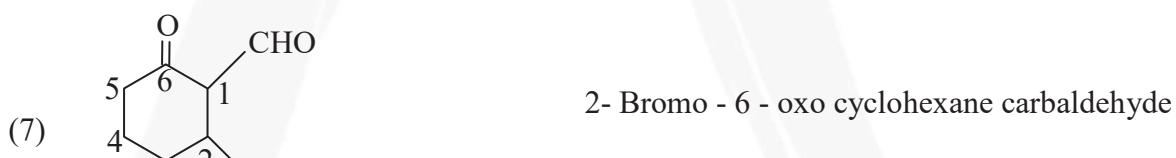
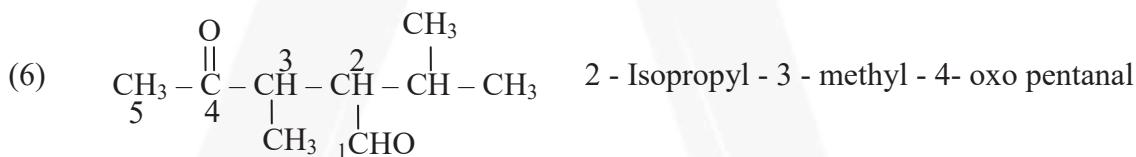
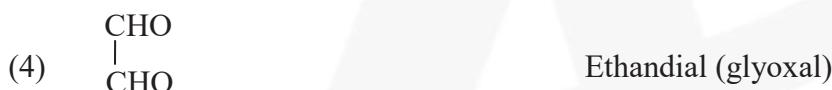
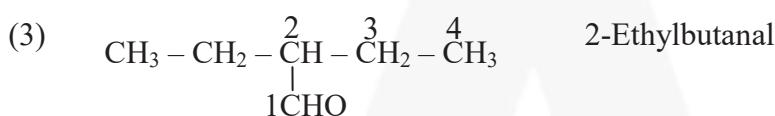
F.G.	Suffix	Prefix
$\begin{array}{c} \text{R}-\text{C}-\text{R}' \\ \parallel \\ \text{O} \end{array}$	-one	Keto or oxo

Rule:- Alkane + one \rightarrow Alkanone Common Name

NAMING OF ALDEHYDE

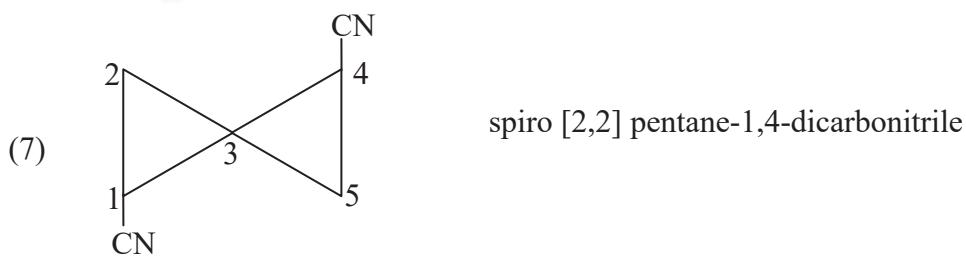
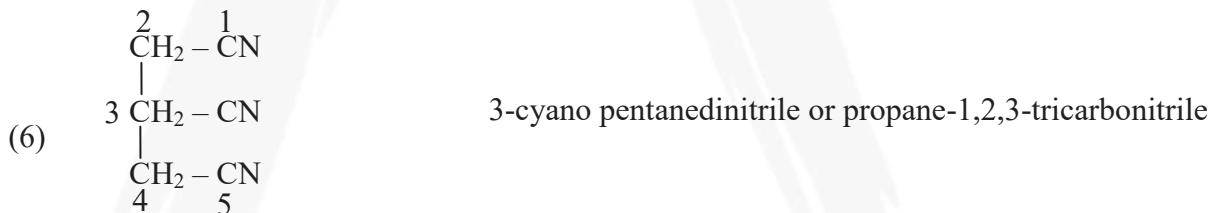
F.G	Suffix	Prefix	Spec.suffix
$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{H} \end{array}$	-al	formyl or oxo	carbaldehyde

Rule:- Alkane + al \rightarrow alkanal



F.G	Suffix	Prefix	Special suffix
-C≡N	Nitrile	-cyano	Carbonitrile

Rule : Alkane + Nitrile \rightarrow Alkane nitrile





(Organic Chemistry)

