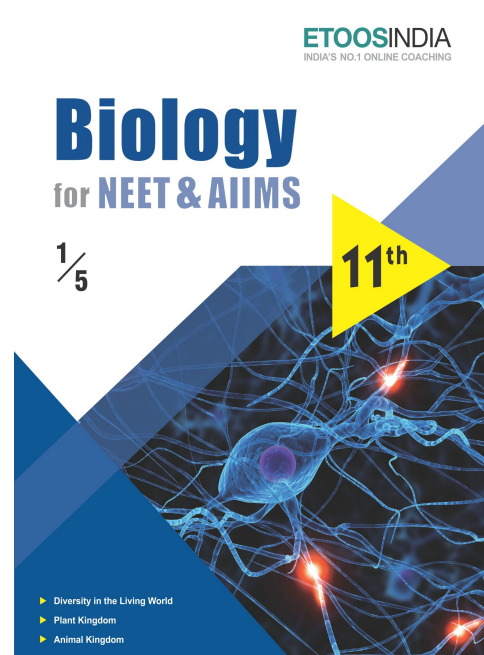
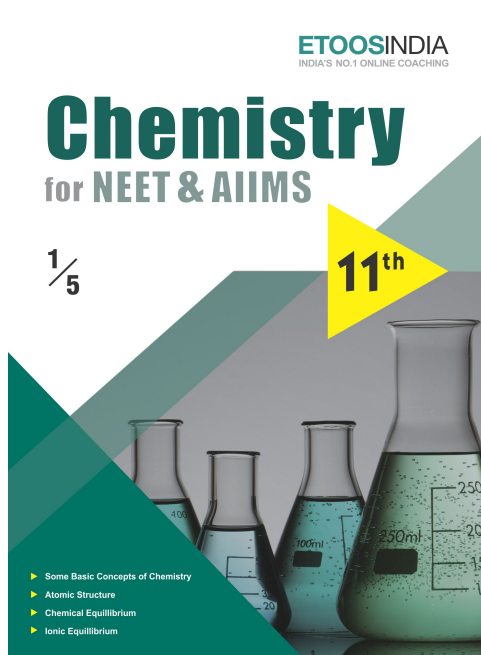
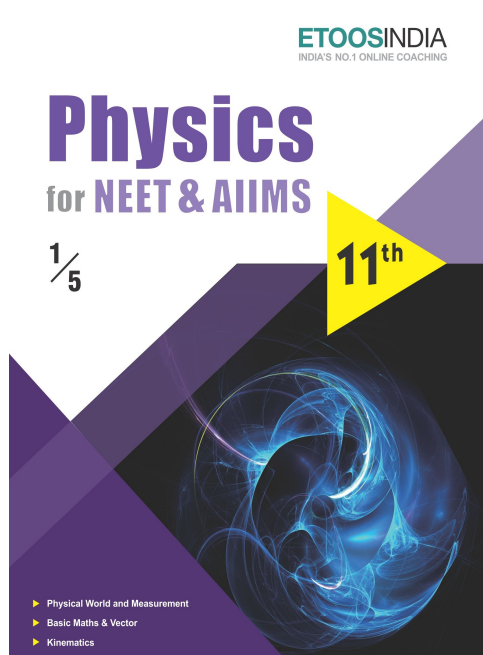


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# NOMENCLATURE OF ORGANIC COMPOUNDS

*Organic compounds exist in which a hydrogen atom, joined to the carbon, acquires acid properties as a result of the proximity of certain functional groupings.*

“VICTOR GRIGNARD”

## INTRODUCTION

The IUPAC of organic chemistry is a systematic method of naming organic chemical compounds as recommended by the International Union of Pure and Applied Chemistry (IUPAC). It is published in the nomenclature of organic chemistry. Ideally, every possible organic compounds should have a name which an unambiguous structural formula can be created.

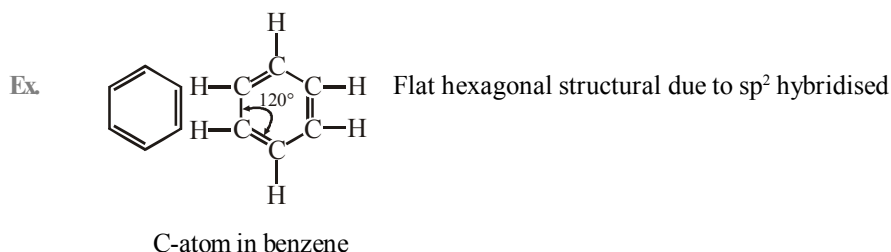
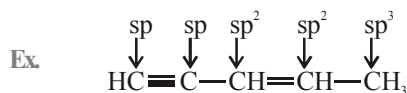
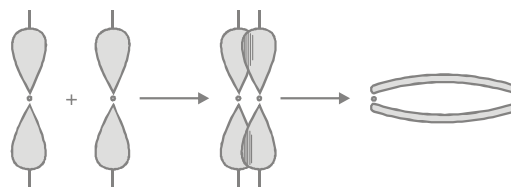
To avoid long and tedious names in normal communication the official IUPAC naming recommendations are not always followed in practice, except when it is necessary to give an unambiguous and absolute definition to a compound. IUPAC name can be simpler than older names, as with ethanol, instead of ethyl alcohol. For relatively simple molecules they can be more easily understood than non-systematic names, which must be learnt or looked up.

