

Unit-I Part-I

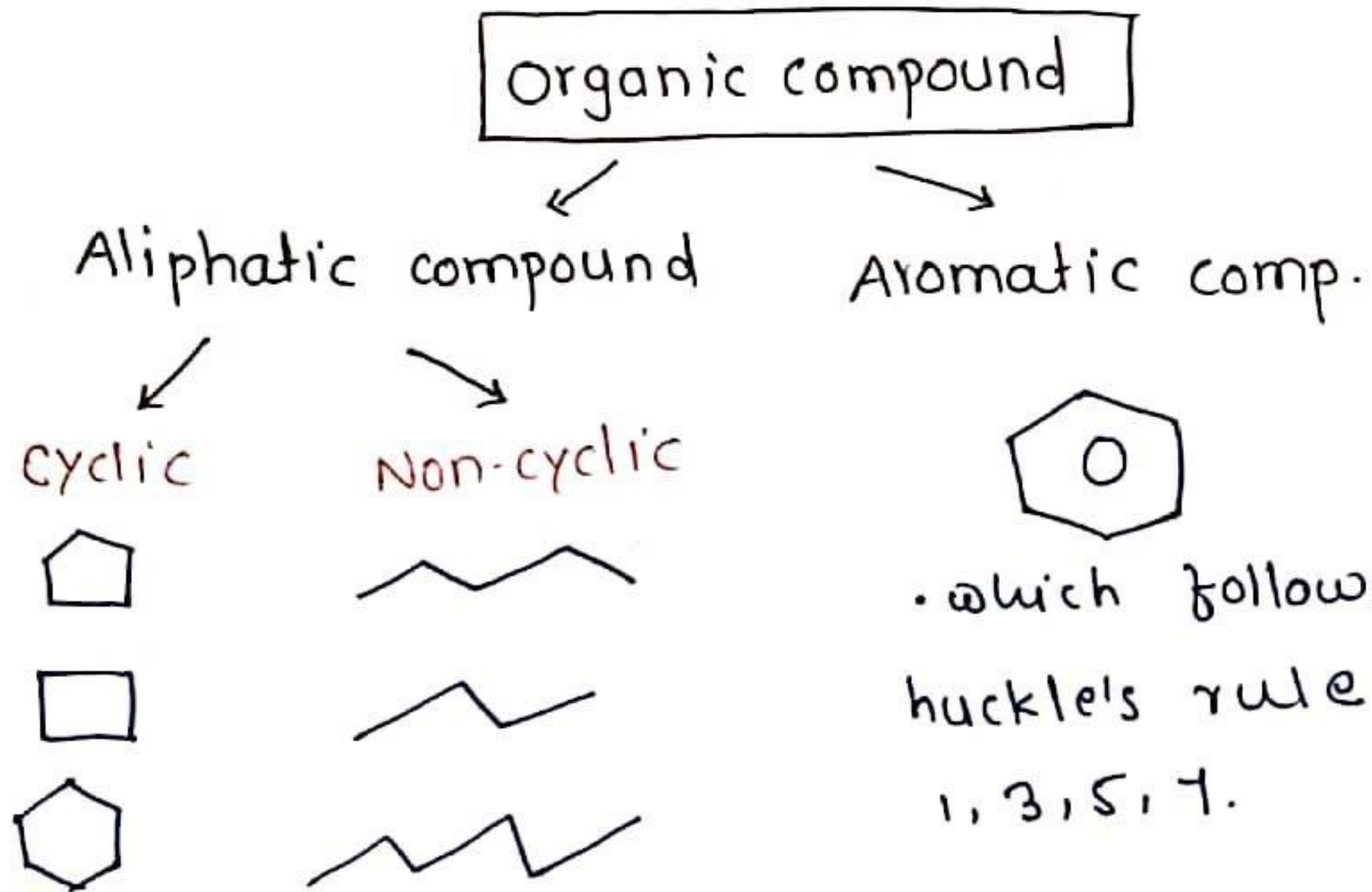
* Benzene and its derivatives:

- Compound which contain carbon are known as organic compound.

ex: CH₄, HCl, HCN, CO₂, COOH.

