

ALDEHYDES & KETONES

16/06/2023

classmate

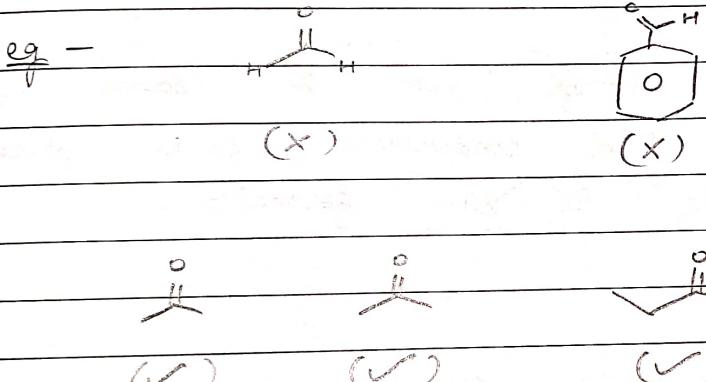
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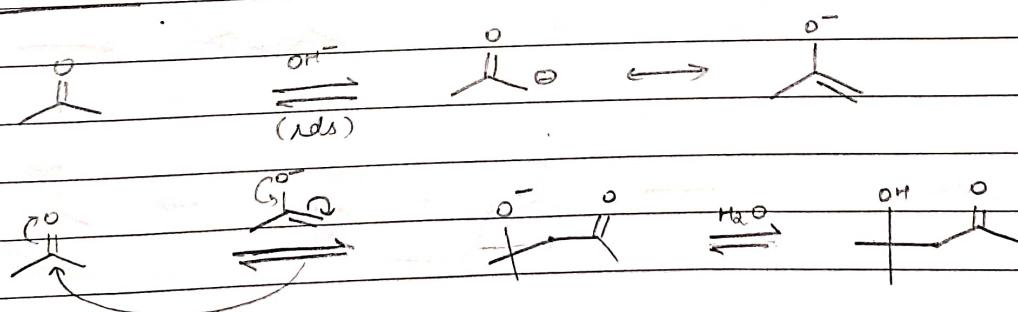
ALDOL CONDENSATION

Cond': Aldehyde or Ketone - having at least one α - Acidic Hydrogen

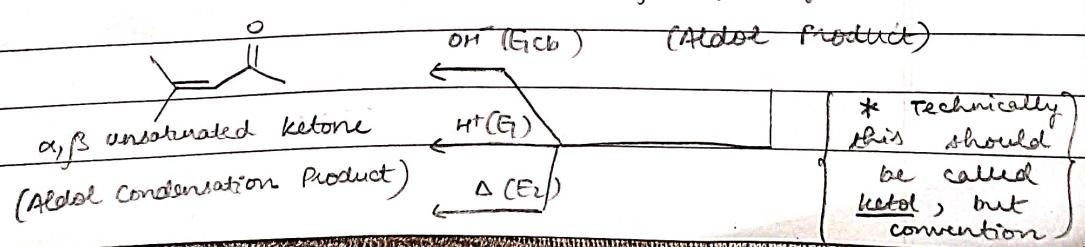
Medium → Acidic - H^+ , conc. H_2SO_4 , H_2SO_4
 Medium → Basic - OH^- , $NaOH$, dil. $NaOH$, KOH ,
 $Ca(OH)_2$, $Ba(OH)_2$, Na_2CO_3 , K_2CO_3



→ Mechanism (Basic Medium)



β-hydroxy ketone

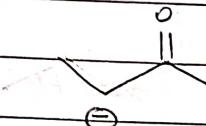


* Technically
this should
be called
ketol, but
convention

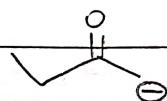
NOTE: 1. ThD Product - Stability of enolate ion

Kinetic Product - Stability of C^-

eg



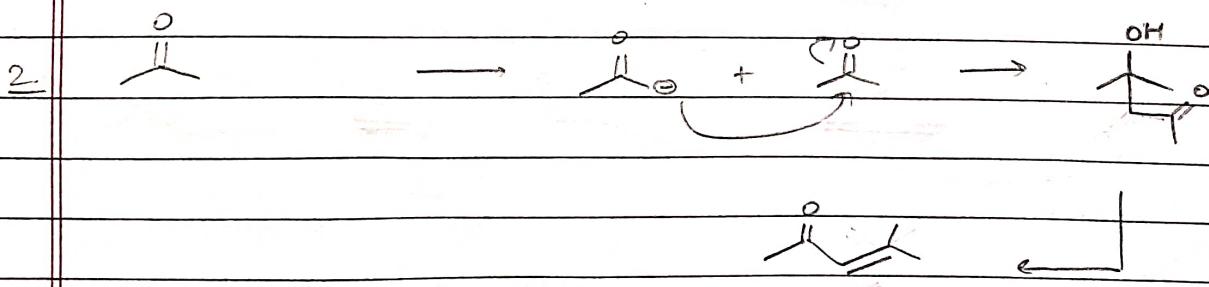
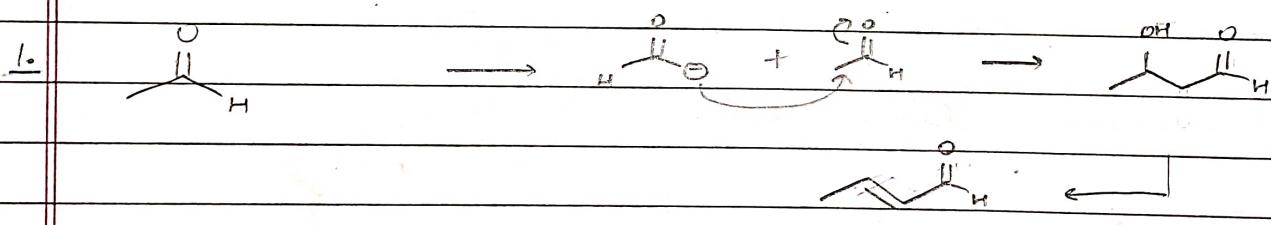
(For ThD product)

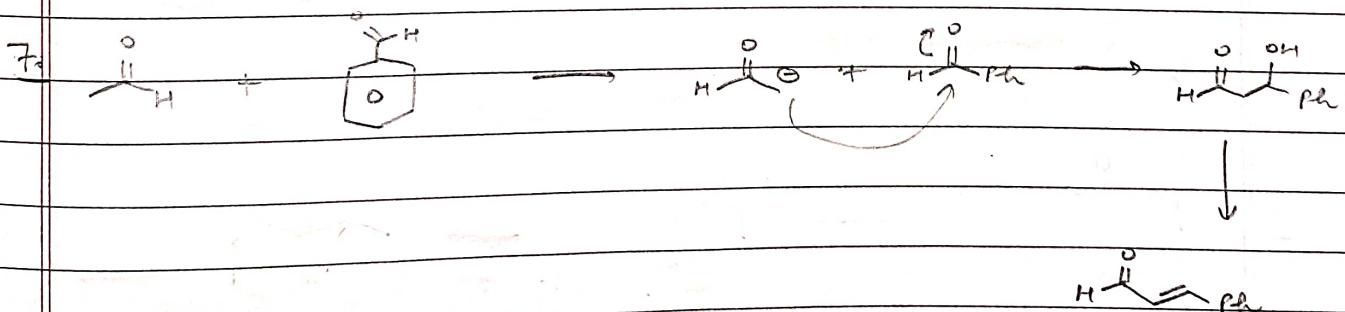
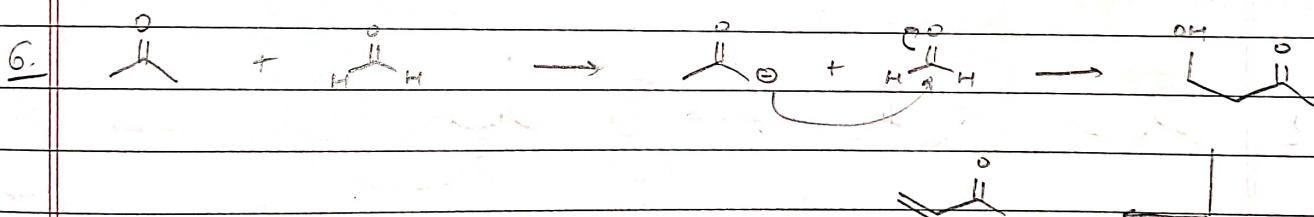
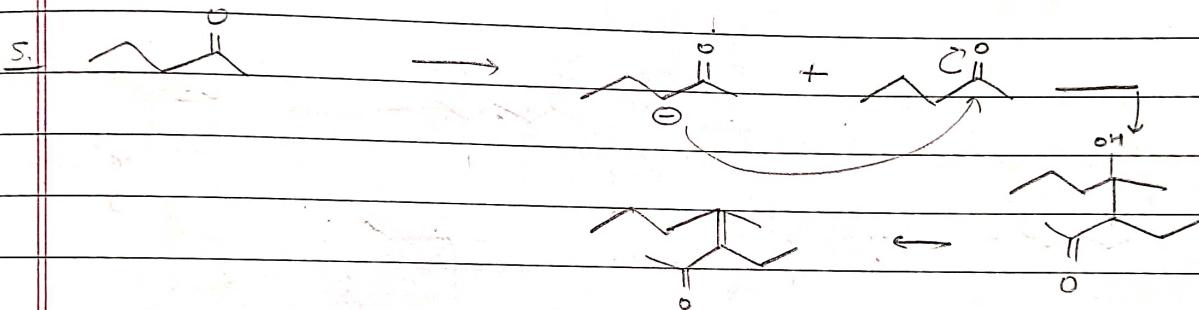
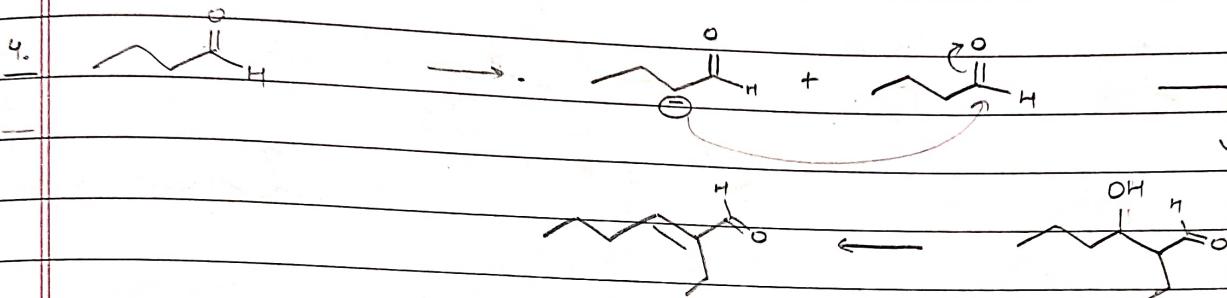
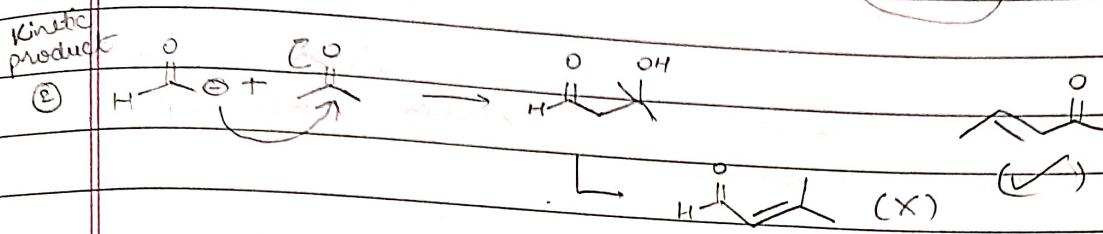
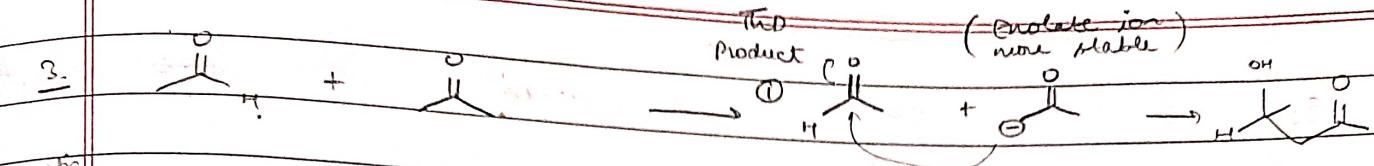