## NOMENCLATURE OF ORGANIC COMPOUNDS

**$\sigma$  - (sigma) bonds** : The molecular orbital formed by the overlapping of two-s atomic orbitals or one s and one p atomic orbitals or co-axial overlapping of p-orbitals is called a  $\sigma$  bond.

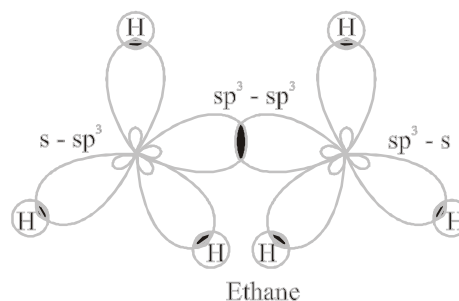
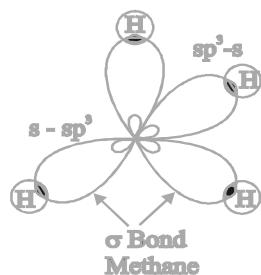


**$\pi$  (Pi) bonds** :  $\pi$  bond is formed by the lateral overlapping of two p-atomic orbitals. It is weaker than  $\sigma$  bond, as there is only partial overlapping.



### ETOOS KEY POINTS

- (i) Overlapping of hybrid orbitals also give  $\sigma$  bonds.  $\sigma$  bonds are stronger, as they are resulted from the effective axial overlapping.
- (ii) More the directional character (p) in covalent bond more is the strength of the bond.
 
$$\text{sp}^3 - \text{sp}^3 > \text{sp}^3 - \text{sp}^2 > \text{sp}^2 - \text{sp}^2 > \text{sp} - \text{sp}$$
- (iii)  $\pi$  electrons are mobile hence  $\pi$  bond is more reactive.  $\pi$  bond is formed by the collateral overlapping of  $\text{sp}^2$  orbitals.
- (iv)  $\text{sp}^2$  hybridised orbitals overlap with each other and with s orbitals of six H-atoms forming C-C and C-H  $\sigma$  bonds.
- (v) Six 2p unhybridised orbitals of 6 C-atom in benzene form 3 $\pi$  bonds by lateral overlapping with each other. These six  $\pi$  electrons are free to move over all the six carbon atoms. Since delocalised electrons have lower energy than localised.
- (vi) The relative sized of hybrid orbital follows the order  $\text{sp}^3 > \text{sp}^2 > \text{sp}$
- (vii) The electronegativity of hybrid orbitals follows the order  $\text{sp} > \text{sp}^2 > \text{sp}^3$



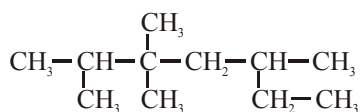
*Etoos Tips & Formulas*

The order of priority of functional groups used in IUPAC nomenclature of organic compounds.

| Functional Group     | Structure   | Prefix                            | Suffix         |
|----------------------|---|-----------------------------------|----------------|
| Carboxylic acid      | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{OH} \end{array}$               | Carboxy                           | - oic acid     |
| Sulphonic acid       | $-\text{SO}_3\text{H}$  | Sulpho                            | sulphonic acid |
| Ester                | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{OR} \end{array}$               | Alkoxy carbonyl                   | alkyl...oate   |
| Acid chloride        | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{Cl} \end{array}$               | Chloroformyl or<br>Chlorocarbonyl | - oyl chloride |
| Acid amide           | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{NH}_2 \end{array}$             | Carbamoyl/Amido                   | - amide        |
| Carbonitrile/Cyanide | $-\text{C} \equiv \text{N}$   | Cyano                             | nitrile        |
| Aldehyde             | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{H} \end{array}$                | Formyl or Oxo                     | - al           |
| Ketone               | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}- \end{array}$                        | Keto or oxo                       | - one          |
| Alcohol              | $-\text{OH}$  | Hydroxy                           | - ol           |
| Thio alcohol         | $-\text{SH}$  | Mercapto                          | thiol          |
| Amine                | $-\text{NH}_2$  | Amine                             | amine          |
| Ether                | $-\text{O}-\text{R}$  | Alkoxy                            | -              |
| Oxirane              | $\begin{array}{c} -\text{C}-\text{C}- \\ \diagdown \quad \diagup \\ \text{O} \end{array}$ | Epoxy                             | -              |
| Nitro derivative     | $-\text{NO}_2$  | Nitro                             | -              |
| Nitroso derivative   | $-\text{NO}$  | Nitroso                           | -              |
| Halide               | $-\text{X}$   | Halo                              | -              |
| Double bond          | $\text{C} = \text{C}$   | -                                 | ene            |
| Triple bond          | $\text{C} \equiv \text{C}$  | -                                 | yne            |

**SOLVED EXAMPLE**

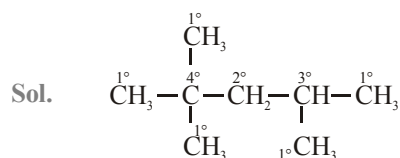
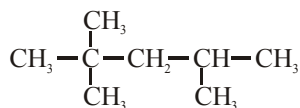
**Ex. 1** How many 1°, 2°, 3° and 4° carbon atoms are present in following molecule.



