

(31)

MARCH 2019
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11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
M T W T F S S

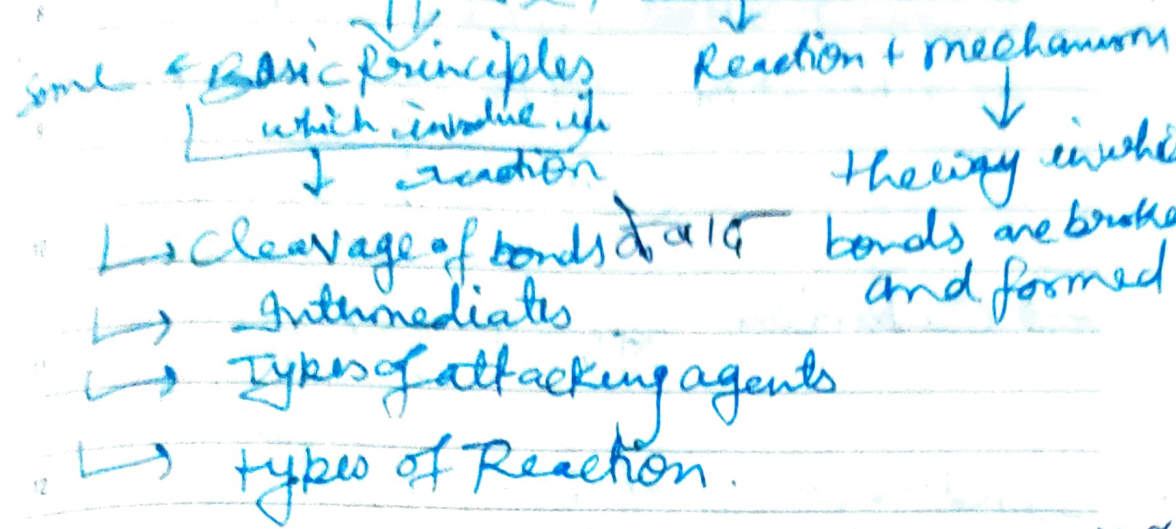
organic reactions and
Synthesis of a drug molecule

FEB
THURSDAY

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Unit - 2

fundamentals of Reaction mechanisms

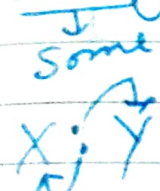


Bond fission:

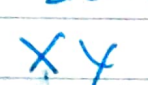
Cleavage

Homolytic fission

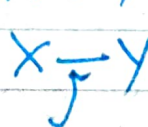
Heterolytic fission



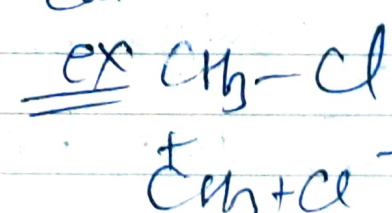
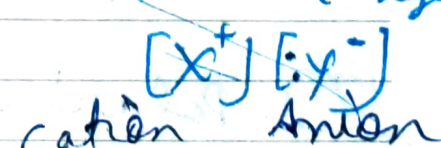
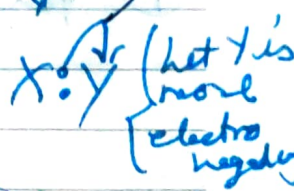
covalent bond sharing of equal



Free Radical



ethane CH_3-CH_3



Intermediates

- ① free Radical
- ② Carbocation
- ③ Carbanion

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FRIDAY

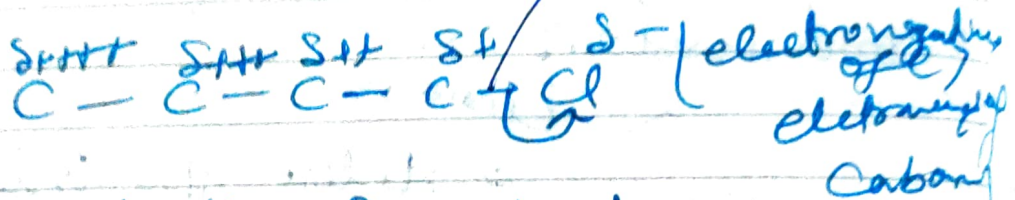
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WE	M	T	W	T	F	S	S

Intermediates Stability

- Free Radical $\propto +I$ (inductive effect)
- Carbocation $\propto +M, +H, +I$ group
(mesomeric > hyperconjugation, inductive effect)
- Carbanion $\propto M, -I$ groups

Inductive Effect: -



- ① Polarisation of one bond due to polarisation of adjacent bond
↓
transmission effect.