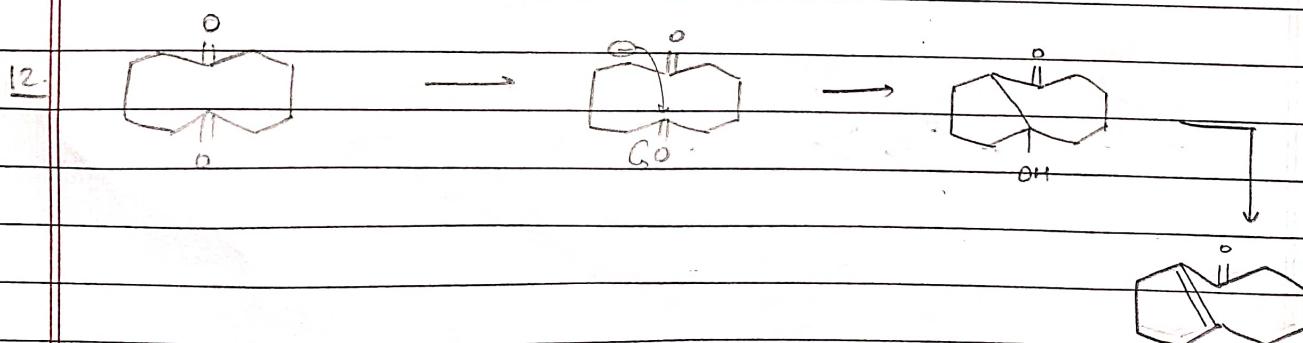
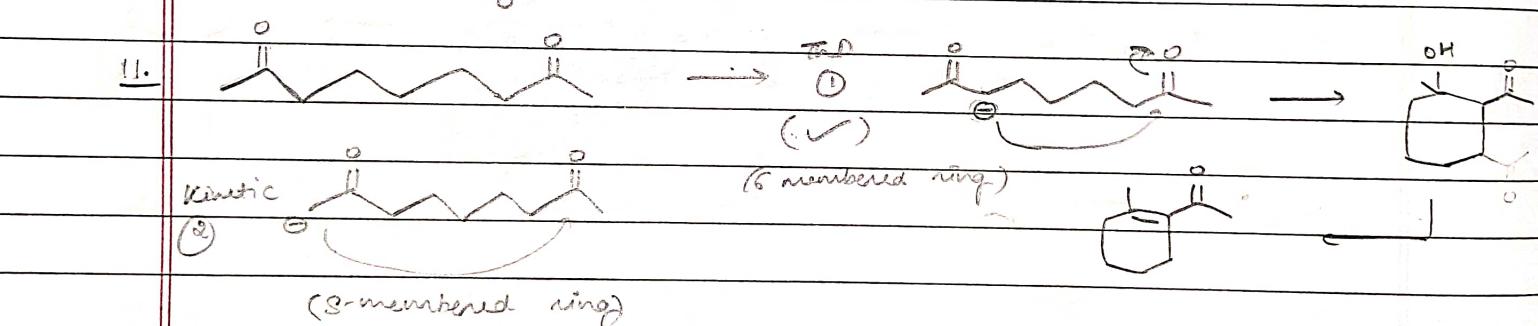
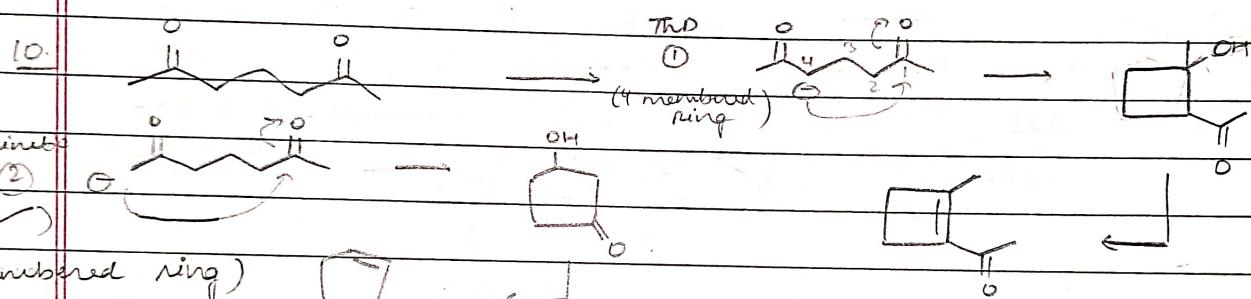
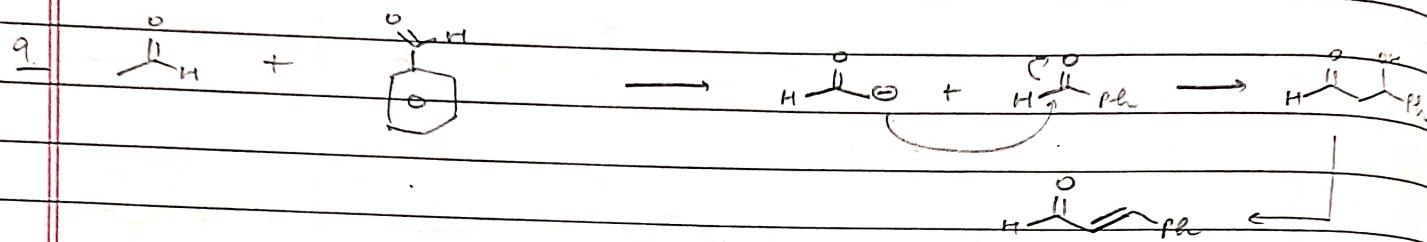
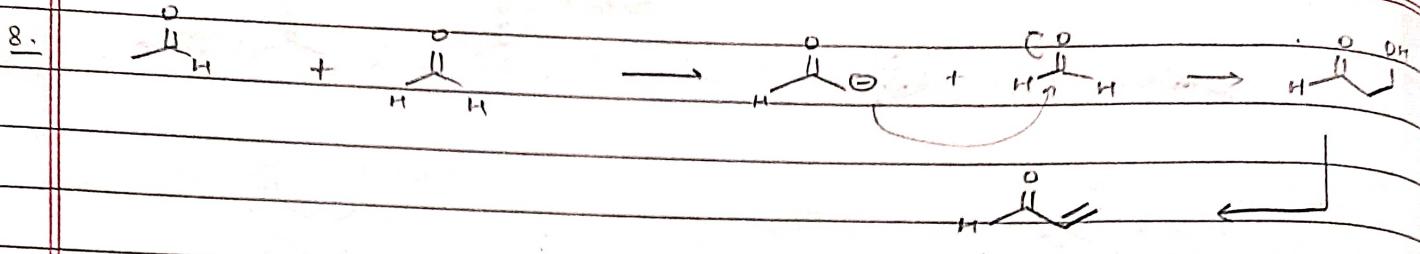
(for Kinetic product)

2. When 2 carbonyl grp's in same comp, intramolecular Aldol condensation takes place which results in ring formation.

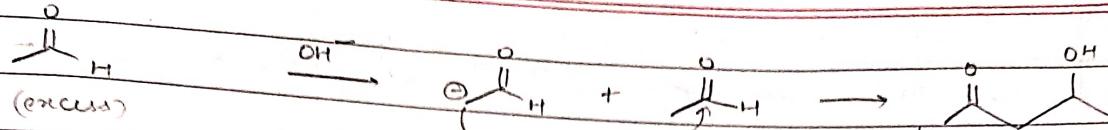
Q. Write mechanism & product.



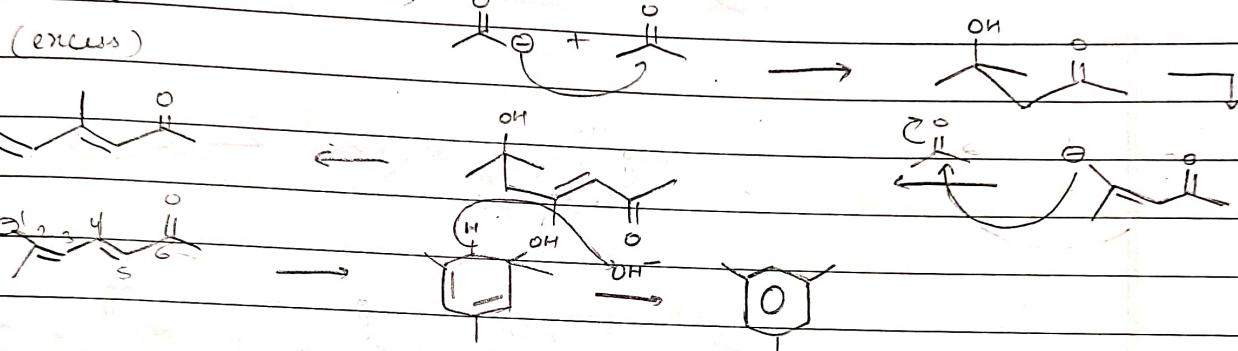




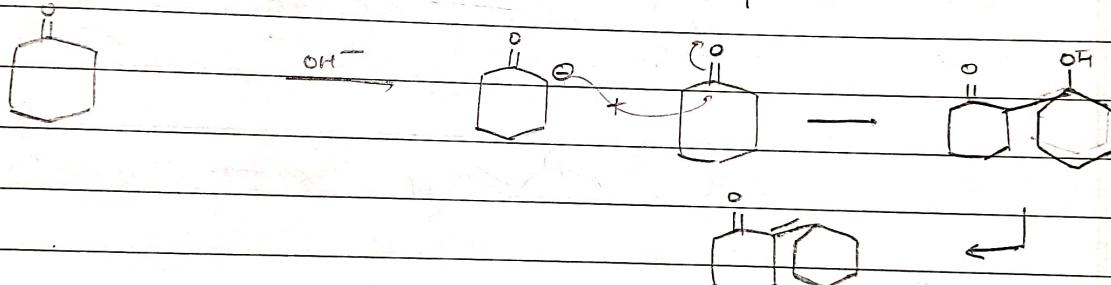
★ 13.



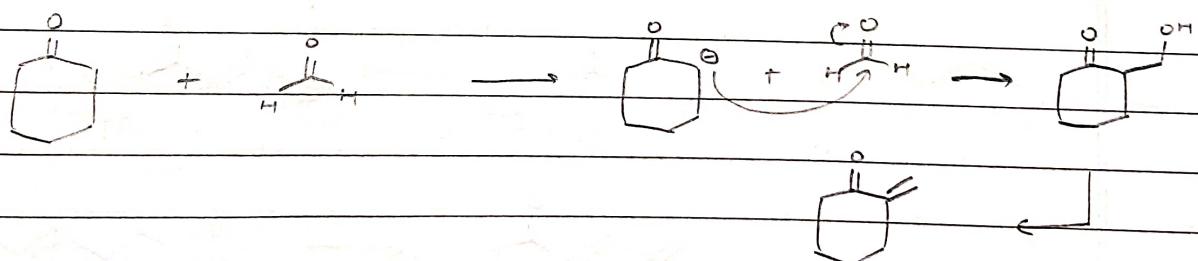
★ 14.



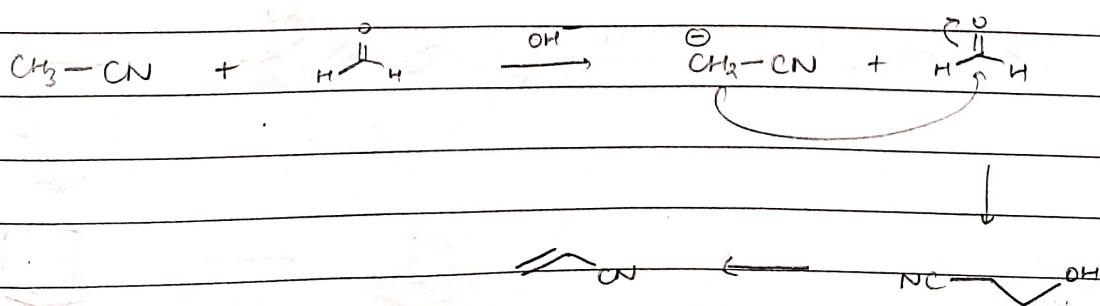
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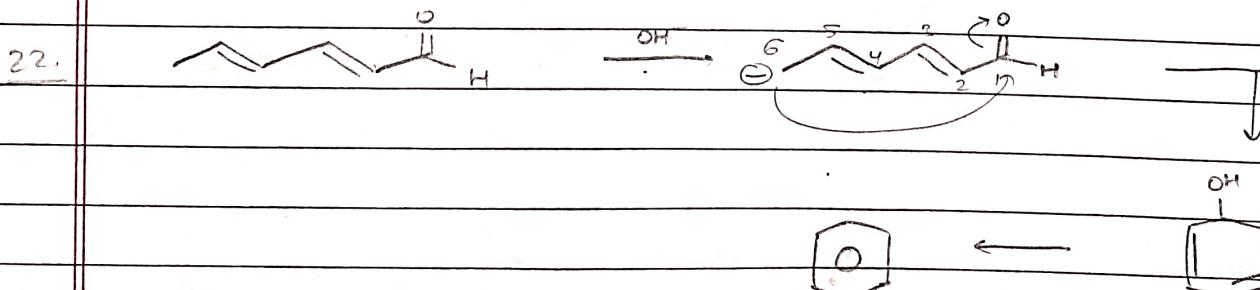
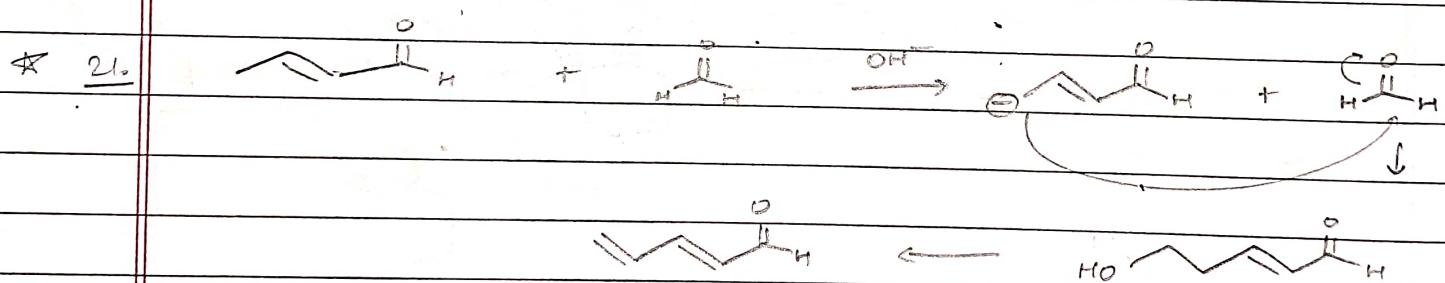
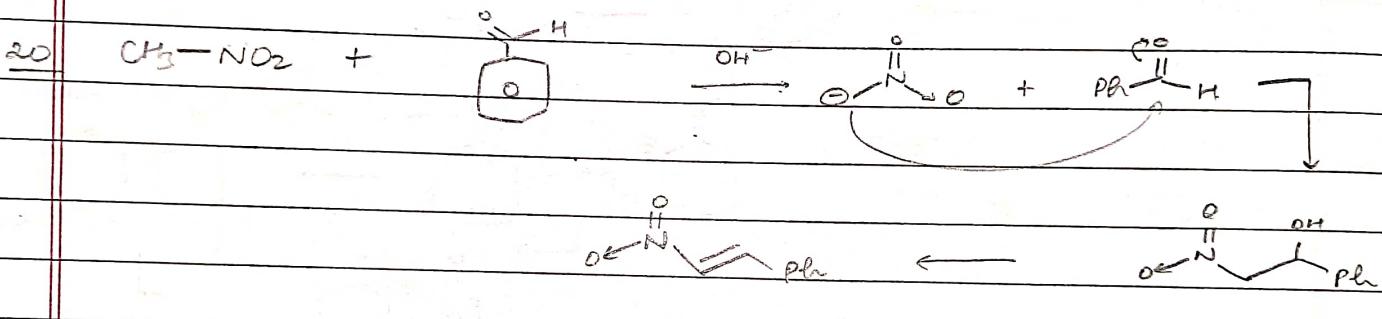
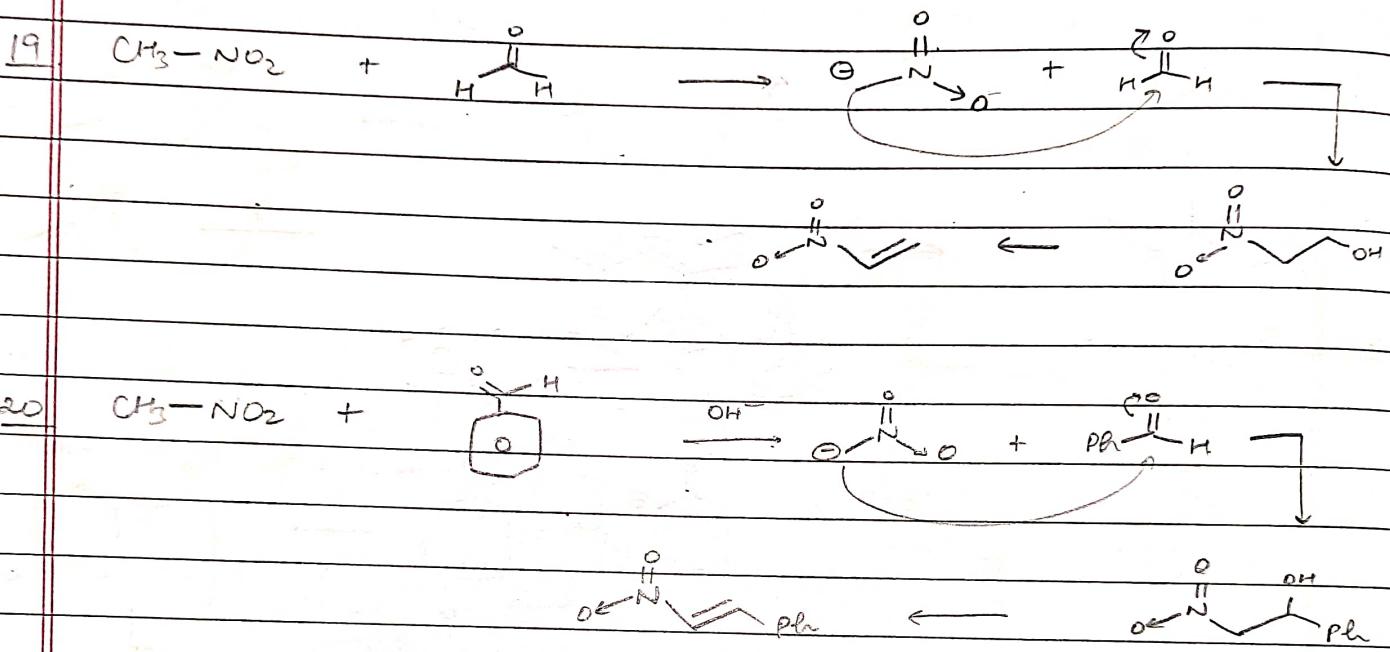
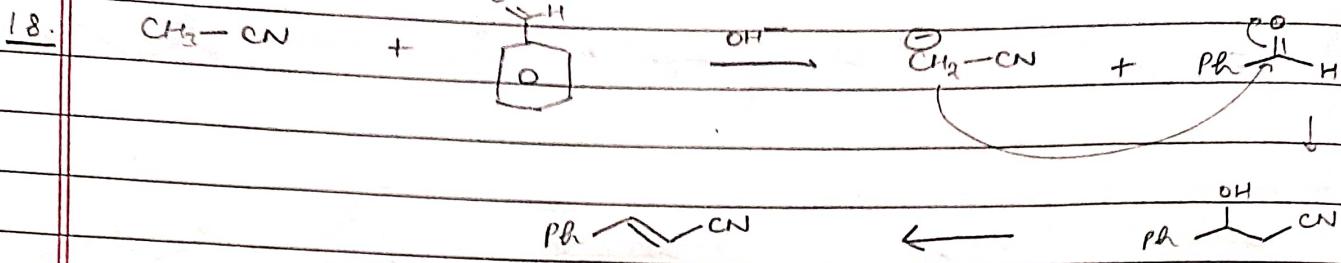