**Sol.** 1° Carbon atoms = 6,      2° Carbon atoms = 2,  
3° Carbon atoms = 2,      4° Carbon atom = 1

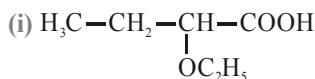
**Note :** Primary, secondary, tertiary & quaternary carbon atoms in a molecule are denoted by the letters p, s, t and q respectively.

**Ex. 2** How many 1°, 2°, 3° and 4° carbon atoms are present in following molecule.

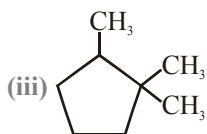


1° Carbon atoms = 5,      2° Carbon atom = 1,  
3° Carbon atom = 1,      4° Carbon atom = 1

**Ex. 3** Write the IUPAC name of following compounds.

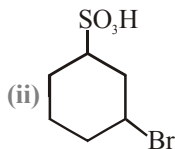


(ii) 3-Bromocyclohexane-1-sulphonic acid

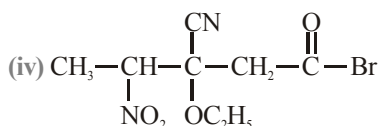


(iv) 3-Cyano-3-ethoxy-4-nitropentanoyl bromide

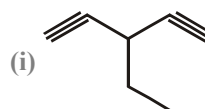
**Sol.** (i) 2-Ethoxybutanoic acid



(iii) 1,1,2-Trimethylcyclopentane

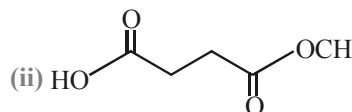


**Ex. 4** Draw the structure of following IUPAC name.



(ii) 3-Methoxycarbonylpropanoic acid

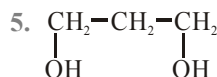
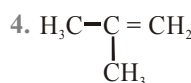
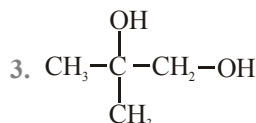
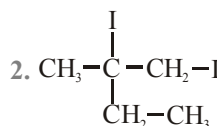
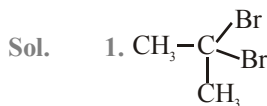
**Sol.** (i) 3-Ethypenta-1,4-diyne



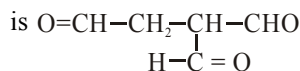
**Ex. 5** Make the structure of following organic compounds

1. Isopropylidene Bromide
2. Active amylene Iodide
3. Isobutylene glycol
4. Isobutylene

5. Trimethylene glycol

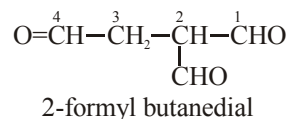


**Ex. 6** The correct IUPAC name of the following compound



- (A) 1,1-diformyl propanal  
(B) 3-formyl butanedial  
(C) 2-formyl butanedial  
(D) 1, 1,3-ethane tricarbaldehyde

**Sol.** (C) The principal functional group is -CHO.



Exercise # 1

SINGLE OBJECTIVE


NEET LEVEL

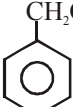
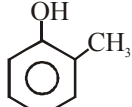
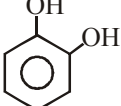
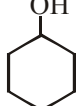
- The hybrid state of C-atoms which are attached to a single bond with each other in the following structure are :  

$$\text{CH}_2 = \text{CH} - \text{C} \equiv \text{CH}$$

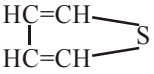
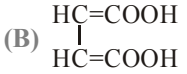
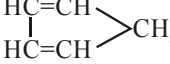
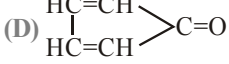
(A)  $sp^2, sp$  (B)  $sp^3, sp$   
 (C)  $sp^2, sp^2$  (D)  $sp^2, sp^3$
- In the compound  $\text{HC} \equiv \text{C} - \text{CH}_2 - \text{CH} = \text{CH} - \text{CH}_3$ , the  $\text{C}_2 - \text{C}_3$  bond is the type of :  
 (A)  $sp - sp^2$  (B)  $sp^3 - sp^3$   
 (C)  $sp - sp^3$  (D)  $sp^2 - sp^2$
- The number of acetynilic bond in the structure are :  

$$\text{CH} \equiv \text{C} - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH} = \text{CH} - \text{C} \equiv \text{N}$$