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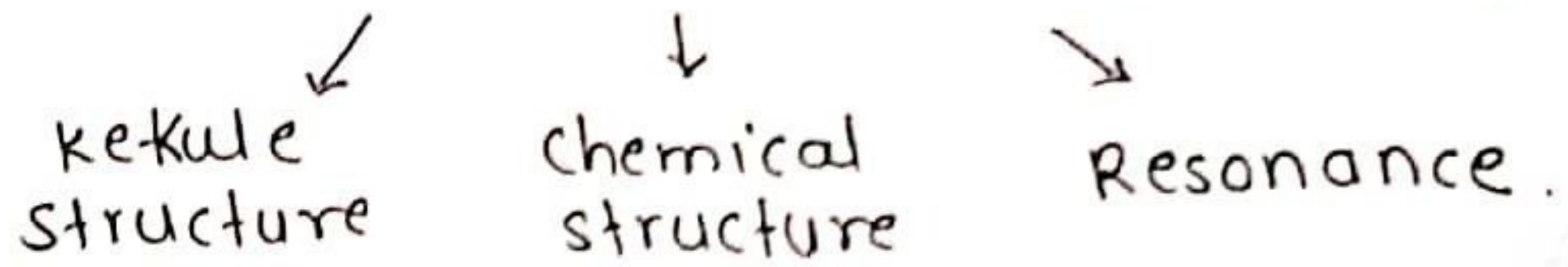
- here, HCH contains carbon but it is not an organic compound it is an Inorganic compound.



• which follows huckle's rule
1, 3, 5, 7.

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• structure of Benzene



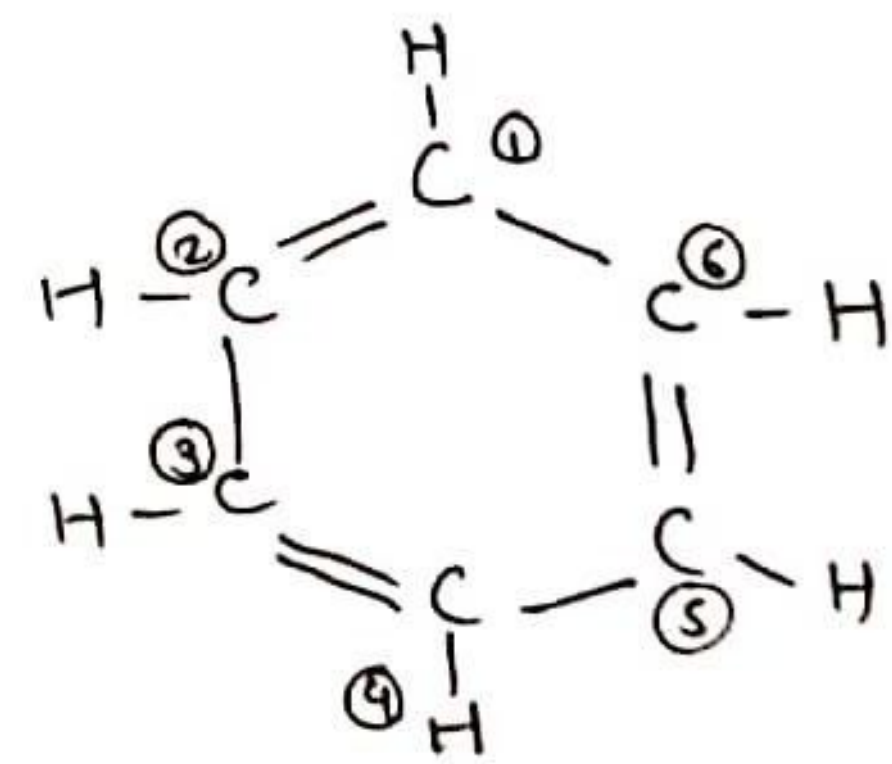
① kekule structure: [DEPTH OF BIOLOGY]



- 1st and 6th carbon are bonded with each other said by kekule
- Aromatic compound.
- Cyclic compound.
- Having 6 member ring

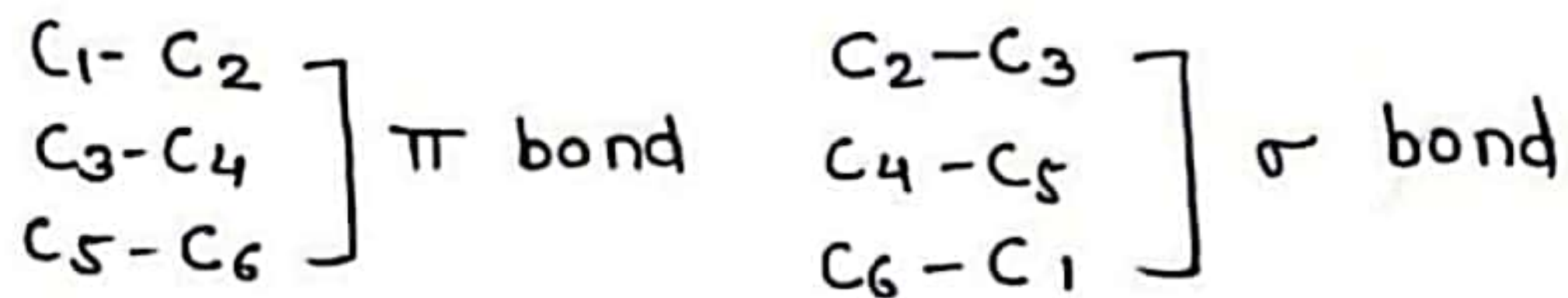
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② chemical structure:



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- Chemical formula of Benzene is C_6H_6 / m.w = 78.