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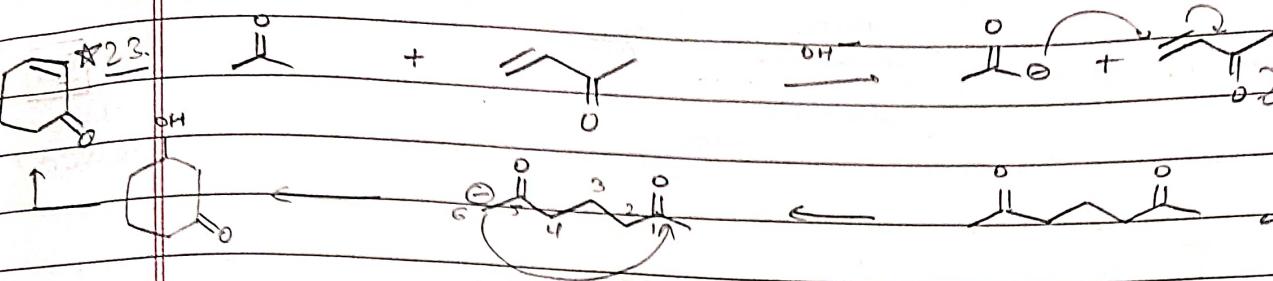


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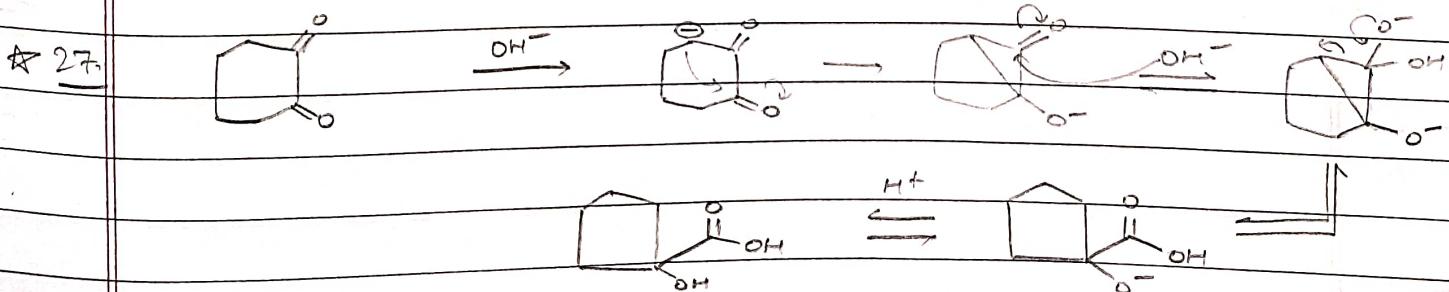
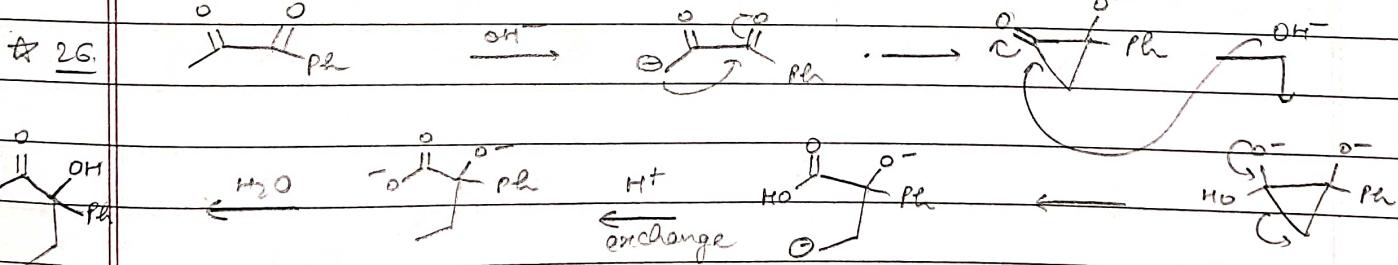
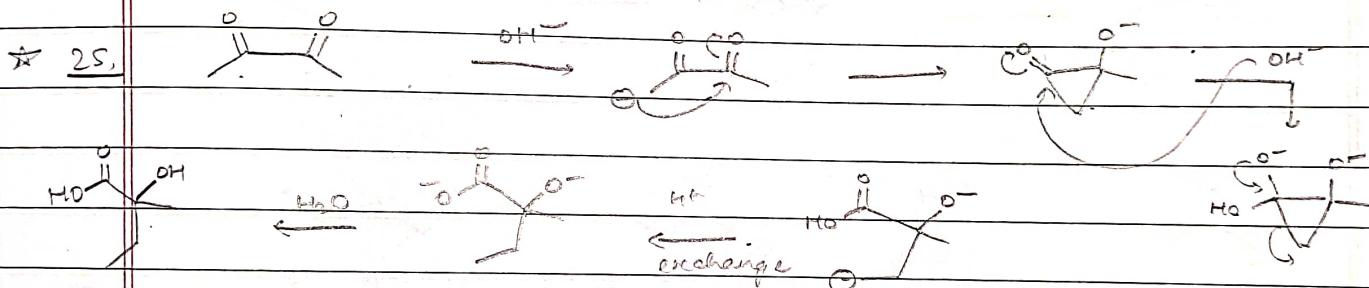
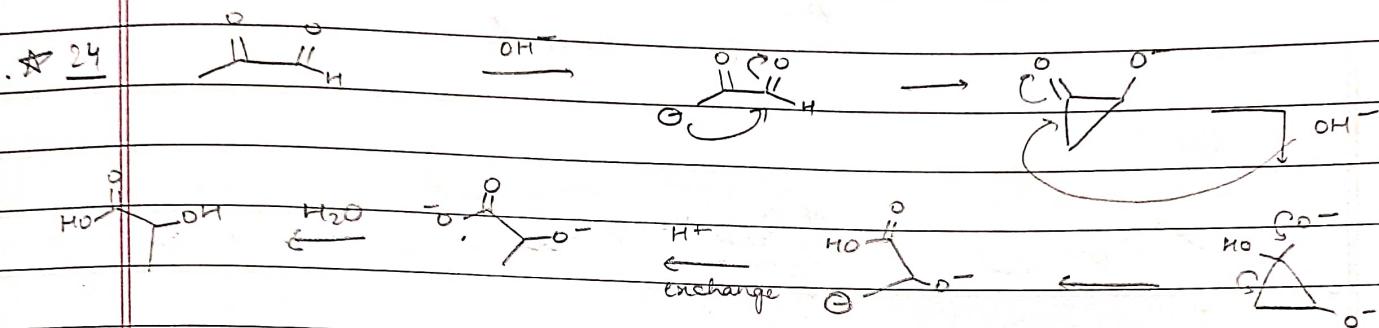




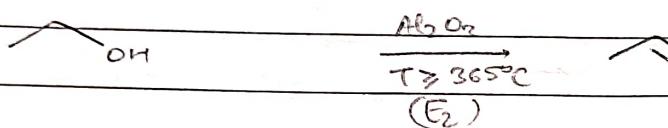
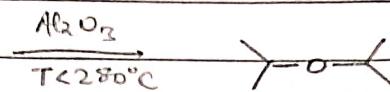
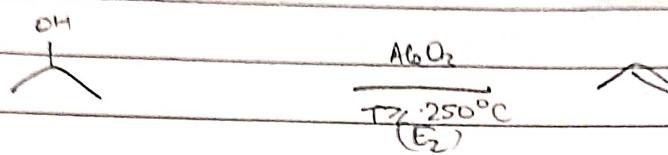
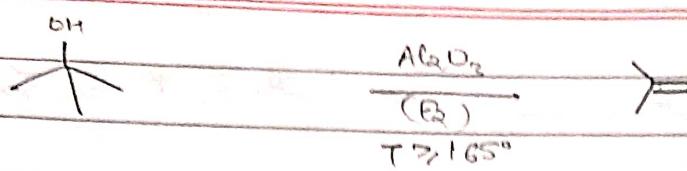
(R I)



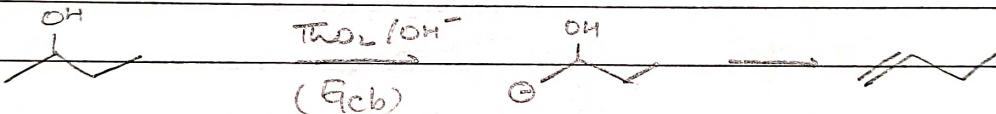
(R II)



NOTE: ①



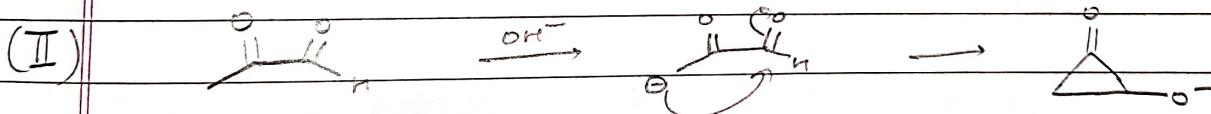
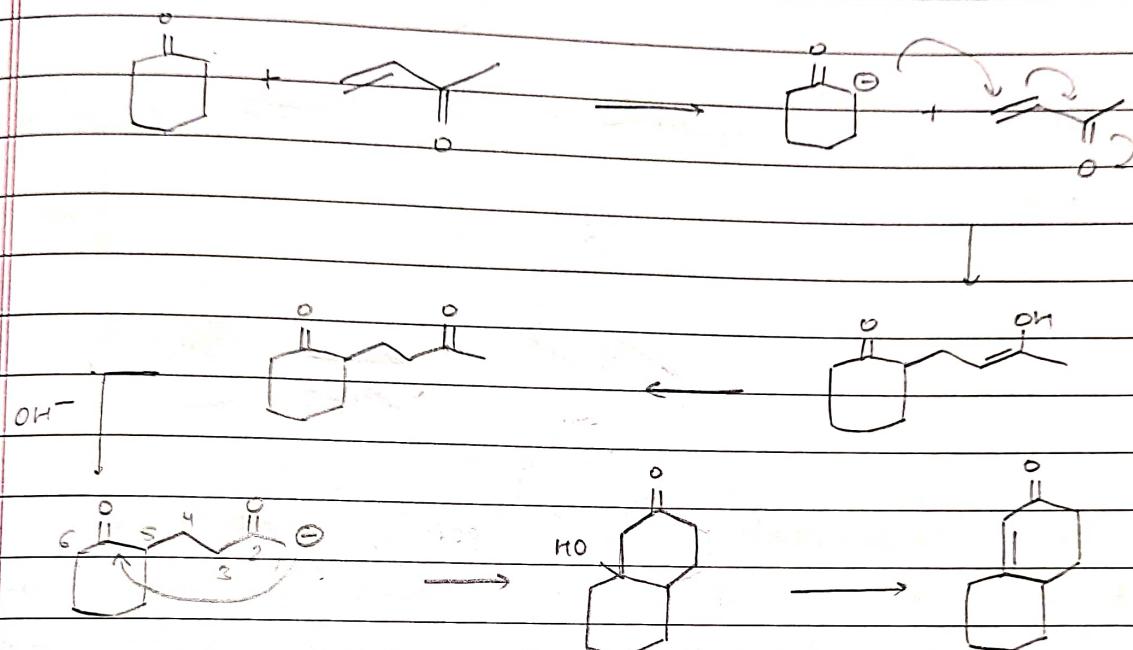
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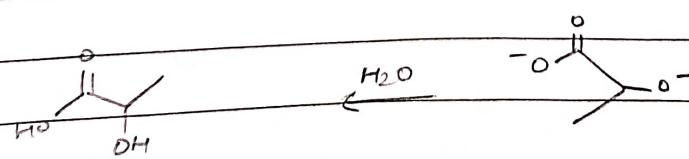
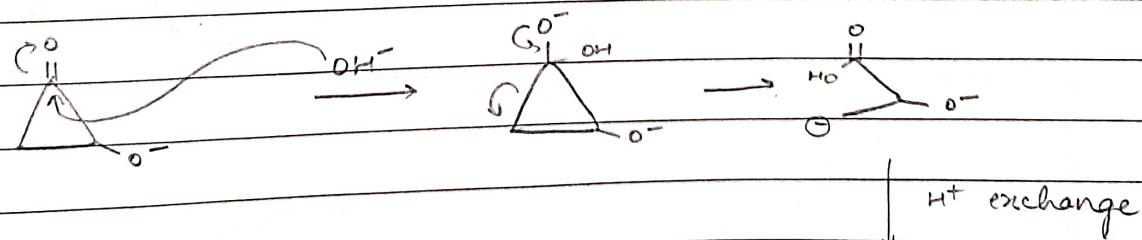
REMARKS:

(I) Robinson Annulation

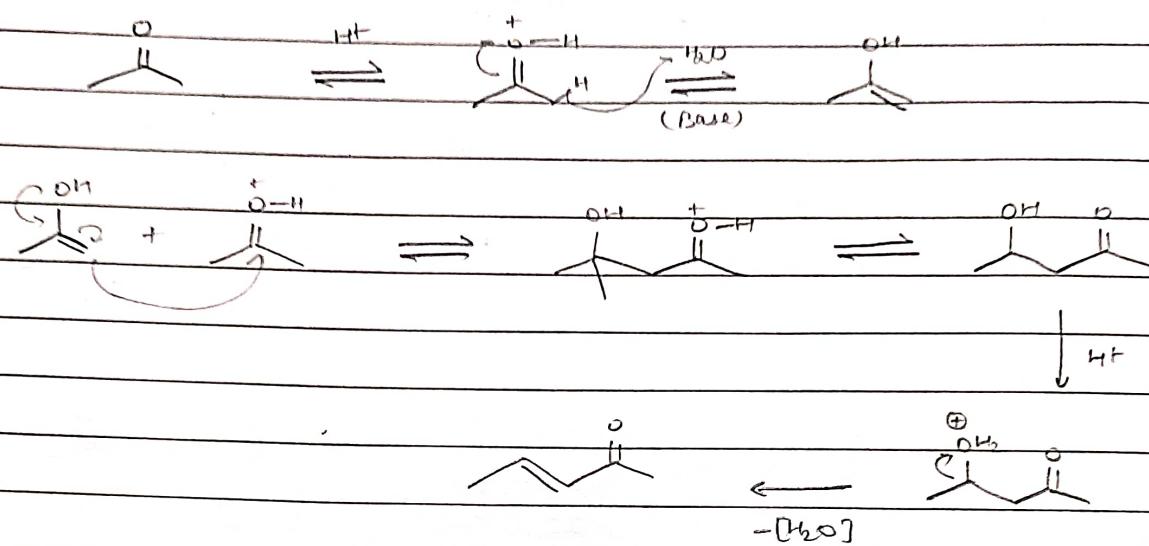
= Michael Aldolⁿ + Aldol Condensation
(1,4 Aldolⁿ)



Whenever such triangular cyclic intermediate found, Nü oddⁿ or subⁿ by OH⁻



→ Mechanism (Acidic medium)



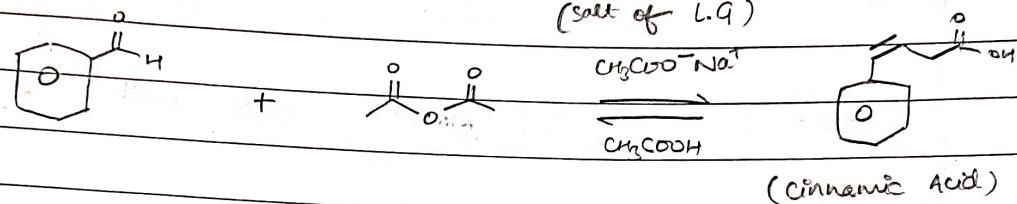
NOTE: Aldol condensation in acidic medium is better than that in basic medium as base has tendency to remove acidic -H & form product kinetically.