(A) 2 (B) 3  
 (C) 1 (D) 4
- The group of heterocyclic compound is :  
 (A) Phenol, Furane (B) Furane, Thiophene  
 (C) Thiophene, Phenol (D) Furane, Aniline
- Which of the following is the first member of ester homologous series ?  
 (A) Ethyl ethanoate (B) Methyl ethanoate  
 (C) Methyl methanoate (D) Ethyl methanoate
- Which of the following compound's prefix 'iso' is not correct –  
 (A) Iso pentane (B) Iso Hexane  
 (C) Iso butane (D) Iso octane
- A substance containing an equal number of primary, secondary and tertiary carbon atoms is :  
 (A) Mesityl Oxide (B) Mesitylene  
 (C) Maleic acid (D) Malonic acid
- How many secondary carbon atoms does methyl cyclopropane have ?  
 (A) Nine (B) One  
 (C) Two (D) Three 
- The IUPAC name of the compound  

$$\text{CH}_3 - \text{CH} = \underset{\text{CH}_2 - \text{CH}_3}{\text{C}} - \text{CH}_3$$
 is :  
 (A) 2-Ethyl-2-butene (B) 3-Ethyl-2-butene  
 (C) 3-Ethyl-2-butene (D) 3-methyl-2-pentene
- IUPAC name of  $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{C} \equiv \text{CH}$  is :  
 (A) 1, 4-Hexenyne (B) 1-Hexen-5-yne  
 (C) 1-Hexyne-5-ene (D) 1, 5-Hexyne
- $(\text{CH}_3)_3\text{C} - \text{CH} = \text{CH}_2$  has the IUPAC name :  
 (A) 3,3-Dimethyl-1-butene  
 (B) 2, 2-Dimethyl-1-butene  
 (C) 2, 2-Dimethyl-3-butene  
 (D) 1, 3-Dimethyl-1-propene
- What is not true about homologous series ?  
 (A) All the members have similar chemical properties  
 (B) They have identical physical properties  
 (C) They can be represented by a general formula  
 (D) Adjacent members differ in molecular mass by 14
- The homologue of phenol is –  
 (A)  (B)   
 (C)  (D) 
- The IUPAC name of the following is  

$$[\text{CH}_3\text{CH}(\text{CH}_3)]_2\text{C}(\text{CH}_2\text{CH}_3)\text{C}(\text{CH}_3)\text{C}(\text{CH}_2\text{CH}_3)_2$$

(A) 3,5-Diethyl-4,6-dimethyl-5-[1-methylethyl] hept-3-ene  
 (B) 3, 5-Diethyl-5-isopropyl-4, 6-dimethylhept-2-ene  
 (C) 3,5-Diethyl-5-propyl-4, 6-dimethylhept-3-ene  
 (D) None of these
- Which of the following is a heterocyclic compound  
 (A)  (B)   
 (C)  (D) 
- Ethyl methyl vinyl amine has the structure –  
 (A)  $\text{CH}_3\text{CH}_2 - \underset{\text{CH}_3}{\text{N}} - \text{CH}_2\text{CH} = \text{CH}_2$   
 (B)  $\text{CH}_3\text{CH}_2 - \underset{\text{CH}_3}{\text{N}} - \text{CH} = \text{CH}_2$   
 (C)  $\text{CH}_2 = \text{CH} - \underset{\text{CH}_3}{\text{N}} - \text{CH} = \text{CH}_2$   
 (D)  $\text{CH}_3 - \underset{\text{CH}_3}{\text{N}} - \text{CH} = \text{CH}_2$

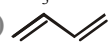
## Exercise # 2

### SINGLE OBJECTIVE


### AIIMS LEVEL

- The number of C-atoms in second member of an ester is/are :  
 (A) 2 (B) 3  
 (C) 4 (D) 1
- The number of primary, secondary and tertiary carbon atom in toluene is given by the set :  
 (A) 1, 6, 0 (B) 1, 5, 1  
 (C) 2, 5, 0 (D) 1, 6, 1
- $C_3H_6Br_2$  can show :  
 (A) Two gem dibromide  
 (B) Three vic dibromide  
 (C) Two tert. dibromo alkane  
 (D) Two sec. dibromo alkane
- What is the correct IUPAC name for the following compound ?  