- 12 σ bonds & 3 π bonds

1) In Benzene all carbons are sp^2 hybridized.

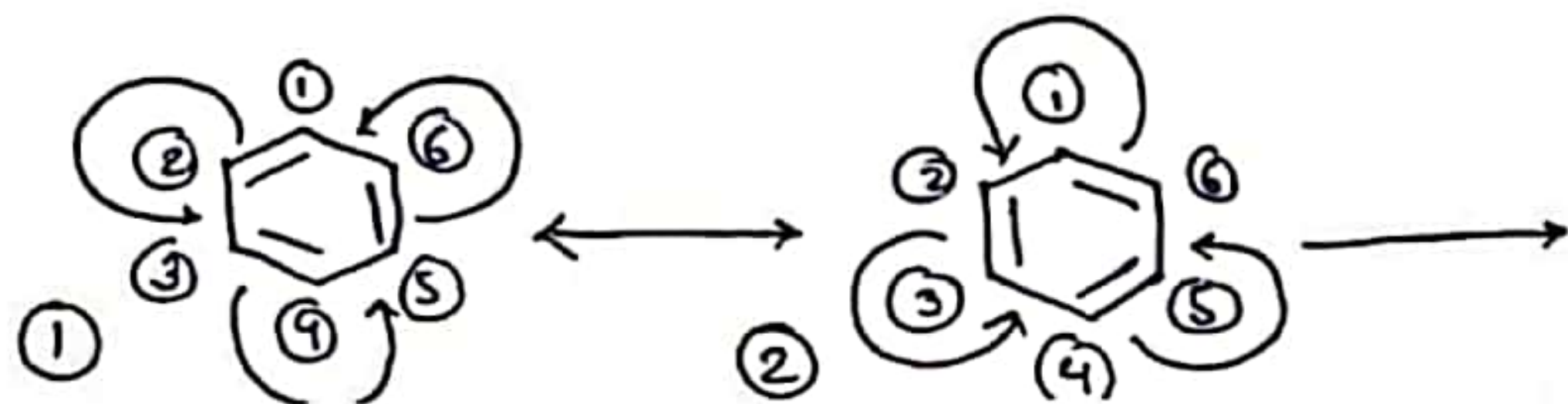
2) c-c have bond angle 120° .

3) Bond angle between $\rightarrow C_2-C_3 \rightarrow 1.37A^\circ$

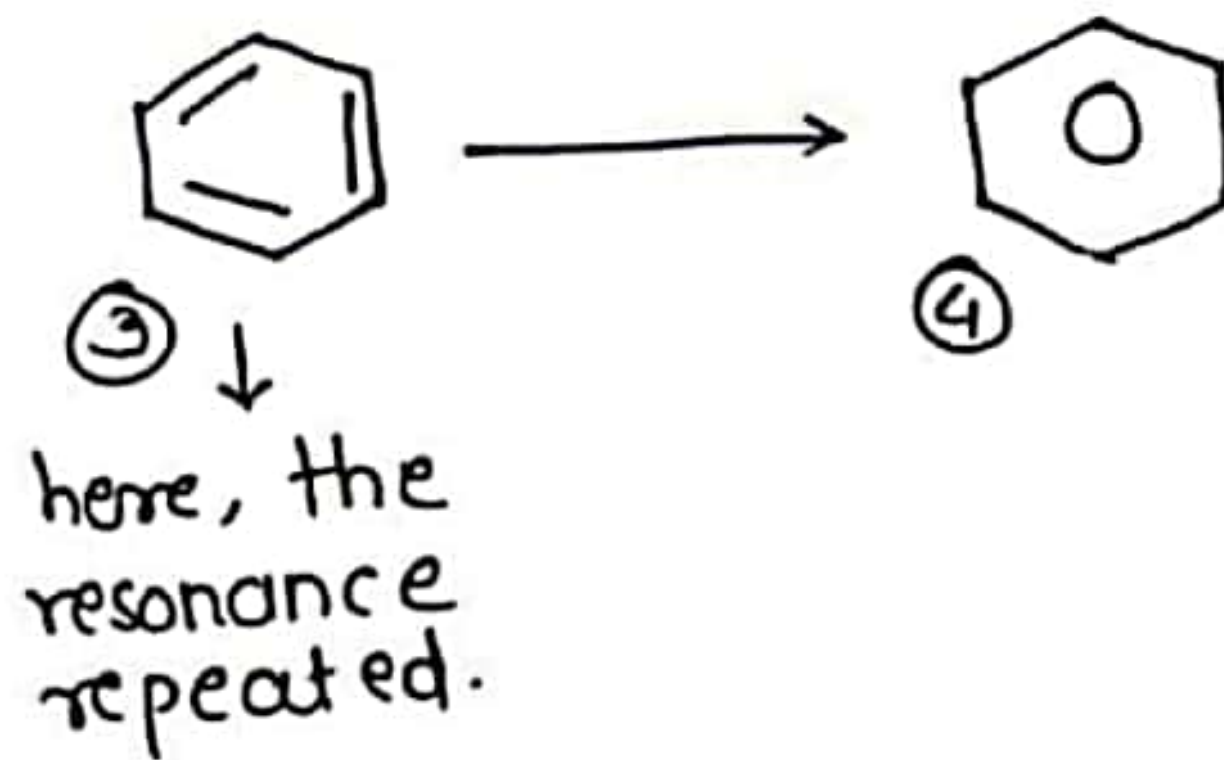
[DEPTH OF BIOLOGY] $C_1-C_2 \rightarrow 1.57A^\circ$