In acidic medium however, yield of kinetic product is less.

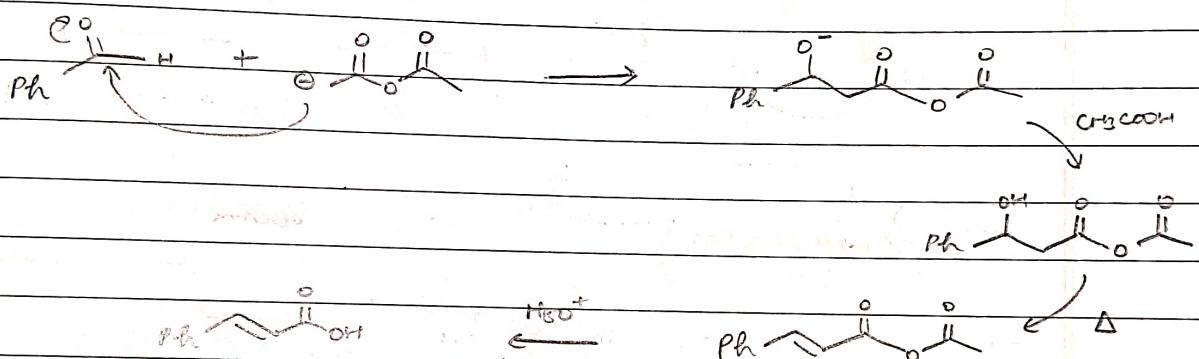
PERKIN REAK

Condⁿ: Non-enolic Aldehyde

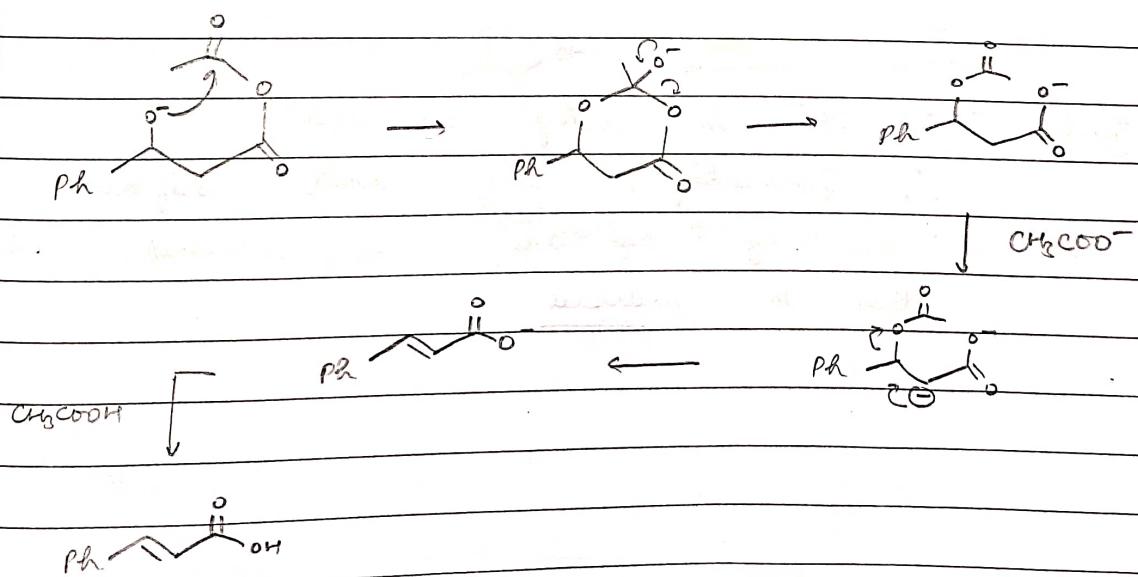
* This is taken at.
Nu addⁿ on $\text{C}_6\text{H}_5\text{CH}_2^+$
does not take place



Mechanism



This mechanism is not correct.

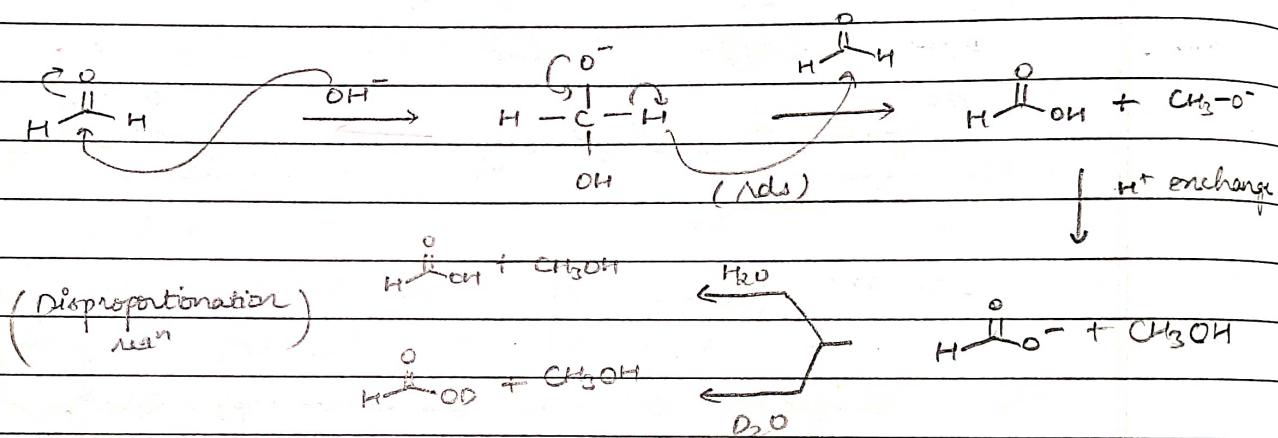


CANNIZARO'S REAⁿ

Condⁿ : 1. Aldehyde with no α -acidic H
2. In ads, $\text{H}^{\ddagger}\text{O}^-$ should transfer

Reagents : 50% NaOH, 50% KOH, NaOH, KOH, OH^-

Case I: Normal conc. of OH^-



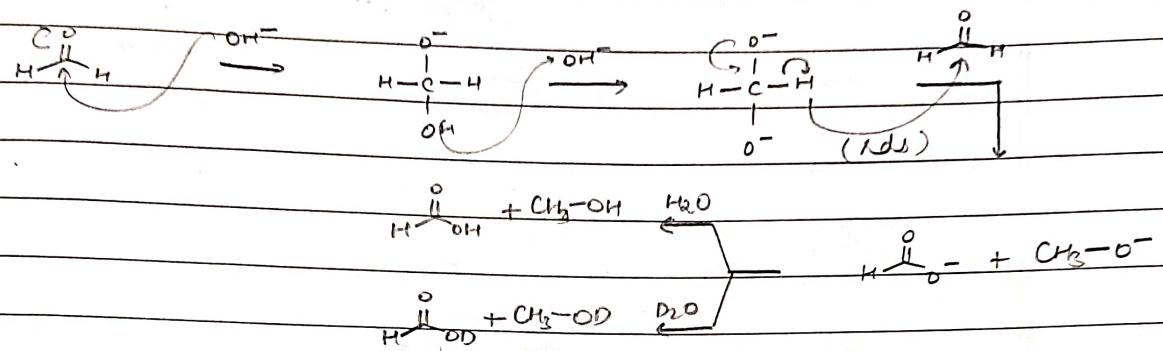
NOTE: ROR \propto $[\text{H}^{\ddagger}\text{O}^-]^2 [\text{OH}^-]^4 \Rightarrow$ Order = 3

Trick : $\because \text{OH}^-$ is doing Nü addⁿ.

\therefore Generally, comp with higher

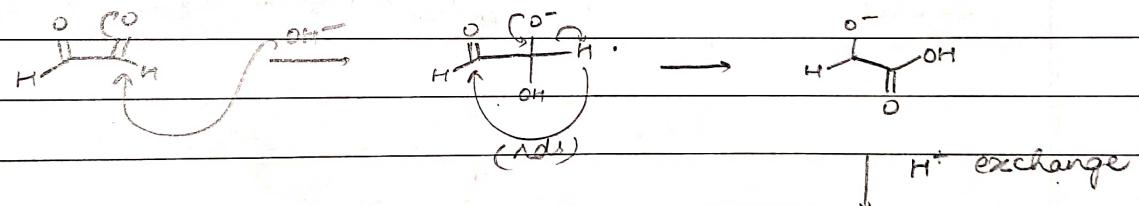
rate of Nü addⁿ is oxidised, while
other is reduced

Case II : Higher conc. of OH^- (eg - 50% NaOH)



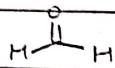
NOTE: $\text{ROR} \propto [\text{H}_3\text{C}^\ddagger\text{H}]^2 [\text{OH}^-]^2 \Rightarrow \text{order} = 4$

Case III : Intramolecular reacⁿ

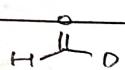


NOTE: $\text{ROR} \propto [\text{H}_3\text{C}^\ddagger\text{H}] [\text{OH}^-] \Rightarrow \text{order} = 2$

Q. Write mechanism (both normal & conc. cases)



(i)
(ii) \longrightarrow



OH^-
 H_2O

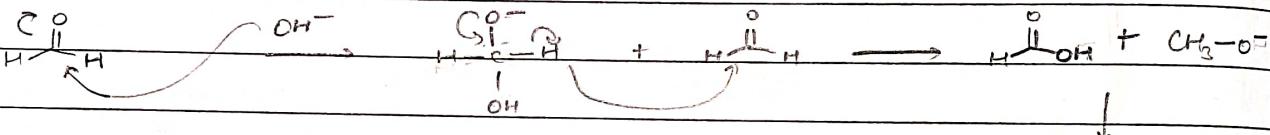


OD^-
 H_2O

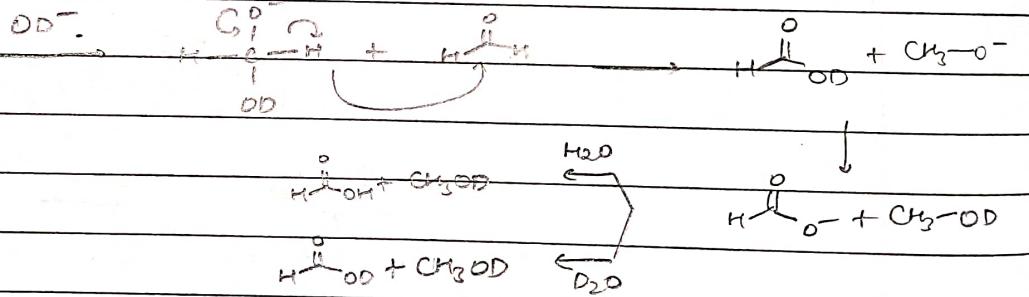
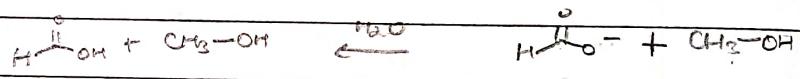