$$\begin{array}{c}
 \text{CH}_3 \\
 | \\
 \text{CH}_3(\text{CH}_2)_4\text{CH}-\text{C}-\text{CH}_2\text{CH}_2\text{CH}_3 \\
 | \quad | \\
 \text{CH}_3 \quad \text{CH}_2-\text{CH}_3
 \end{array}$$
 (A) 3, 4-Dimethyl-3-propyl nonane  
 (B) 6, 7-Dimethyl-2-propyl nonane  
 (C) 6, 7-Dimethyl-7-ethyl decane  
 (D) 4-Ethyl-4, 5-dimethyl decane
- The IUPAC name for  $\text{HC} \equiv \text{C}-\underset{\text{CH}_3}{\text{C}}=\text{CH}-\text{CH}_3$   
 (A) 3-methyl-2-pentene-4-yne  
 (B) 3-Methyl-3-pentene-1-yne  
 (C) 3-methyl-4-pentyne-1-yne  
 (D) 3-Methyl pentenyne
- The IUPAC name of the compound Glycerine  

$$\begin{array}{c}
 \text{CH}_2-\text{CH}-\text{CH}_2 \\
 | \quad | \quad | \\
 \text{OH} \quad \text{OH} \quad \text{OH}
 \end{array}$$
 (A) 1, 2, 3-Tri hydroxy propane  
 (B) 3-Hydroxy pentane-1, 5-diol  
 (C) 1, 2, 3-Hydroxy propane  
 (D) Propane-1,2,3-triol
- Which of the following is crotonic acid :  
 (A)  $\text{CH}_2=\text{CH}-\text{COOH}$   
 (B)  $\text{C}_6\text{H}_5-\text{CH}=\text{CH}-\text{COOH}$   
 (C)  $\text{CH}_3-\text{CH}=\text{CHCOOH}$   
 (D)  $\begin{array}{c} \text{CH}-\text{COOH} \\ || \\ \text{CH}-\text{COOH} \end{array}$
- In which of the following species a carbon has  $sp$ -hybridization :  
 (A)  $\text{CH}_3\text{COOH}$  (B)  $\text{CH}_3\text{COCH}_3$   
 (C)  $\text{CH}_3-\text{CH}_2-\text{CN}$  (D) 
- All the following IUPAC name are correct except :  
 (A) 1-Chloro-1-ethoxy propane  
 (B) 1-Amino-1-ethoxypropane  
 (C) 1-Ethoxy-2-propanol  
 (D) 1-Ethoxy-1-propanamine
- Number of  $3^\circ$  carbon and  $1^\circ$  hydrogen respectively in the following structure are :  

$$\begin{array}{c}
 \text{Me} \quad \text{Me} \quad \text{Me} \quad \text{H} \\
 | \quad | \quad | \quad | \\
 \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{Me} \\
 | \quad | \quad | \quad | \\
 \text{Me} \quad \text{H} \quad \text{Me} \quad \text{Me}
 \end{array}$$
 (A) 3, 21 (B) 3, 23  
 (C) 2, 18 (D) 3, 18
- Which of the following are tertiary radicals :  
 (A)  $(\text{CH}_3)_3\dot{\text{C}}$  (B)  $(\text{CH}_3)_2\dot{\text{C}}\text{H}$   
 (C)  $(\text{CH}_3)_2\dot{\text{C}}-\text{C}_2\text{H}_5$  (D)  $(\text{CH}_3)_3\text{C}-\dot{\text{C}}\text{H}_2$
- The correct IUPAC name for the given structure is :  

$$\begin{array}{c}
 \text{CH}_3 \\
 | \\
 \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \\
 | \quad | \\
 \text{H}_3\text{C}-\text{CH}-\text{CH}_3
 \end{array}$$
 (A) 3-Isopropyl-4-methylhexane  
 (B) 4-Isopropyl-3-methylhexane  
 (C) 3-Ethyl-2, 5-dimethylhexane  
 (D) 2-Ethyl-3-isopropylpentane
- The IUPAC name of  is :  
 (A) 2, 3-Dimethyl hexane  
 (B) 2-Ethyl-4-methyl pentane  
 (C) 3-Ethyl-2-methyl pentane  
 (D) 2, 4-Dimethyl hexane
- The IUPAC name of the compound is  

$$\begin{array}{c}
 \text{Ph} \\
 | \\
 \text{CH}_3-\text{CH}-\text{CH}-\text{NH}_2 \\
 | \\
 \text{CH}_3
 \end{array}$$
 (A) 1-Amino-1-phenyl-2-methyl propane  
 (B) 2-Methyl-1-phenyl propane-1-amine  
 (C) 2-Methyl-1-amino-1-phenyl propane  
 (D) 2-Chloro-2-Methylpropane

**Exercise # 3**

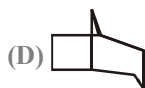
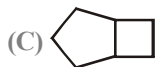
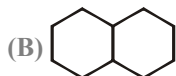
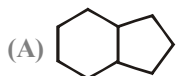
**PART - 1**

**MATRIX MATCH COLUMN**

1. Match column I with column II and select the correct answer from the given codes :

**Column - I**

**(Compounds)**



**Column - II**

**(number of carbons in the bridges)**

(p) [3.2.1]

(q) [4.3.0]

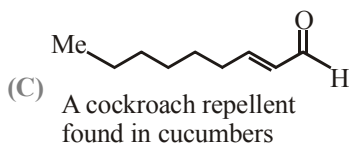
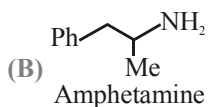
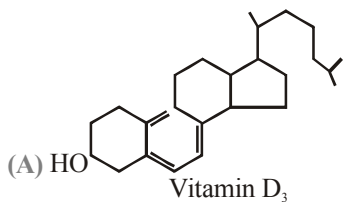
(r) [4.4.0]