③ Resonance structure:

- Shifting of electrons from one place to another known as resonance.

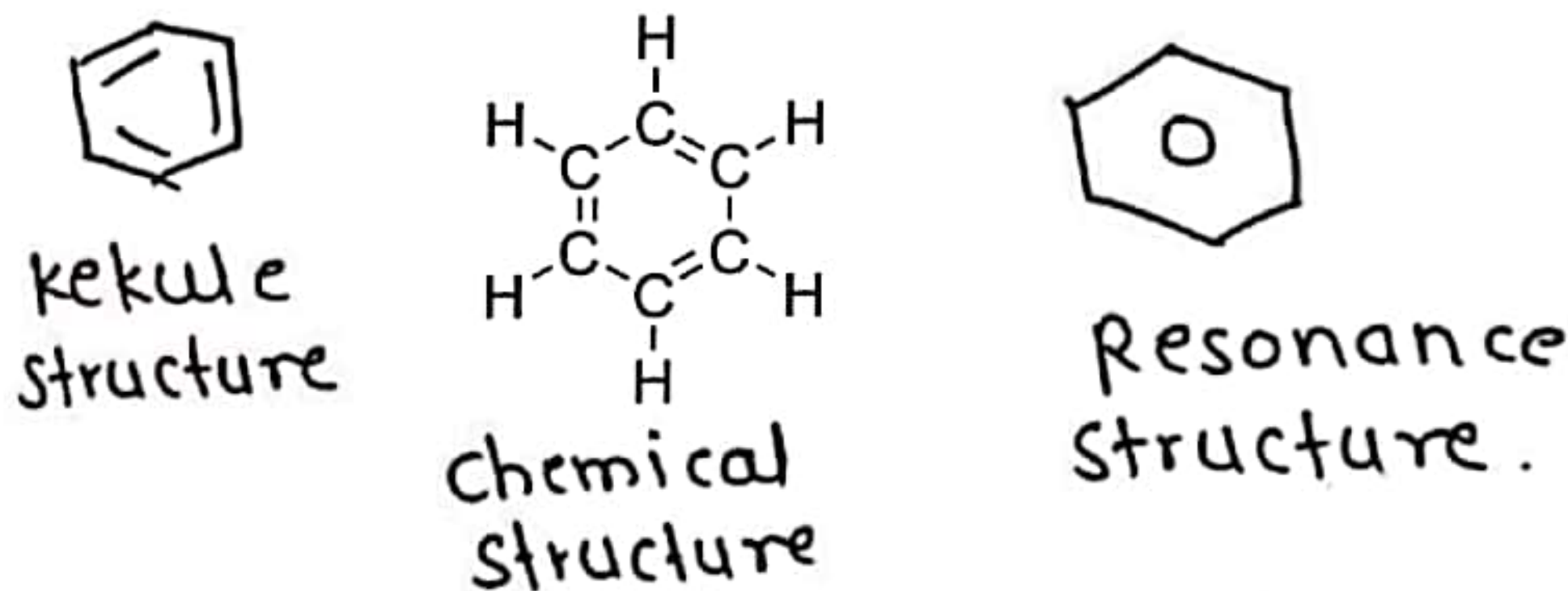


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- electrons shifts from one place to another known as resonance.

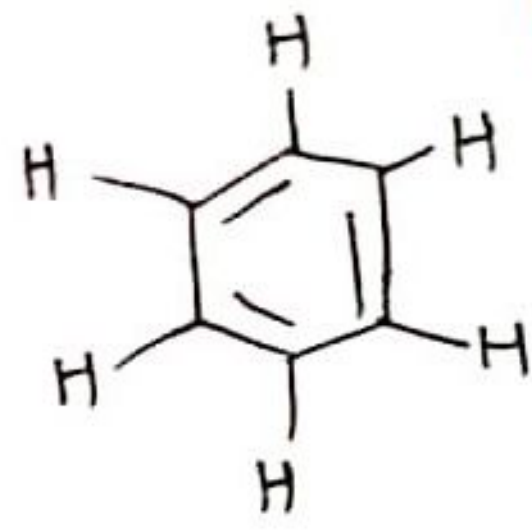
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- Benzene derivative:
- The compounds which are formed from Benzene are known as Benzene derivatives.