OD^-
 D_2O

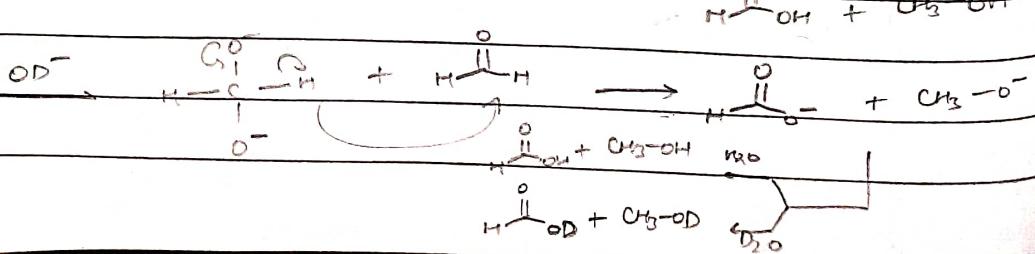
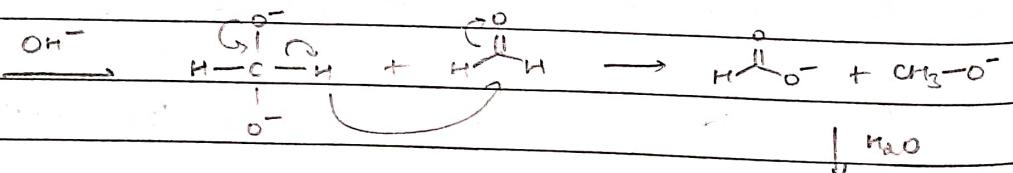
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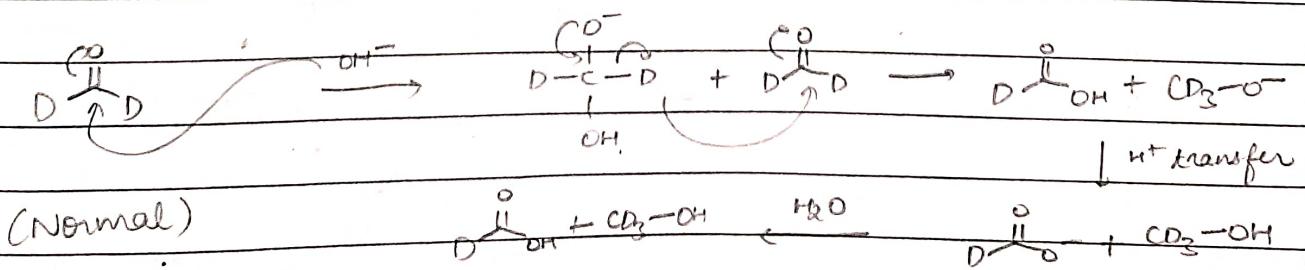
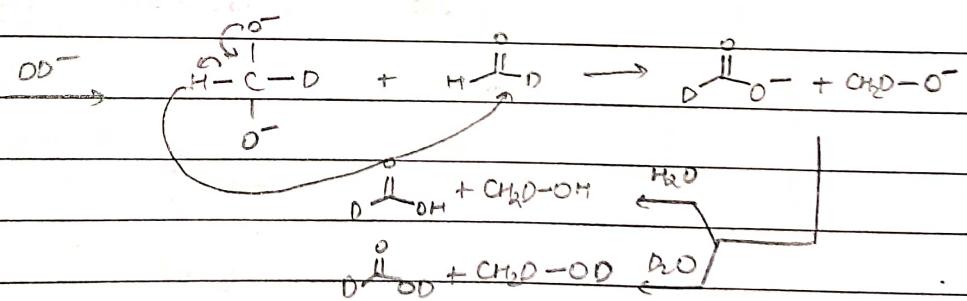
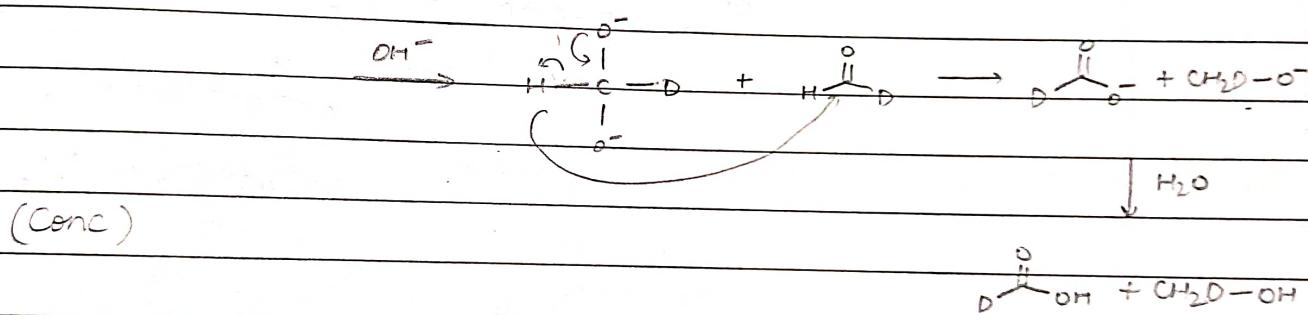
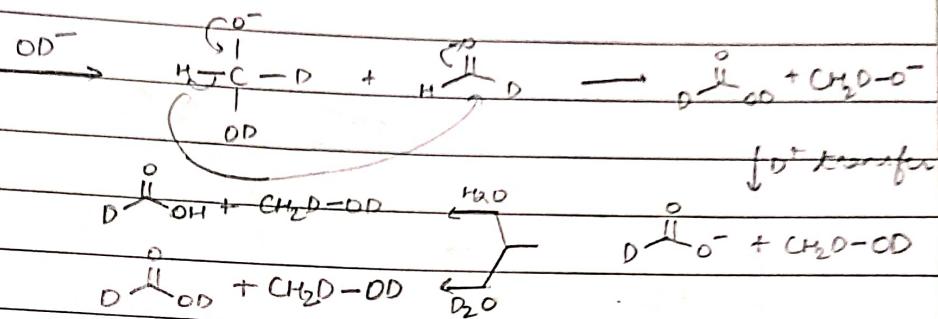
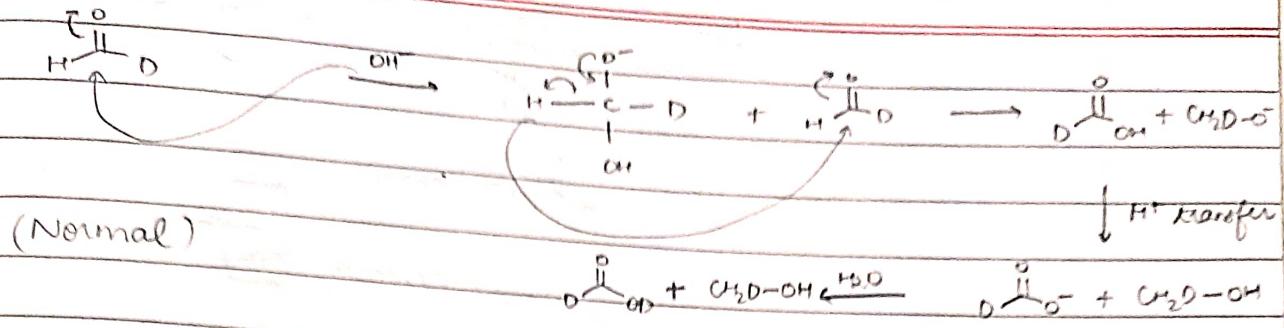


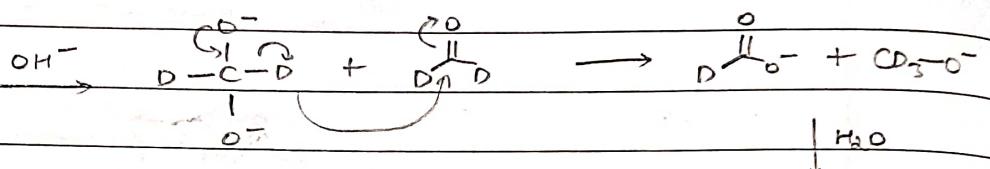
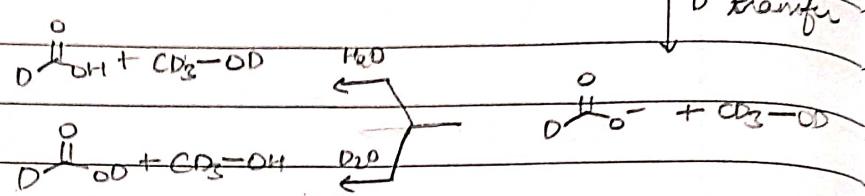
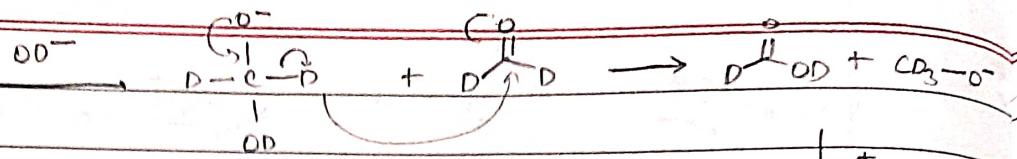
(Normal)



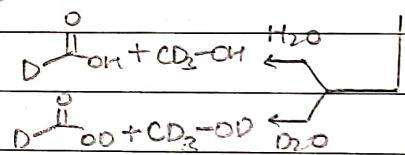
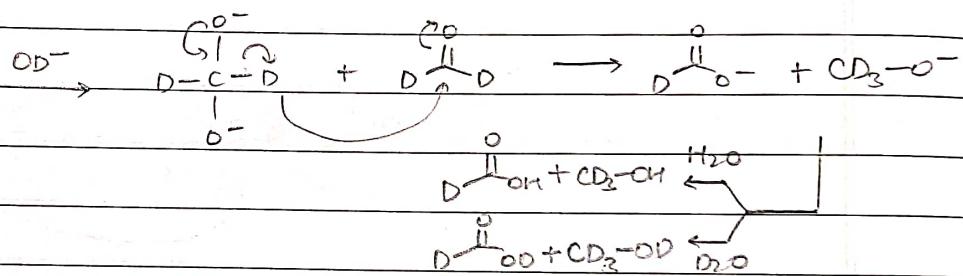
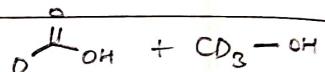
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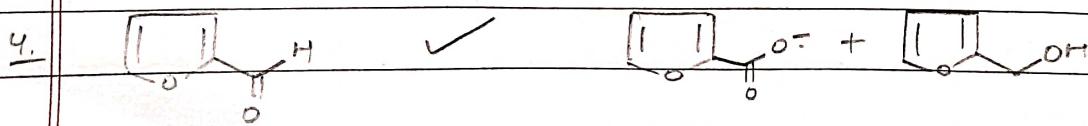
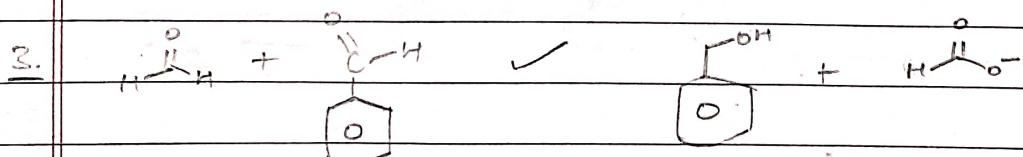
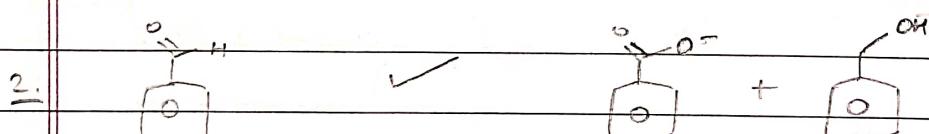
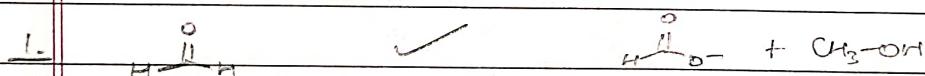


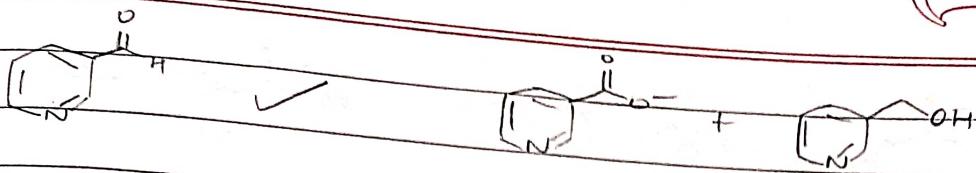
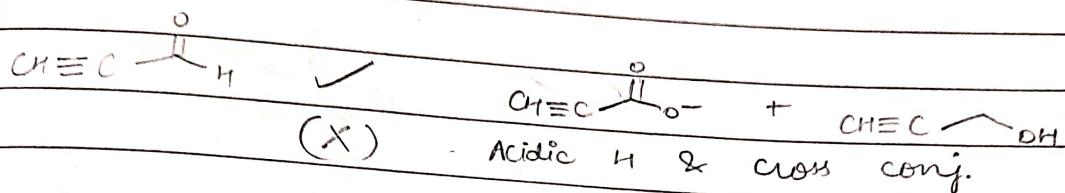
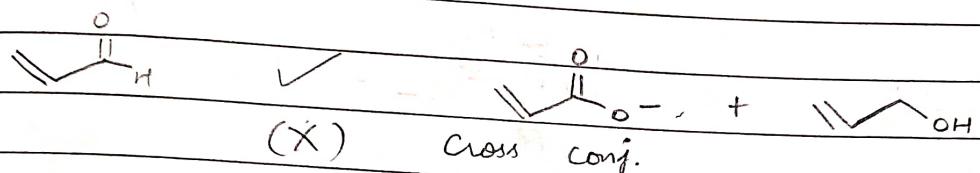
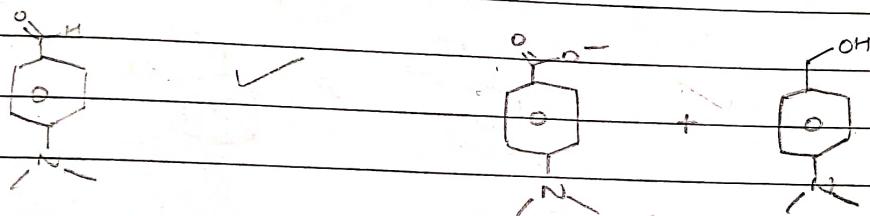


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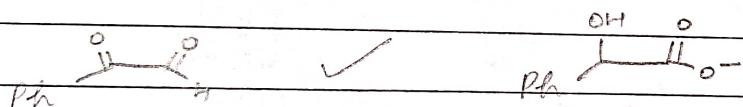
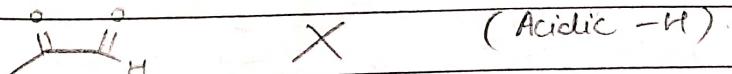
21/06/2023

Q. Which give Cannizaro reac?

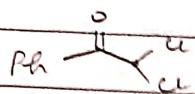


5.6.7.8.

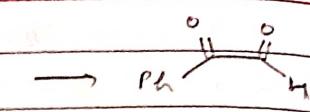
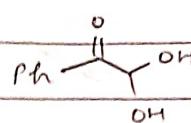
(X) Highly activating grp \Rightarrow ROR(Nu add)

9.10.11.12.

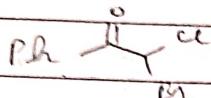
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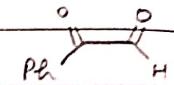
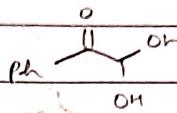
X (✓)



★ 14.

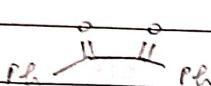


X (✓)

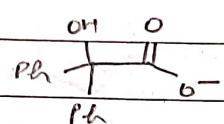


(R-I)

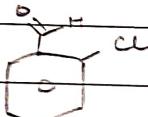
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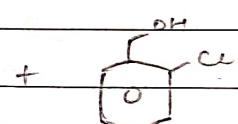
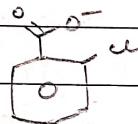
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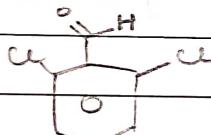


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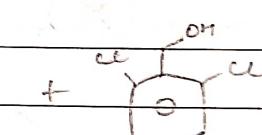
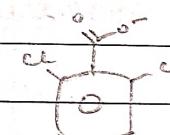


(R-II)

★ 17.