(s) [3.2.0]

2. Match the column

**Column - I**

**Compound**



**Column - II**

**Containing all the functional groups**

(p) 1° amine

(q) 2° alcohol

(r) Triene

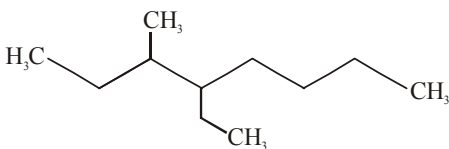
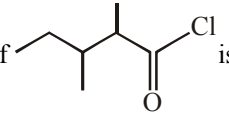
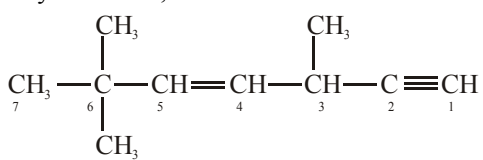
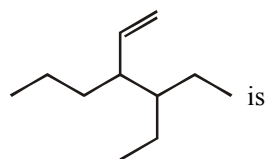
(s) Aldehyde and ene



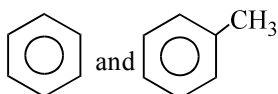
**Exercise # 4**

**PART - 1**

**PREVIOUS YEAR (NEET/AIPMT)**

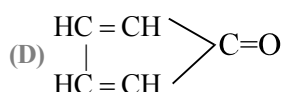
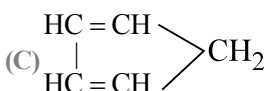
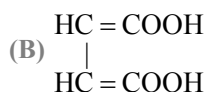
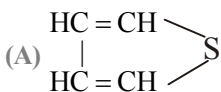
1. The incorrect IUPAC name is [CBSE AIPMT 2001]
- (A)  $\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3$   
2-methyl-3-butanone
- (B)  $\text{CH}_3 - \underset{\text{CH}_3}{\parallel}{\text{CH}} - \underset{\text{CH}_2 - \text{CH}_3}{\text{CH}} - \text{CH}_3$   
2, 3-dimethyl pentane
- (C)  $\text{CH}_3 - \text{C} \equiv \text{CCH}(\text{CH}_3)_2$   
4-methyl-2pentyne
- (D)  $\text{CH}_3 - \underset{\text{Cl}}{\parallel}{\text{CH}} - \underset{\text{Br}}{\text{CH}} - \text{CH}_3$   
2-bromo-3chloro butane
2. IUPAC name of the following is [CBSE AIPMT 2002]
- $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{C} \equiv \text{CH}$
- (A) 1, 5-hexenyne (B) 1-hexene-5-yne  
(C) 1-hexyne-5-ene (D) 1, 5-hexynene
3. Name of the compound given below [CBSE AIPMT 2003]
- 
- (A) 2, 3-diethylheptane  
(B) 5-ethyl-6-methyloctane  
(C) 4-ethyl-3-methyloctane  
(D) 3-methyl-4-ethyloctane
4. Names of some compounds are given. Which one is not correct in IUPAC system? [CBSE AIPMT 2005]
- (A)  $\text{CH}_3 - \underset{\text{OH}}{\text{CH}} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3$   
3-methyl-2-butanol
- (B)  $\text{CH}_3 - \text{C} \equiv \text{CH} - \text{CH}(\text{CH}_3)_2$   
4-methyl-2-pentyne
- (C)  $\text{CH}_3 - \underset{\text{CH}_2}{\parallel}{\text{C}} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3$   
2-ethyl-3-methylbut-ene
- (D)  $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \underset{\text{CH}_2\text{CH}_3}{\text{CH}} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2\text{CH}_3$   
3-methyl-4-ethyl heptane
5. The IUPAC name of  is [CBSE AIPMT 2006]
- (A) 3, 4-dimethylpentanoyl chloride  
(B) 1-chloro-1-oxo-2, 3-dimethylpentane  
(C) 2-ethyl-3methylbutanoyl chloride  
(D) 2, 3-dimethyl pentanoyl chloride
6. The state of hybridisation of  $\text{C}_2$ ,  $\text{C}_3$ ,  $\text{C}_5$  and  $\text{C}_6$  of the hydrocarbon,
- 
- is in the following sequence [CBSE AIPMT 2009]
- (A)  $sp, sp^3, sp^2$  and  $sp^3$   
(B)  $sp^3, sp^2, sp^2$  and  $sp$   
(C)  $sp, sp^2, sp^2$  and  $sp^3$   
(D)  $sp, sp^2, sp^3$  and  $sp^2$
7. The IUPAC name of the compound having the formula  $\text{CH} \equiv \text{C} - \text{CH} = \text{CH}_2$  is [CBSE AIPMT 2009]
- (A) 3-butene-1-yne (B) 1-butyne-3-ene  
(C) but-1-yne-3-ene (D) 1-butene-3-yne
8. The correct IUPAC name of the compound [CBSE AIPMT 2011]
- 
- (A) 3-ethyl-4-ethenylheptane  
(B) 3-ethyl-4-propylhex-5-ene  
(C) 3-(1-ethyl propyl) hex-1-ene  
(D) 4-ethyl-3-propylhex-1-ene