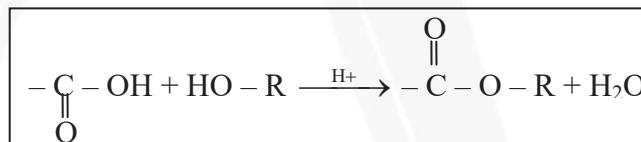
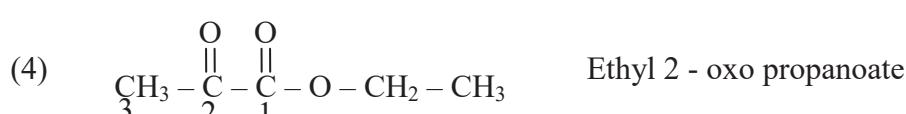
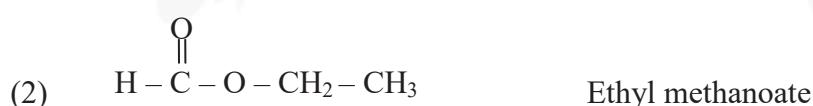
Classification and Nomenclature

NAMING OF ISOCYANIDE

	F.G -NC	Suffix Isocyanide	Prefix Isocyano
1.	R - NC	Alkyl Isocyanide	
2.	CH ₃ - NC	Methyl Isocyanide	
3.		Cyclopentyl Isocyanide	
4.	NC - ¹ C - ² C - ³ C - ⁴ C - NC		4 - Isocyano butanenitrile

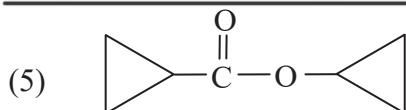
NAMING OF ESTER

F.g $\begin{array}{c} \text{---C---O---R'} \\ \parallel \\ \text{O} \end{array}$	Suffix -oate	Prefix $\begin{array}{c} \text{O} \\ \parallel \\ \text{---C---O---R'} \end{array}$	Special suffix Carboxylate
		Parent chain Alkoxy carbonyl	
		$\begin{array}{c} \text{O} \\ \parallel \\ \text{R---C---O---} \end{array}$ Alkonoyloxy	

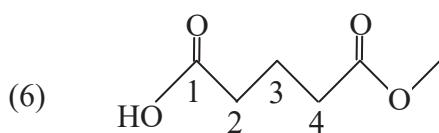
Rule :- Alkylalkane + oate \rightarrow Alkyl alkanoate

(Organic Chemistry)

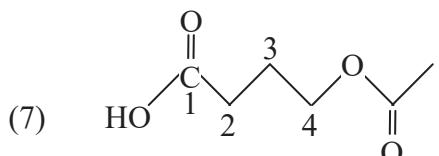
Classification and Nomenclature



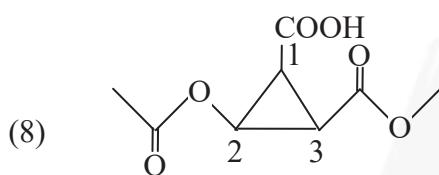
cyclobutyl cyclopropane carboxylate



4-Methoxycarbonyl Butanoic acid



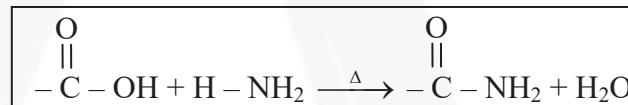
4 - ethanoyloxy Butanoic acid



2 - ethanoyloxy -3- methoxycarbonyl cyclopropanoic acid

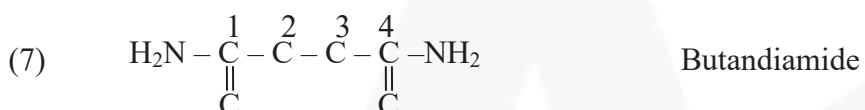
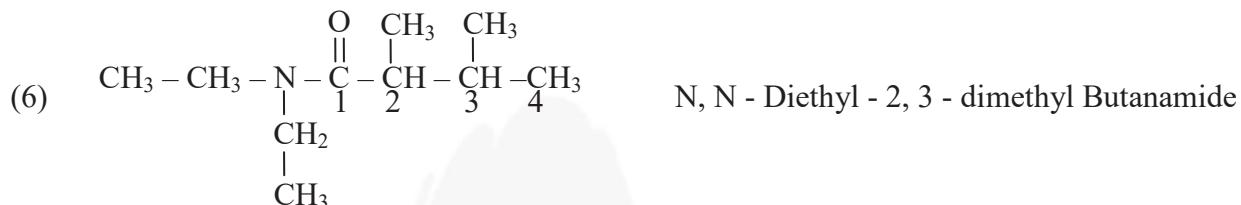
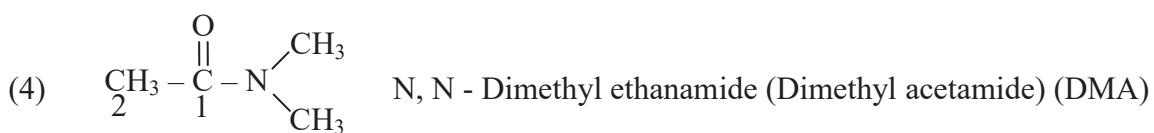
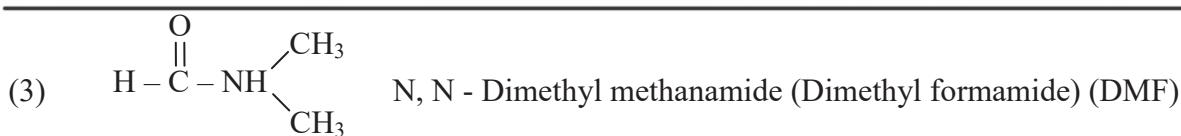
NAMING OF AMIDE