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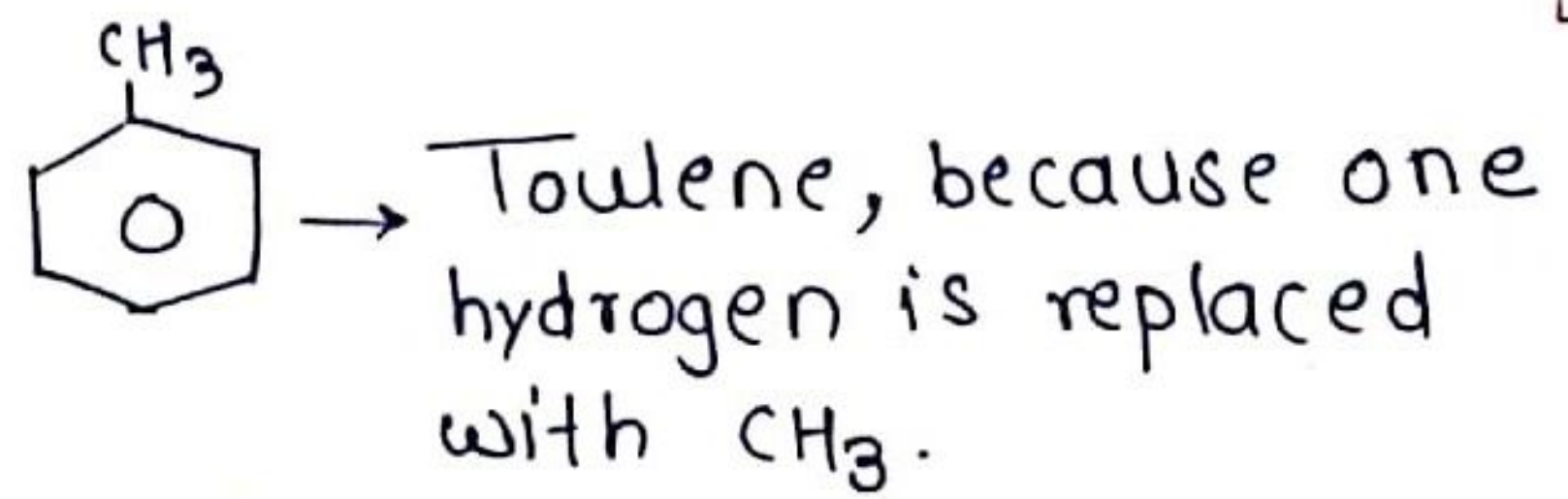
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• Replace 'H-atom' and attach other group.

• Replacement of '1-H' known as monosubstitution derivative

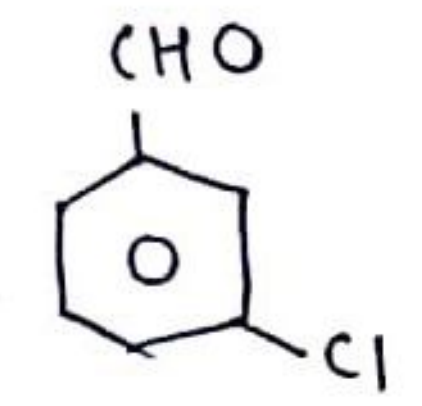
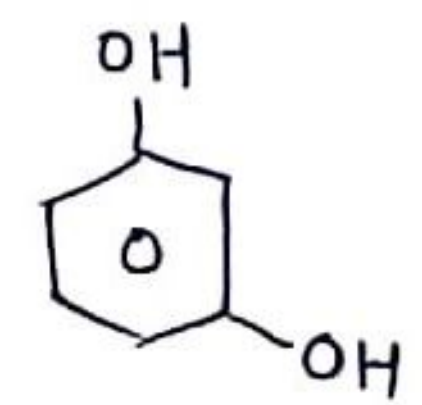
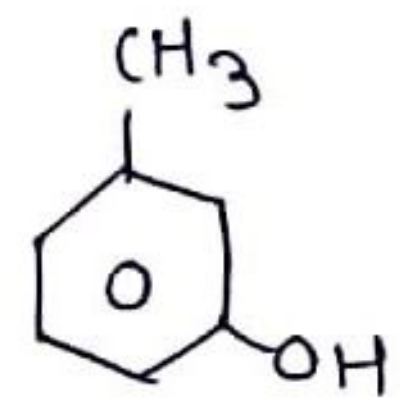
- eg: $\text{CH}_3 \rightarrow$ Toluene
- $\text{OH} \rightarrow$ phenol
- $\text{NO}_2 \rightarrow$ Nitrobenzene
- $\text{NH}_2 \rightarrow$ Aniline
- $\text{CHO} \rightarrow$ Benzaldehyde