- ② Polarisation - Permanent → Permanent effect
- ③ only σ bond involved (not π bond electron)
- ④ decreases with distance

Types of inductive effect

This is two type -

- (i) $+I$ effect
- (ii) $-I$ effect

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2015

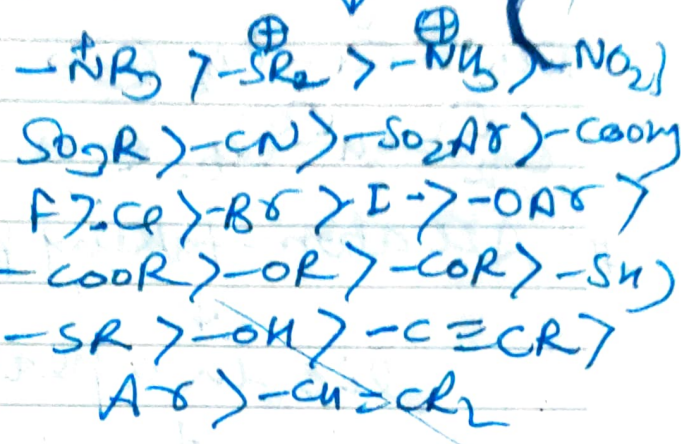
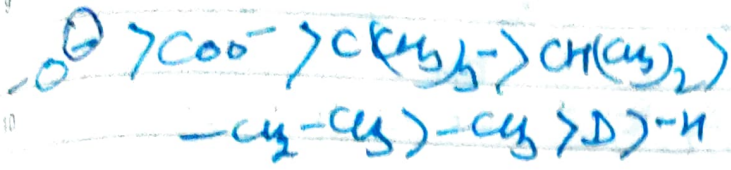
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Inductive effect:-

plus $\rightarrow$ Add $\rightarrow$ Release
 $\downarrow$
 group which release electron cloud

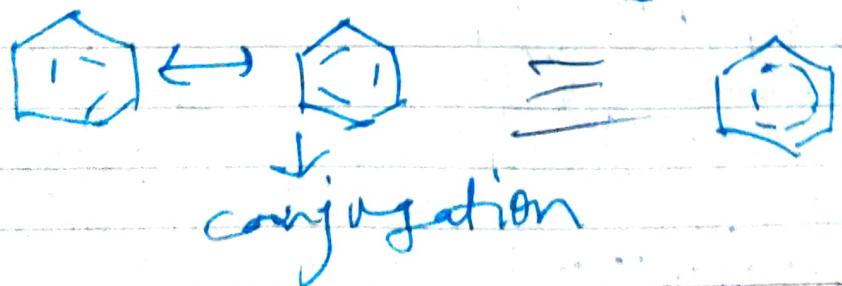
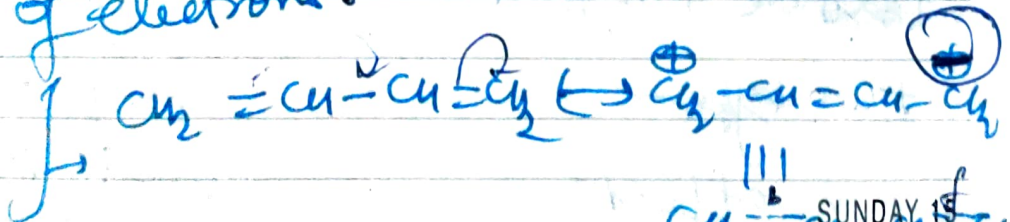
-I effect
 minus $\rightarrow$ group withdraw electron density from adjacent carbon



Resonance:-

two or more structure

$\downarrow$
 differ only in the distribution of electrons.



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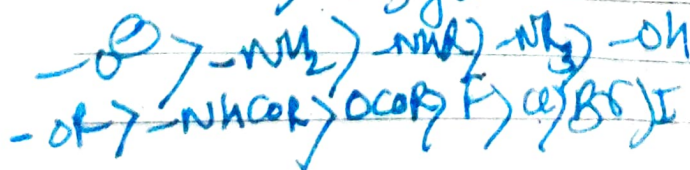
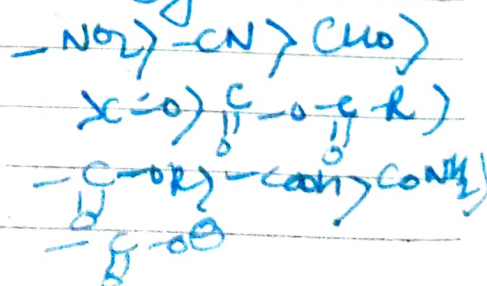
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Wk	M	T	W	T	F	S	S

Conjugation: -Resonating str.