- How many carbons are in simplest alkyne having two side chains?  
(A) 5 (B) 6 (C) 7 (D) 8
- The commercial name of trichloroethene is:  
(A) Westron (B) Perclene (C) Westrosol (D) Orlone
- The compound which has one isopropyl group is:  
(A) 2,2,3,3-Tetramethyl pentane (B) 2,2-Dimethyl pentane  
(C) 2,2,3-Trimethyl pentane (D) 2-Methyl pentane




Number of secondary carbon atoms present in the above compounds are respectively:

- (A) 6,4,5 (B) 4,5,6 (C) 5,4,6 (D) 6,2,1
- A substance containing an equal number of primary, secondary and tertiary carbon atoms is:  
(A) Mesityl Oxide (B) Mesitylene  
(C) Maleic acid (D) Malonic acid
  - Which of the following is a heterocyclic compound



- The correct IUPAC name of the compound  $\text{CH}_3 - \text{CH}_2 - \overset{\text{CH}_3}{\underset{\text{C}_2\text{H}_5}{\text{C}}} = \text{C} - \underset{\text{C}_2\text{H}_5}{\text{CH}} - \overset{\text{CH}_3}{\text{C}} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$  :  
(A) 5-Ethyl-3, 6-dimethyl non-3-ene (B) 5-Ethyl-4, 7-dimethyl non-3-ene  
(C) 4-Methyl-5, 7-diethyl oct-2-ene (D) 2,4-Ethyl-5-methyl oct-2-ene

- IUPAC name of  is:

- (A) 5-Methyl hexanol (B) 2-Methyl hexanol  
(C) 2-Methyl hex-3-enol (D) 4-Methyl pent-2-enol
- The IUPAC name of acetyl acetone is:  
(A) Pentane-2,5- dione (B) Pentane -2,4-dione (C) Hexane-2,4-dione (D) Butane-2,4-dione
  - When vinyl & allyl are joined each other, we get  
(A) Conjugated alkadiene (B) cumulative alkadiene  
(C) Isolated alkadiene (D) Allenes

# 11<sup>th</sup> Class Modules Chapter Details

Physics  
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Modules

Chemistry  
5  
Modules

Mathematics  
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Modules

| PHYSICS  | CHEMISTRY   | BIOLOGY  |
|--|---|--|
| <p><b>Module-1</b></p> <ol style="list-style-type: none"> <li>1. Physical World &amp; Measurements</li> <li>2. Basic Maths &amp; Vector</li> <li>3. Kinematics</li> </ol> <p><b>Module-2</b></p> <ol style="list-style-type: none"> <li>1. Law of Motion &amp; Friction</li> <li>2. Work, Energy &amp; Power</li> </ol> <p><b>Module-3</b></p> <ol style="list-style-type: none"> <li>1. Motion of system of particles &amp; Rigid Body</li> <li>2. Gravitation</li> </ol> <p><b>Module-4</b></p> <ol style="list-style-type: none"> <li>1. Mechanical Properties of Matter</li> <li>2. Thermal Properties of Matter</li> </ol> <p><b>Module-5</b></p> <ol style="list-style-type: none"> <li>1. Oscillations</li> <li>2. Waves</li> </ol> | <p><b>Module-1(PC)</b></p> <ol style="list-style-type: none"> <li>1. Some Basic Concepts of Chemistry</li> <li>2. Atomic Structure</li> <li>3. Chemical Equilibrium</li> <li>4. Ionic Equilibrium</li> </ol> <p><b>Module-2(PC)</b></p> <ol style="list-style-type: none"> <li>1. Thermodynamics &amp; Thermochemistry</li> <li>2. Redox Reaction</li> <li>3. States Of Matter (Gaseous &amp; Liquid)</li> </ol> <p><b>Module-3(IC)</b></p> <ol style="list-style-type: none"> <li>1. Periodic Table</li> <li>2. Chemical Bonding</li> <li>3. Hydrogen &amp; Its Compounds</li> <li>4. S-Block</li> </ol> <p><b>Module-4(OC)</b></p> <ol style="list-style-type: none"> <li>1. Nomenclature of Organic Compounds</li> <li>2. Isomerism</li> <li>3. General Organic Chemistry</li> </ol> <p><b>Module-5(OC)</b></p> <ol style="list-style-type: none"> <li>1. Reaction Mechanism</li> <li>2. Hydrocarbon</li> <li>3. Aromatic Hydrocarbon</li> <li>4. Environmental Chemistry &amp; Analysis Of Organic Compounds</li> </ol> | <p><b>Module-1</b></p> <ol style="list-style-type: none"> <li>1. Diversity in the Living World</li> <li>2. Plant Kingdom</li> <li>3. Animal Kingdom</li> </ol> <p><b>Module-2</b></p> <ol style="list-style-type: none"> <li>1. Morphology in Flowering Plants</li> <li>2. Anatomy of Flowering Plants</li> <li>3. Structural Organization in Animals</li> </ol> <p><b>Module-3</b></p> <ol style="list-style-type: none"> <li>1. Cell: The Unit of Life</li> <li>2. Biomolecules</li> <li>3. Cell Cycle &amp; Cell Division</li> <li>4. Transport in Plants</li> <li>5. Mineral Nutrition</li> </ol> <p><b>Module-4</b></p> <ol style="list-style-type: none"> <li>1. Photosynthesis in Higher Plants</li> <li>2. Respiration in Plants</li> <li>3. Plant Growth and Development</li> <li>4. Digestion &amp; Absorption</li> <li>5. Breathing &amp; Exchange of Gases</li> </ol> <p><b>Module-5</b></p> <ol style="list-style-type: none"> <li>1. Body Fluids &amp; Its Circulation</li> <li>2. Excretory Products &amp; Their Elimination</li> <li>3. Locomotion &amp; Its Movement</li> <li>4. Neural Control &amp; Coordination</li> <li>5. Chemical Coordination and Integration</li> </ol> |