F.G	Suffix	Prefex	Special suffix
$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{NH}_2 \end{array}$	-Amide	Carbamoyl	Carboxamide

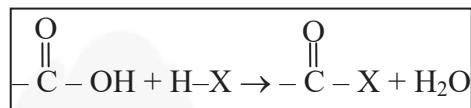
Rule :- Alkane + Amide \rightarrow Alkanamide

(Organic Chemistry)

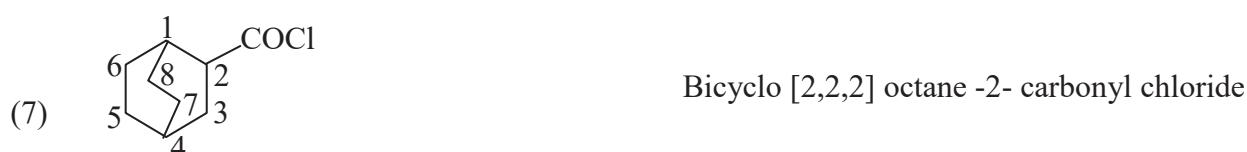
Classification and Nomenclature



F.G	Suffix	Prifex	Special suffix
$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{X} \end{array}$	-oyl halide	Halo Carbonyl	Carbonylhalide
$\text{X} = \text{F}, \text{Cl}, \text{Br}, \text{I}$			



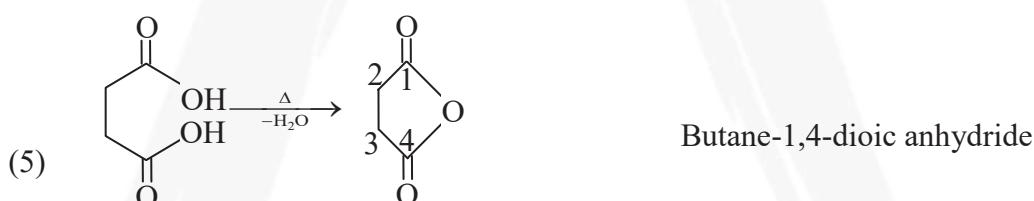
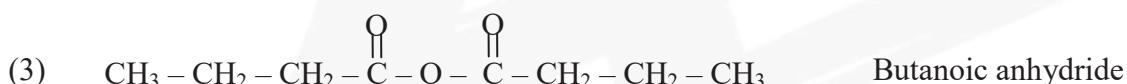
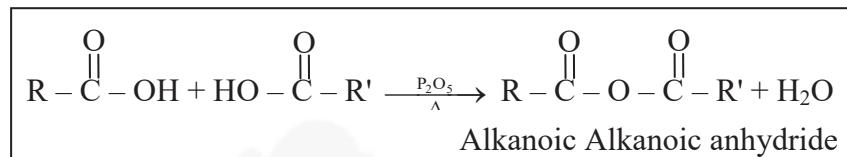
Rule: Alkane + oylhalide \rightarrow Alkanoyl halide

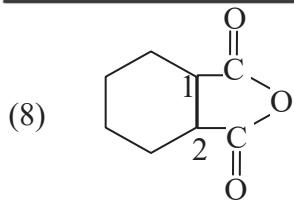


(Organic Chemistry) Classification and Nomenclature

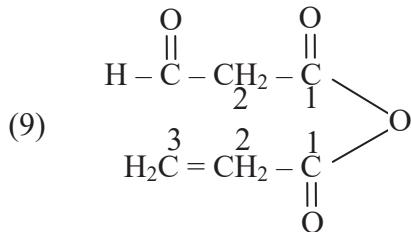
NAMING OF ACID ANHYDRIDE

F.G	Suffix	Special suffix
$\begin{array}{c} \text{---C---O---C---} \\ \parallel \qquad \parallel \\ \text{O} \qquad \text{O} \end{array}$	-oic anhydride	Carboxylic anhydride