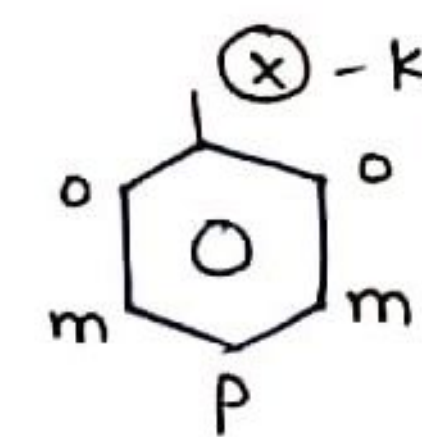
• Replacement of two Hydrogens known as Disubstitution derivative.

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here, two hydrogens are replaced.



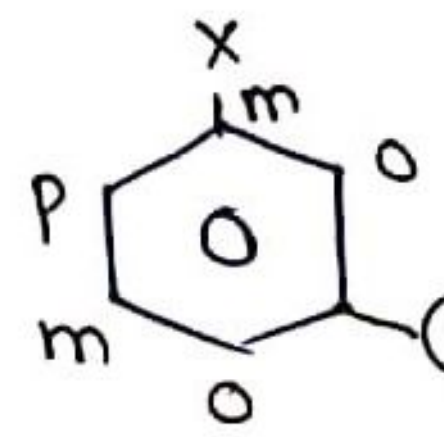
-key carbon
(-key carbon is a carbon which is big compound, here CHO is big so it is key carbon)

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- o - ortho position
- m - meta position
- p - para position.

• key carbon ke side wale ortho position & uske niche wale meta position and then last p-para position.

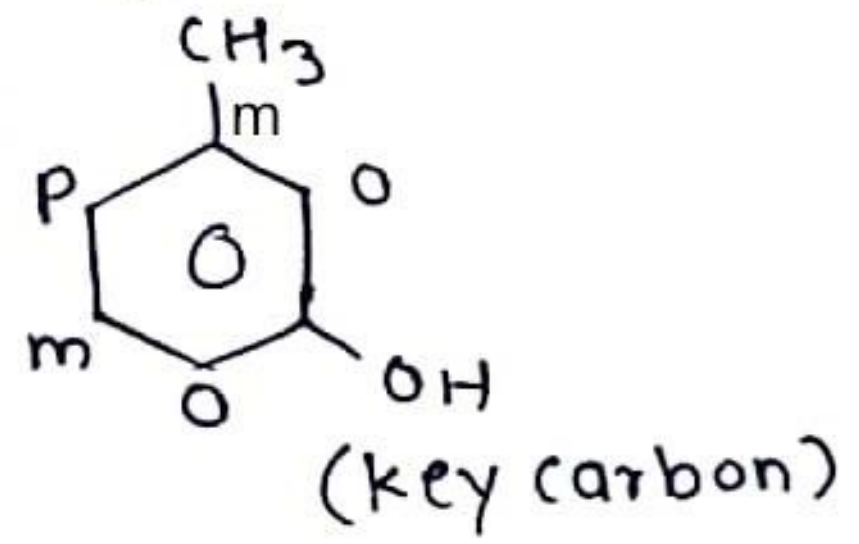


-key carbon (Bad group)

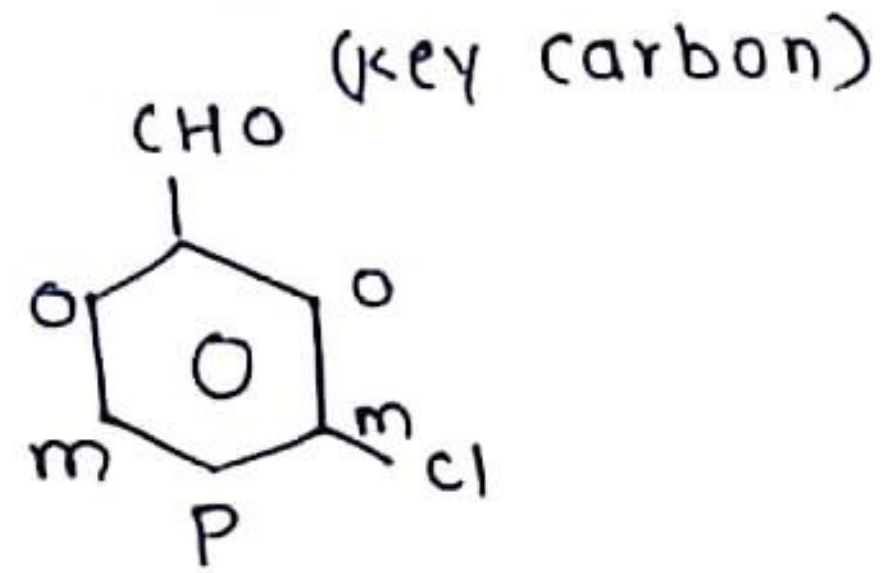
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• Ortho, para and meta positions are depends on key carbon.