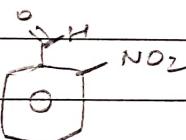
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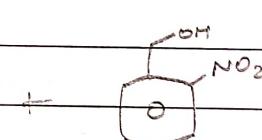
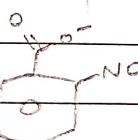
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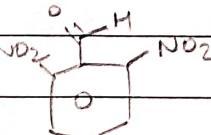


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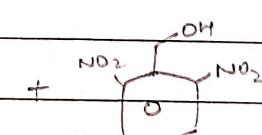
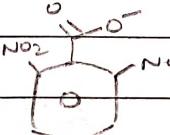


(R-II)

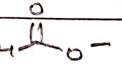
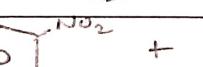
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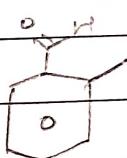
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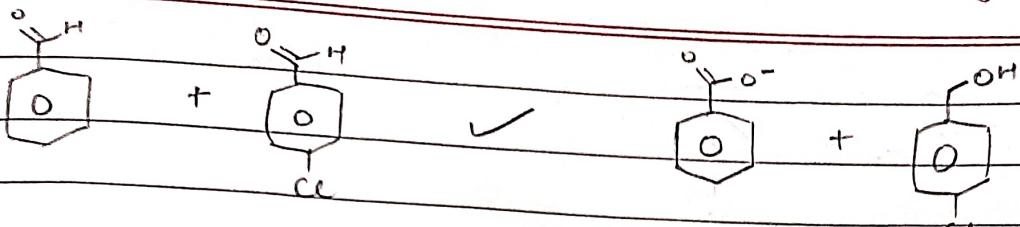
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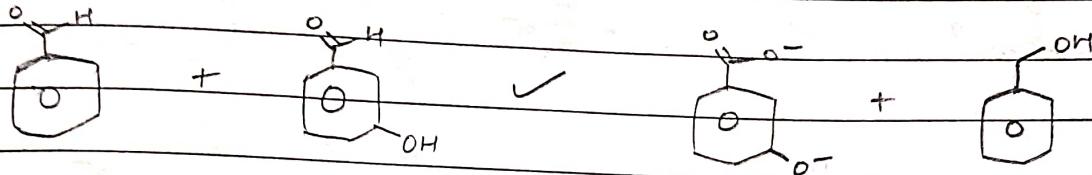
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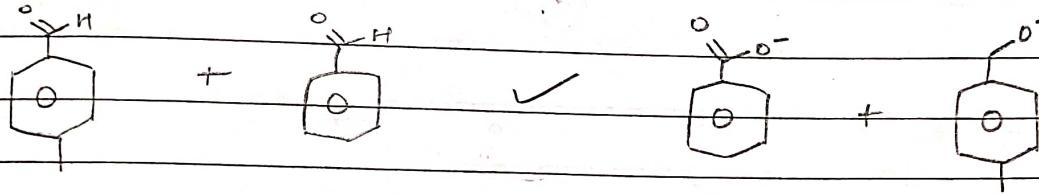
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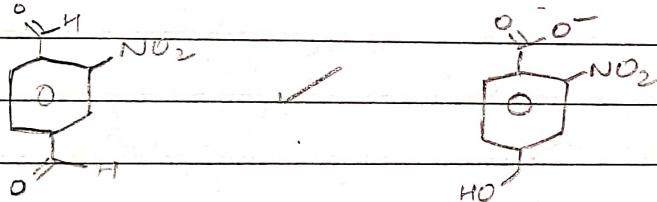
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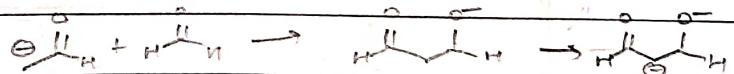
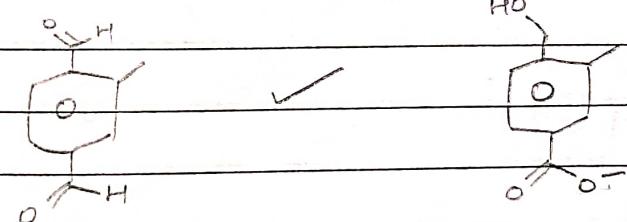
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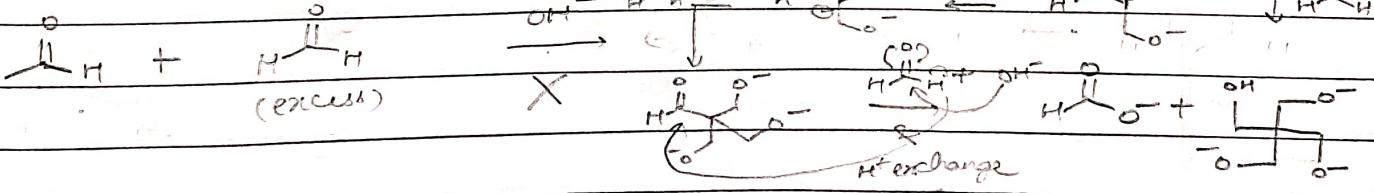
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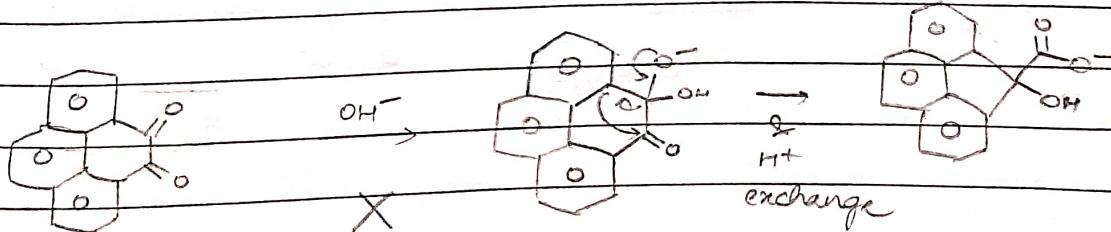
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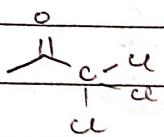


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27.

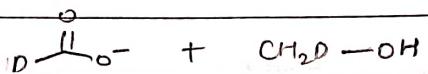
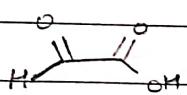


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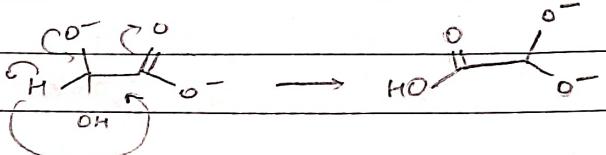
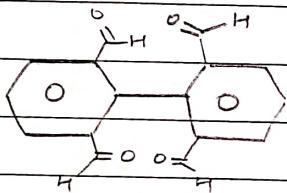
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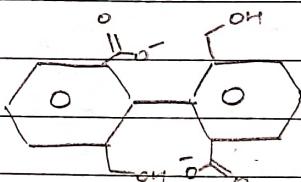
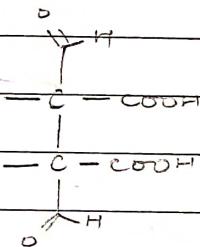
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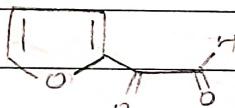
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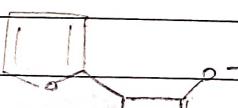
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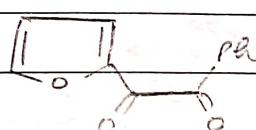
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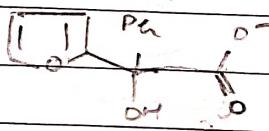
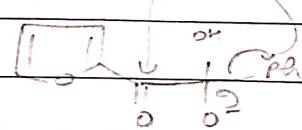
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(R-I)

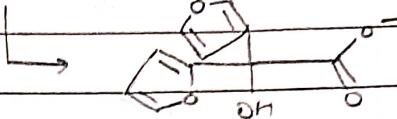
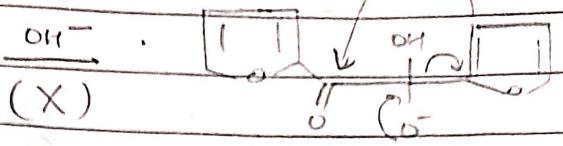
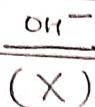
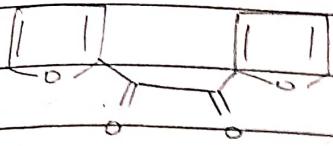
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(X)

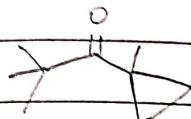


(R-I)

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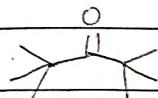


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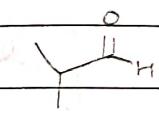
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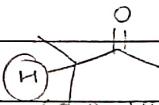
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38.



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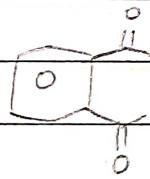
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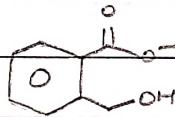
using less acidic

This comp. gives 95% Cannizzaro & 5% Aldol

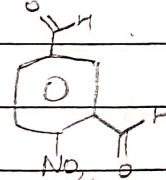
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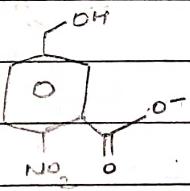
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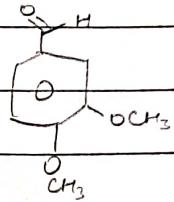
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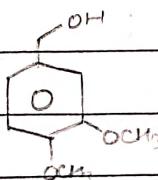
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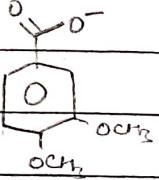
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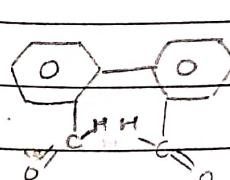
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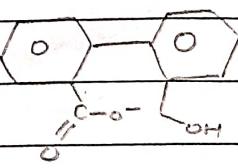
+



42.



✓



This is exception, and only happens in case of a single methyl epoxide with HBr or HI

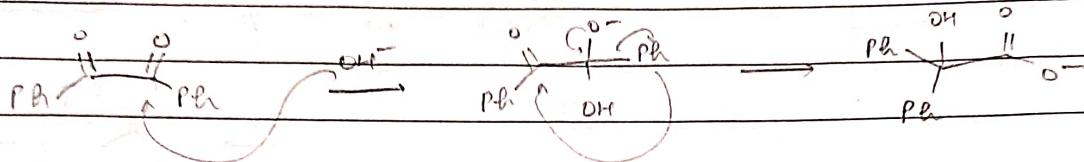
classmate

Date _____

Page _____

REMARK: I. Benzylic Rearrangement

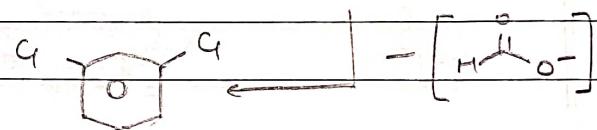
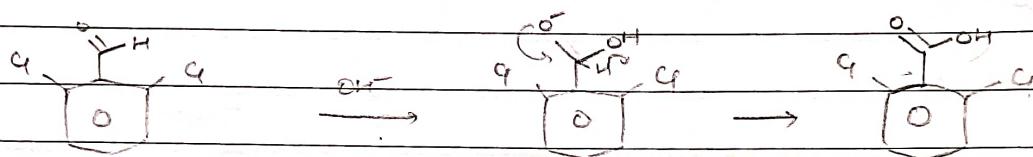
(Q 34, 35)



This takes place in case of any aromatic group (see 34 & 35)

II.

(Q 17, 19)

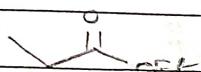
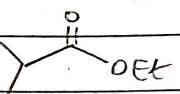
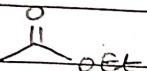


22/06/2013

CLAISEN ESTER CONDENSATION

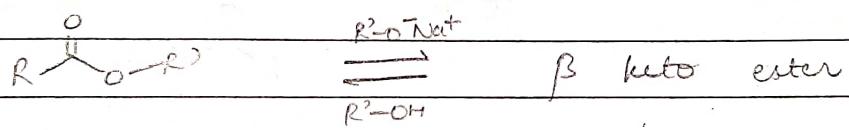
Cond'n: Ester + 2 α -acidic H

eg -

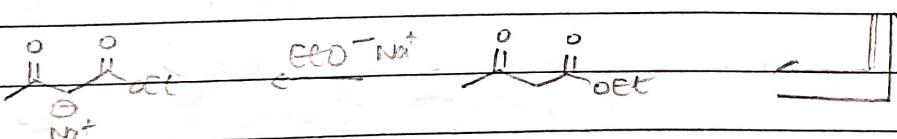
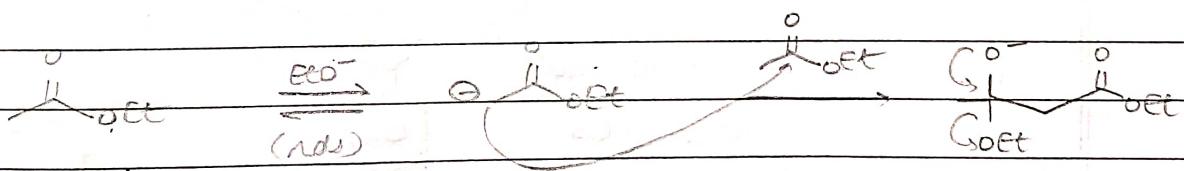


X

✓



Mechanism



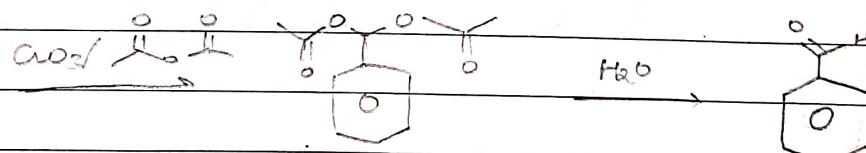
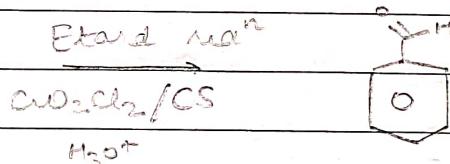
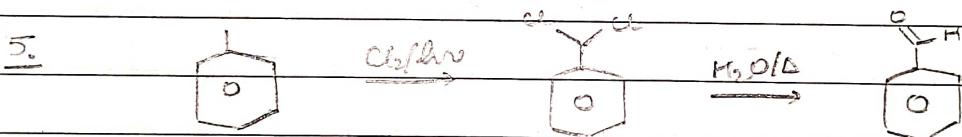
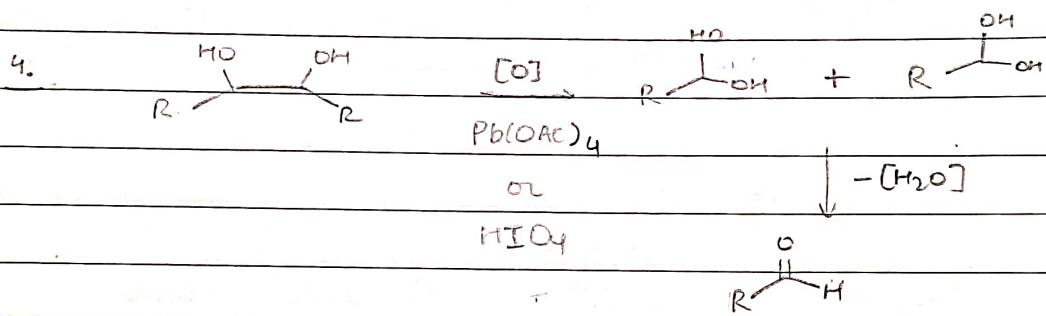
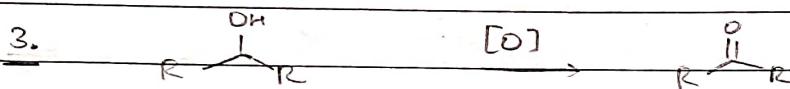
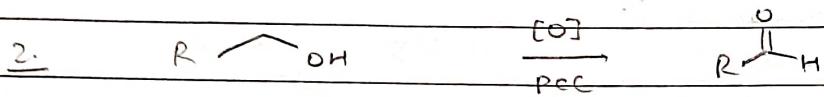
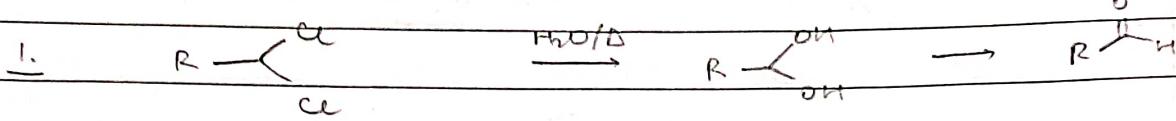
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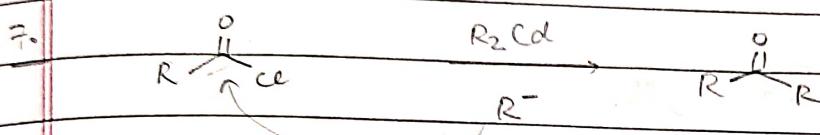
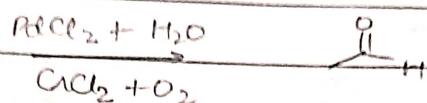
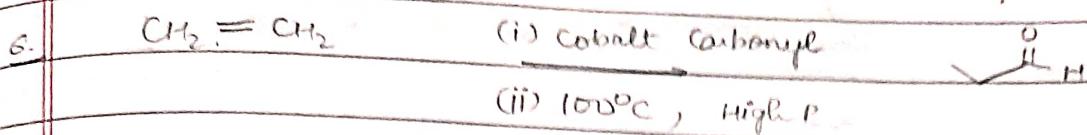
All steps are reversible.