All atoms taking part in delocalisation

↓
lie in a plane, sp^2 hybridized↓
orbitals overlapping become parallel to each other. (planar)4 Resonance effect or mesomeric effect5 Positive +m effect

two types -

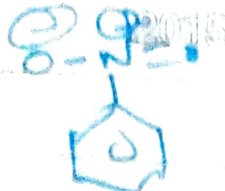
+m effect
group + donate
electron to the
conjugated
systemnegative
-m effectgroup withdraw
electron from
the conjugated
system

C≡N sp⁸⁰ % electronegativity

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M	T	W	T	F	S	S	M	T	W	

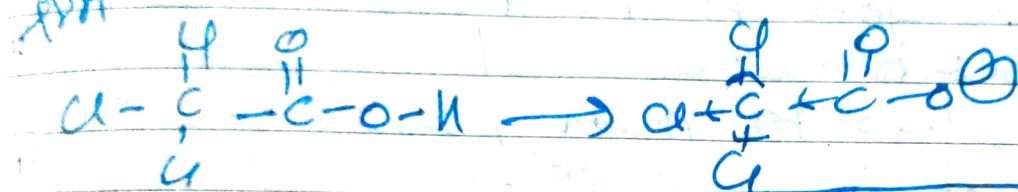
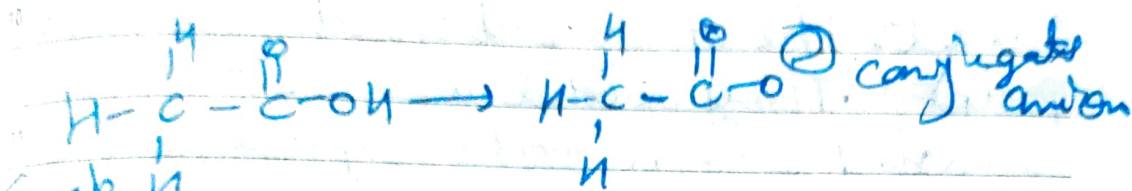
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Ques ① explain the following

Trichloroacetic acid is stronger acid than acetic acid



acidic character $\propto$ -I power of gp

there is one +I gp this gp increases electron density over the oxygen atom so the removal of hydrogenase proton from acidic acid is difficult.

Ques ② The amino gp in aniline is ortho & para directing but amide gp is meta directing why? electrophilic substitution reaction

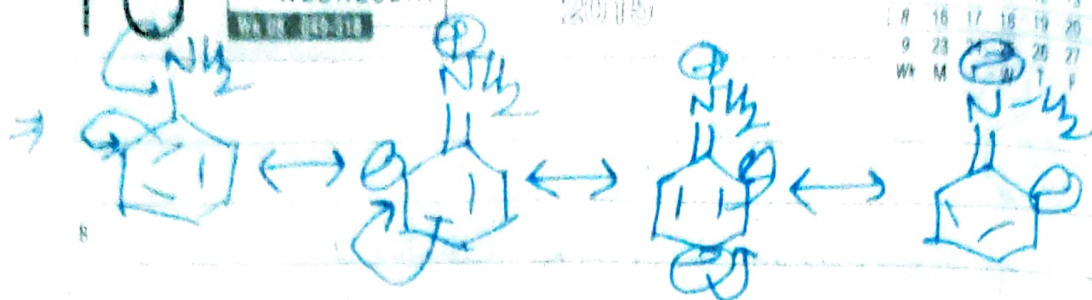
Ans ortho & Para directing gp: $\rightarrow$ This

gp directs the incoming electrophile at ortho & para position this increases the electron density on the ortho & para position. Thus this creates room for attacking electrophile.

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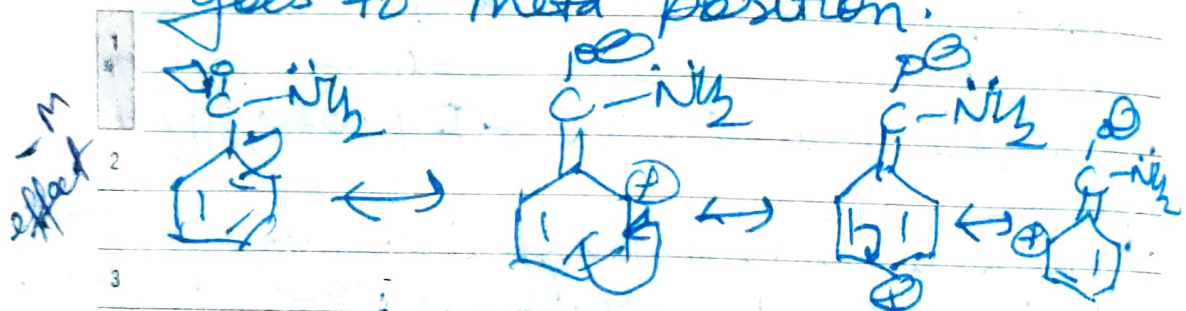
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10	M	T	W	T	F	S	S



meta directing group:- This group

directs the other Substitution at meta position. They withdraw the electron density from ortho & para position therefore the meta position is the electron rich and the electrophile goes to meta position.



Hyperconjugation:-

delocalisation of σ e^- with p-orbital

- ↓
- Alkenes
 - Alkynes
 - Carbocation
 - free Radical
 - Benzene ring