eg: [DEPTH OF BIOLOGY]

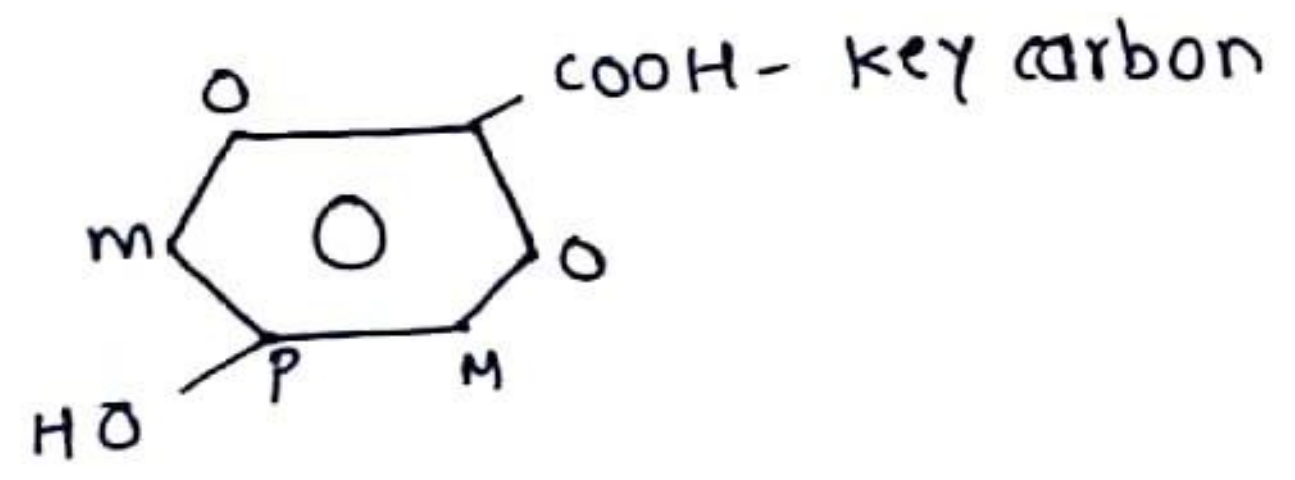


Metamethyl phenol



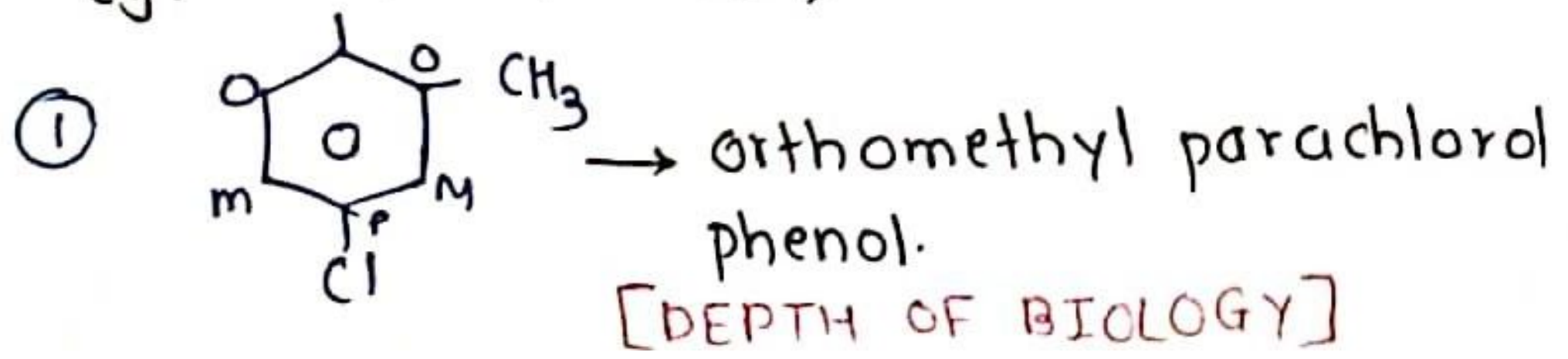
Meta-chloro Benzaldehyde.