Cyclohexane - 1, 2 - dicarboxylic anhydride



2- Formyl ethanoic prop-2-enoic anhydride

NAMING OF AMINES

F.G. -NH ₂	Suffix -amine	Prefix -amino
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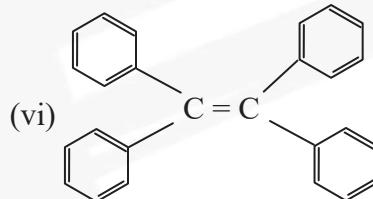
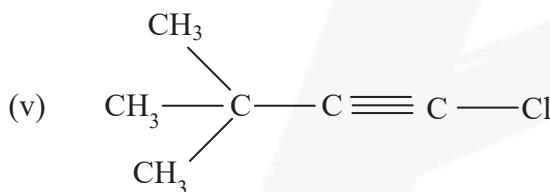
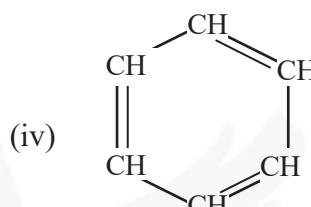
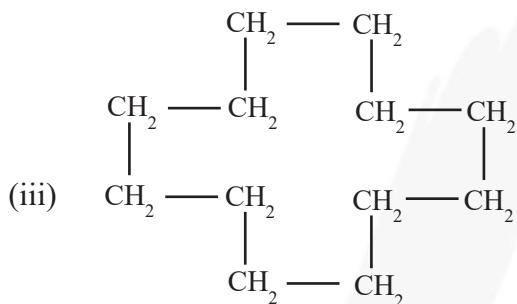
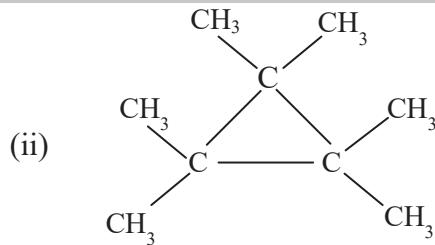
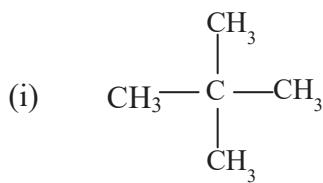
Rule:- Alkane + Amine → Alakanamine





**(Organic Chemistry) Classification and Nomenclature
ANSWER KEY**

DO YOURSELF – 1



DO YOURSELF – 2

(i) $1^\circ \rightarrow 5, 2^\circ \rightarrow 3, 3^\circ \rightarrow 1, 4^\circ \rightarrow 4$

(ii) $1^\circ \rightarrow 2, 2^\circ \rightarrow 8, 3^\circ \rightarrow 4, 4^\circ \rightarrow 0$

(iii) $1^\circ \rightarrow 6, 2^\circ \rightarrow 3, 3^\circ \rightarrow 6, 4^\circ \rightarrow 0$

DO YOURSELF – 3

(i) 1° alkyl halide

(ii) 2° alkyl halide

(iii) 3° alkyl halide

(iv) 1° alkyl halide

(v) 2° alkyl halide

DO YOURSELF – 4

(i) 1° alcohol (Primary alcohol)

(ii) 2° alcohol (Secondary alcohol)

(iii) 3° alcohol (Tertiary alcohol)

(iv) 1° alcohol



(Organic Chemistry)

Classification and Nomenclature**DO YOURSELF – 5**

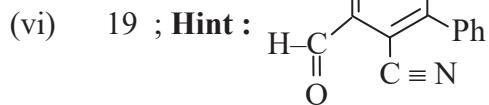
(i) 2

(ii) 6



(iv) 8

(v) 5

**DO YOURSELF – 6**

(i) 6

(ii) 3

(iii) 5

(iv) 3

(v) 4

DO YOURSELF – 7

(i) Methyl Cyclopropane

(ii) 1, 2 - Dimethyl cyclohexene

(iii) propyl cyclopropane

(iv) 1 - cyclohexyl - 3 - methyl pent - 1 - ene

(v) 1 - bromo-4-chloro cyclohexane

(vi) 1,3,5 - Tricyclopropyl cyclohexane