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# 12<sup>th</sup> Class Modules Chapter Details

Physics  
5  
Modules

Chemistry  
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Modules

Mathematics  
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Modules

| PHYSICS  | CHEMISTRY  | BIOLOGY  |
|--|--|--|
| <p><b>Module-1</b></p> <ol style="list-style-type: none"> <li>1. Electrostatics</li> <li>2. Capacitance</li> </ol> <p><b>Module-2</b></p> <ol style="list-style-type: none"> <li>1. Current Electricity</li> <li>2. Magnetic Effect of Current and Magnetism</li> </ol> <p><b>Module-3</b></p> <ol style="list-style-type: none"> <li>1. Electromagnetic Induction</li> <li>2. Alternating Current</li> </ol> <p><b>Module-4</b></p> <ol style="list-style-type: none"> <li>1. Geometrical Optics</li> <li>2. Wave Optics</li> </ol> <p><b>Module-5</b></p> <ol style="list-style-type: none"> <li>1. Modern Physics</li> <li>2. Nuclear Physics</li> <li>3. Solids &amp; Semiconductor Devices</li> <li>4. Electromagnetic Waves</li> </ol> | <p><b>Module-1(PC)</b></p> <ol style="list-style-type: none"> <li>1. Solid State</li> <li>2. Chemical Kinetics</li> <li>3. Solutions and Colligative Properties</li> </ol> <p><b>Module-2(PC)</b></p> <ol style="list-style-type: none"> <li>1. Electrochemistry</li> <li>2. Surface Chemistry</li> </ol> <p><b>Module-3(IC)</b></p> <ol style="list-style-type: none"> <li>1. P-Block Elements</li> <li>2. Transition Elements (d &amp; f block)</li> <li>3. Co-ordination Compound</li> <li>4. Metallurgy</li> </ol> <p><b>Module-4(OC)</b></p> <ol style="list-style-type: none"> <li>1. HaloAlkanes &amp; HaloArenes</li> <li>2. Alcohol, Phenol &amp; Ether</li> <li>3. Aldehyde, Ketone &amp; Carboxylic Acid</li> </ol> <p><b>Module-5(OC)</b></p> <ol style="list-style-type: none"> <li>1. Nitrogen &amp; Its Derivatives</li> <li>2. Biomolecules &amp; Polymers</li> <li>3. Chemistry in Everyday Life</li> </ol> | <p><b>Module-1</b></p> <ol style="list-style-type: none"> <li>1. Reproduction in Organisms</li> <li>2. Sexual Reproduction in Flowering Plants</li> <li>3. Human Reproduction</li> <li>4. Reproductive Health</li> </ol> <p><b>Module-2</b></p> <ol style="list-style-type: none"> <li>1. Principles of Inheritance and Variation</li> <li>2. Molecular Basis of Inheritance</li> <li>3. Evolution</li> </ol> <p><b>Module-3</b></p> <ol style="list-style-type: none"> <li>1. Human Health and Disease</li> <li>2. Strategies for Enhancement in Food Production</li> <li>3. Microbes in Human Welfare</li> </ol> <p><b>Module-4</b></p> <ol style="list-style-type: none"> <li>1. Biotechnology: Principles and Processes</li> <li>2. Biotechnology and Its Applications</li> <li>3. Organisms and Populations</li> </ol> <p><b>Module-5</b></p> <ol style="list-style-type: none"> <li>1. Ecosystem</li> <li>2. Biodiversity and Conservation</li> <li>3. Environmental Issues</li> </ol> |

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