So to drive the rxn fwd, salt is removed.
This is why 2 α -acidic H-atoms are required.

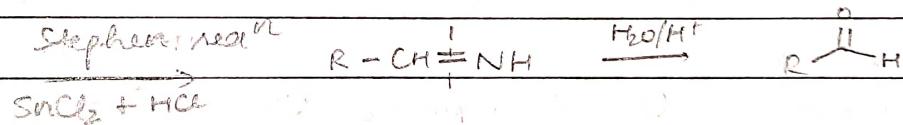
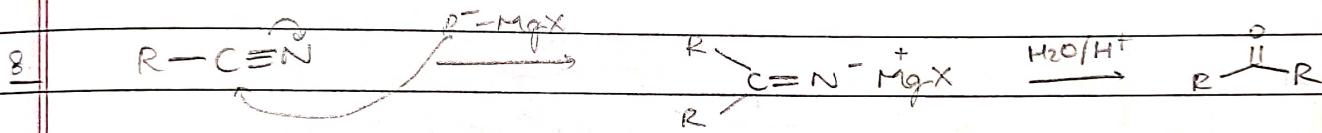
27/06/2023

PREP' OF ALDEHYDES & KETONES

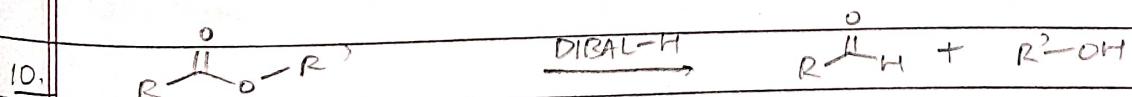
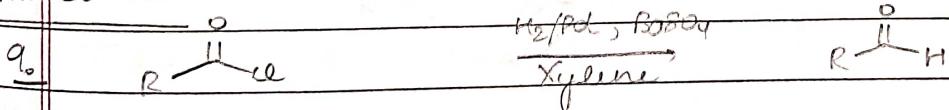


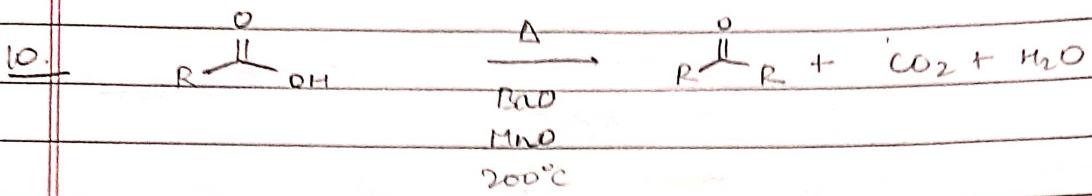
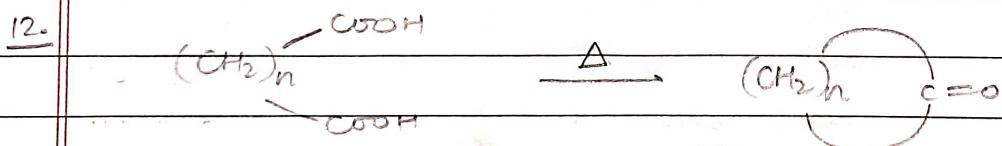
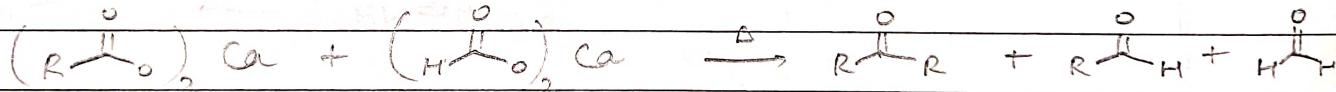
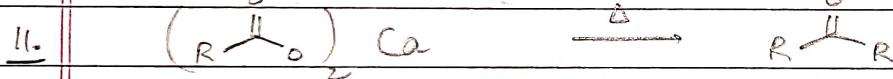
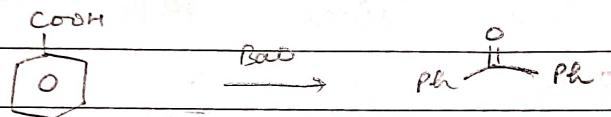
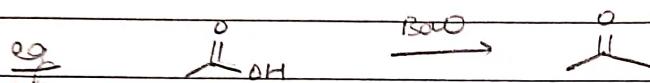
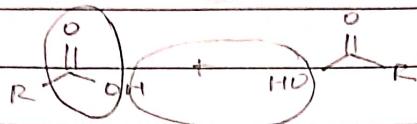


(Reaⁿ stops here since this R⁻ is soft now.)



Rosenmund reaⁿ

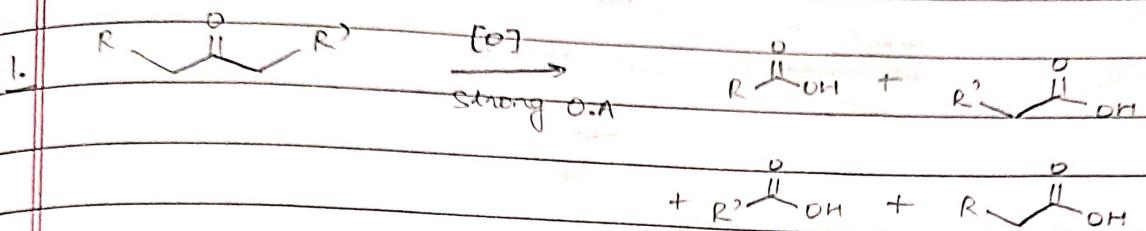


Trick:

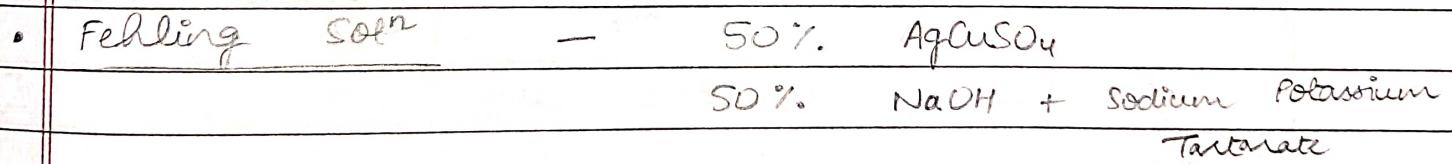
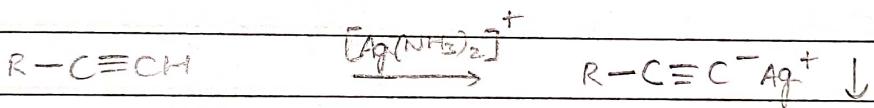
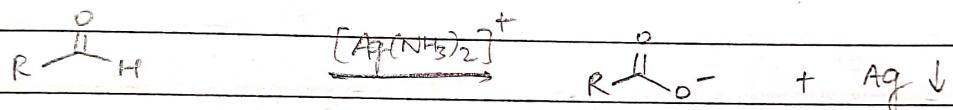
$$n = 4, 5$$

REACTIONS OF ALDEHYDES & KETONES

→ Redn'

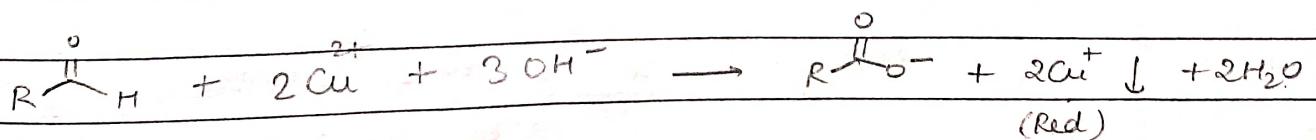


Selective O.A. : only Aldehyde to Acid

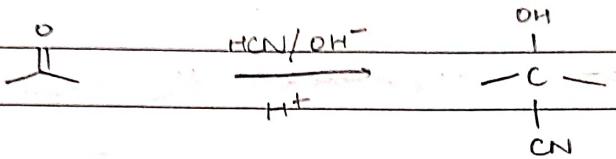


These give Cu^{2+} ions in soln. (Rochelle salt)

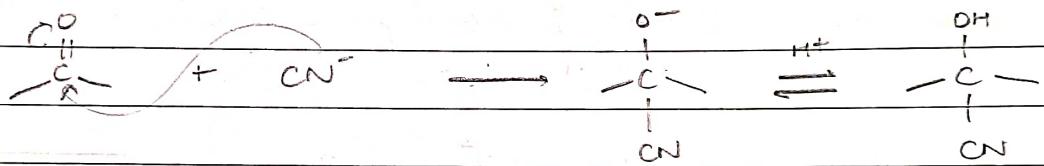
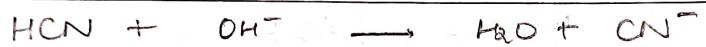
Selective O.A. : only Aliphatic Aldehyde to Acid.



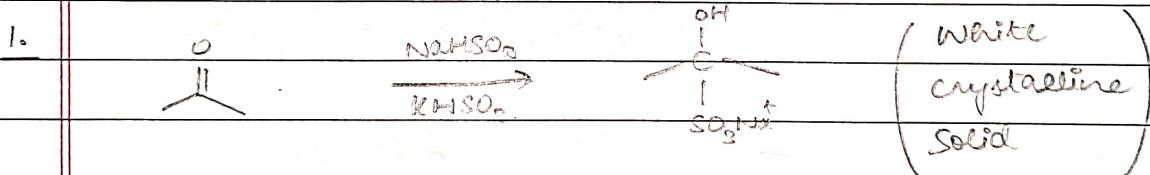
→ Cyanohydrin formation



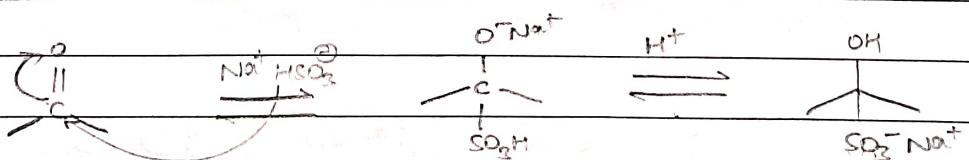
Mechanism



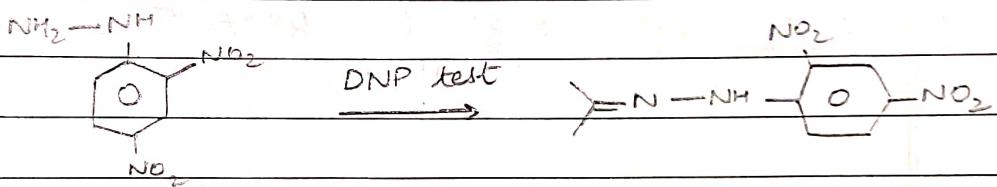
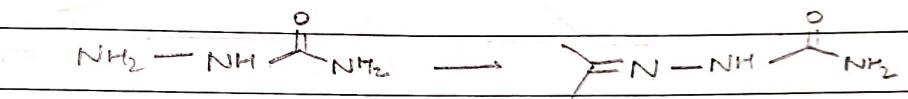
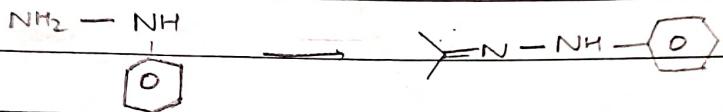
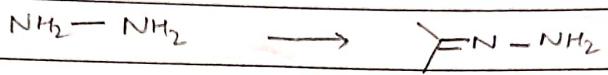
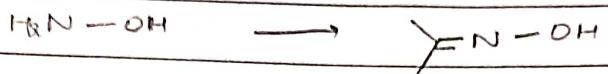
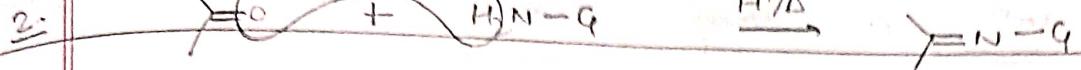
→ Addⁿ



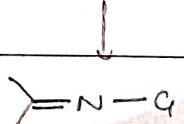
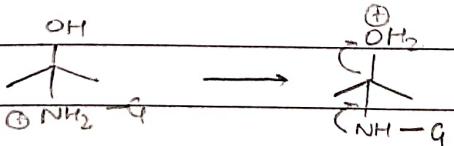
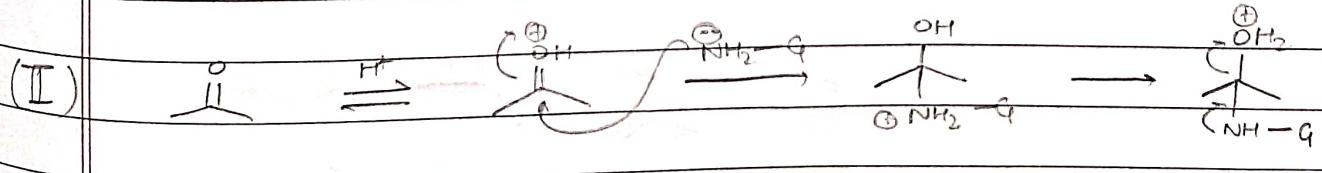
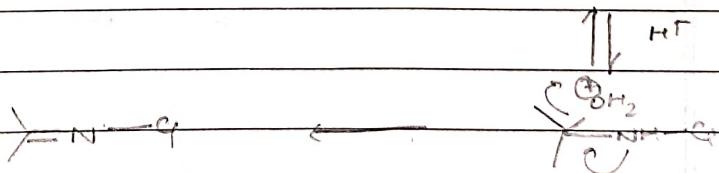
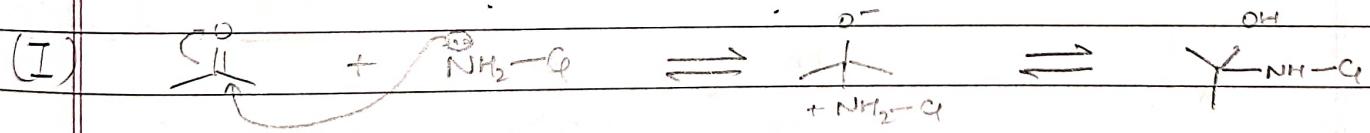
Mechanism



NOTE: All aldehydes & methyl ketones give this test (with $\# \text{C} \leq 6$)

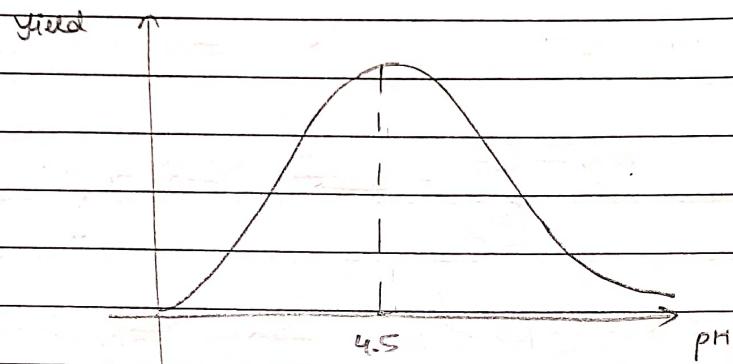
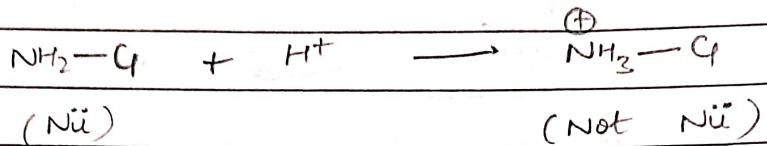