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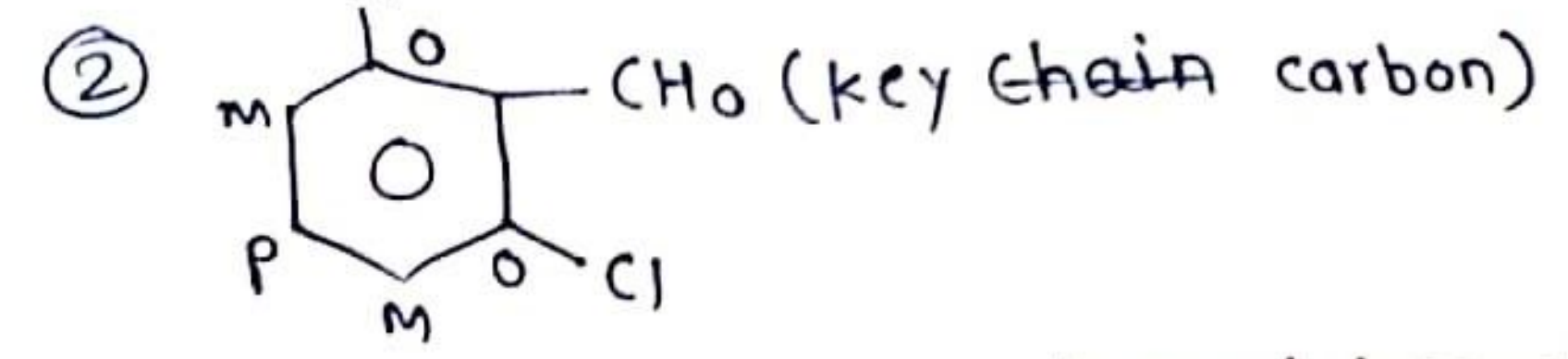


• More than 2 hydrogens replaced then those are known as poly substitution derivative.

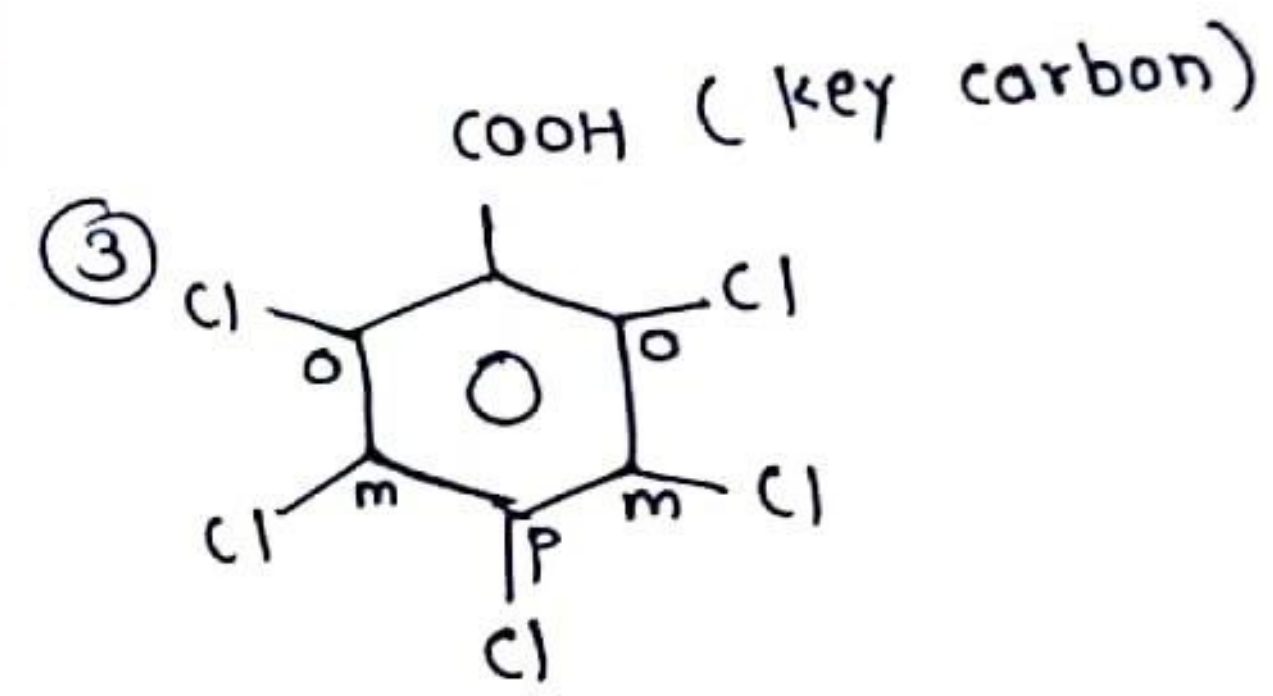
eg: OH (key carbon)



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Diortho-chloro p-hydroxyl benzaldehyde



Diortho, Dimeta, para pentachloro Benzoic acid.

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