Mechanism



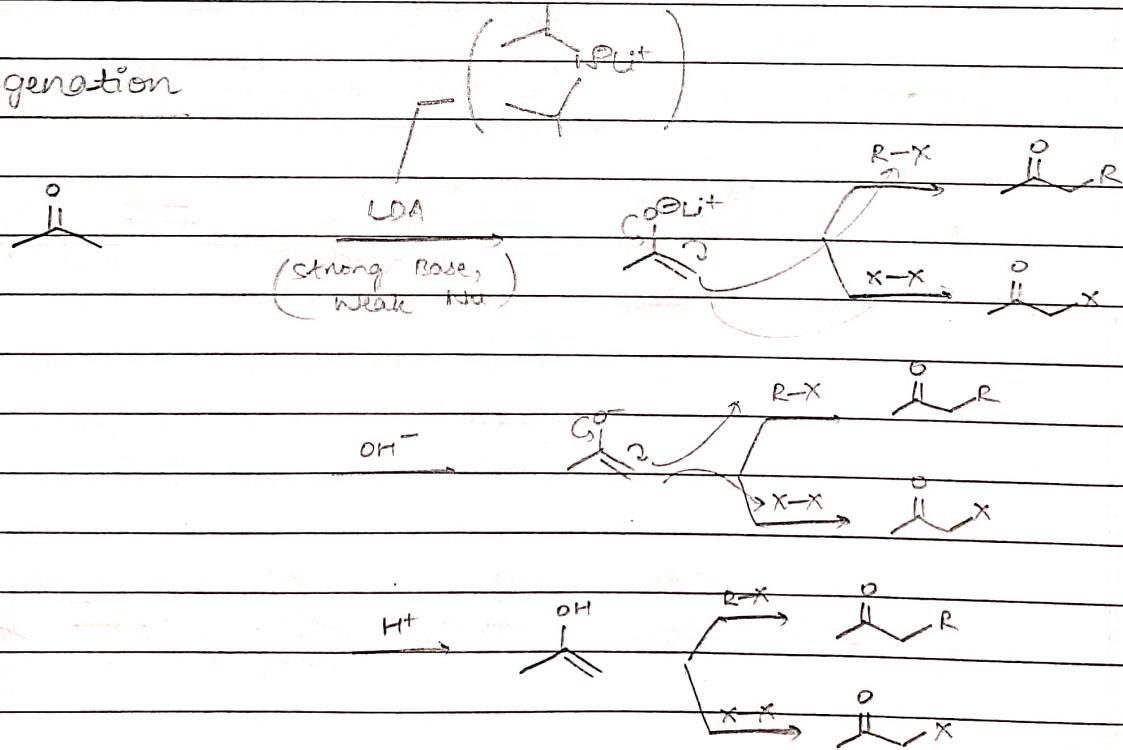
NOTE: This reagent is very sensitive to pH.

since

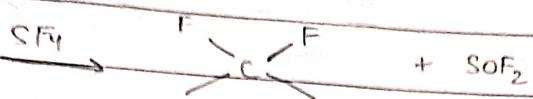
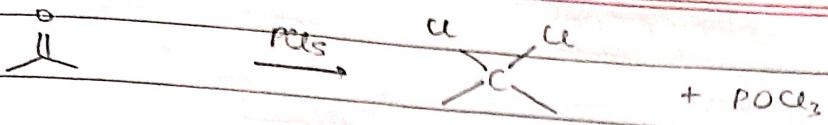


Best pH range : 4 to 5

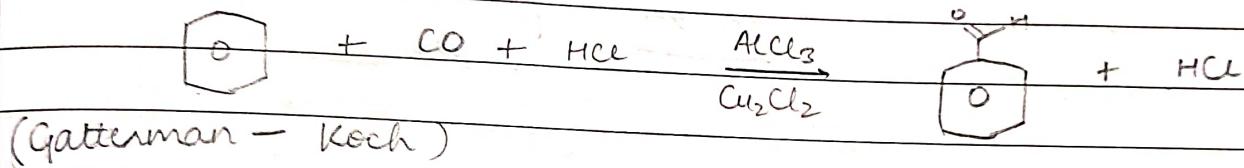
→ Halogenation



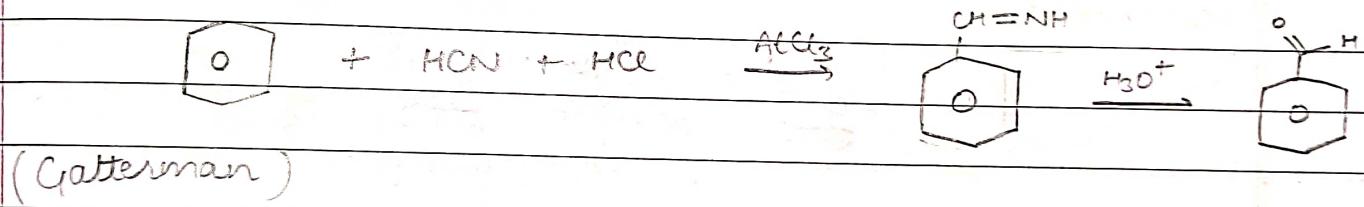
NOTE:



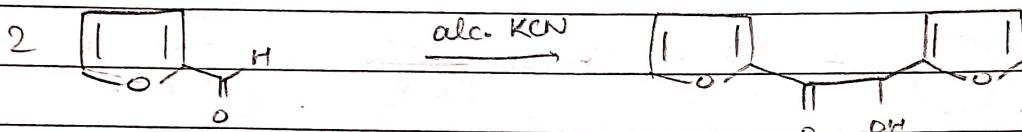
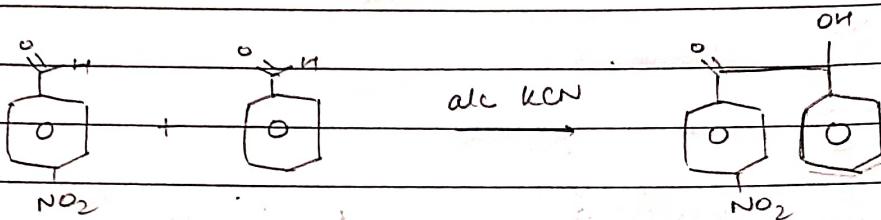
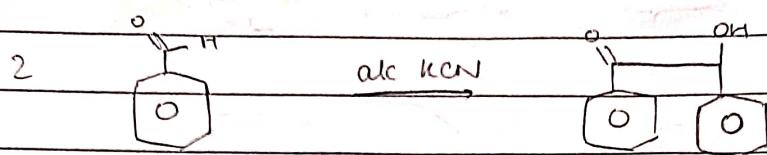
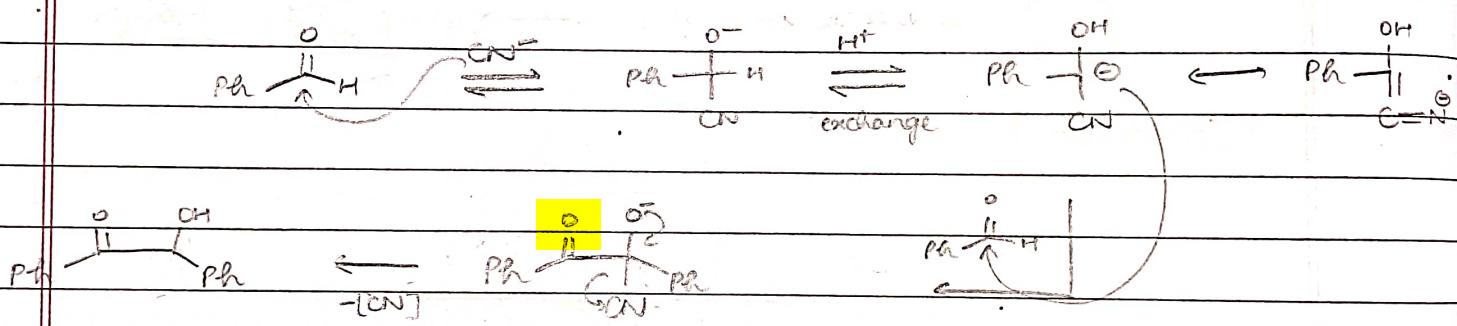
→ Aldhyde synthesis



(Gatterman - Koch)

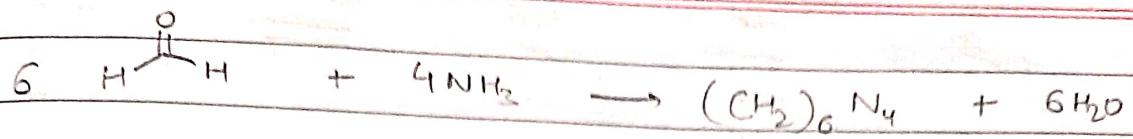


(Gatterman)

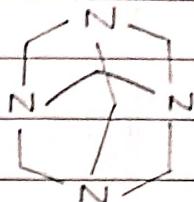
BENZONI CONDENSATIONMechanism

(Trick: Ketone on the ring whose rate of Nü addⁿ is greater)

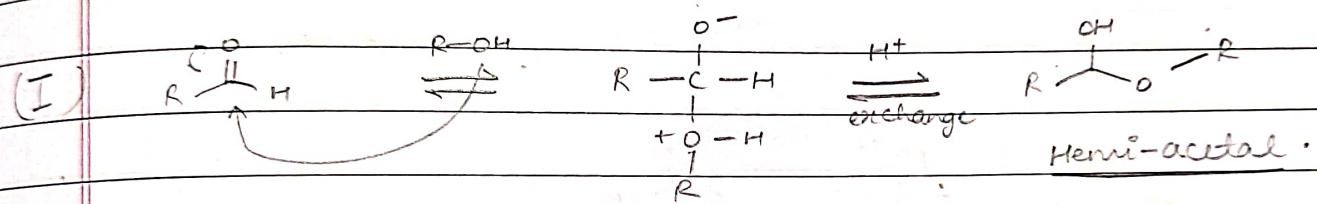
NOTE:



atropine

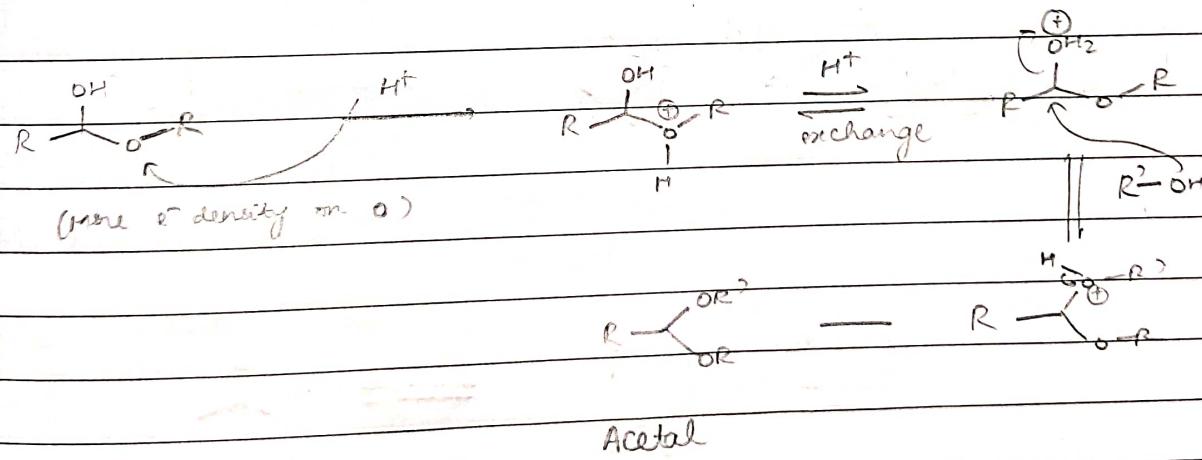


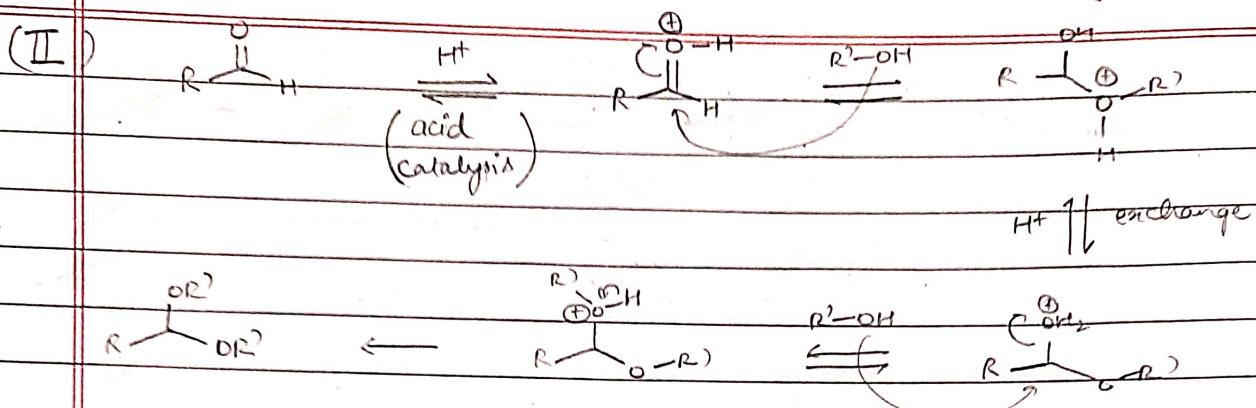
28/06/2023

PREPⁿ OF ACETAL & HEMIACETAL

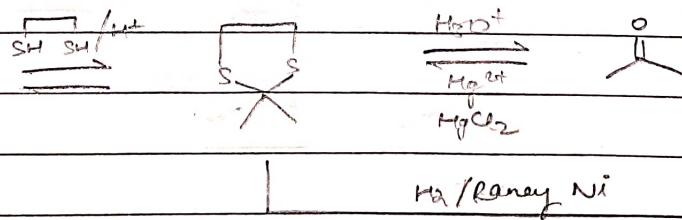
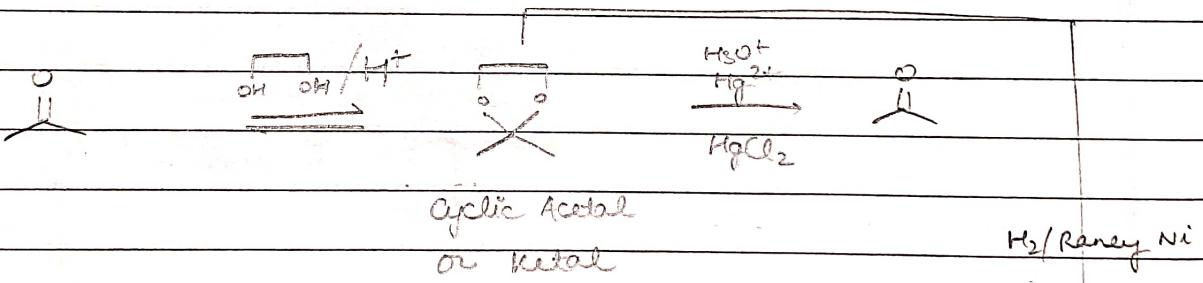
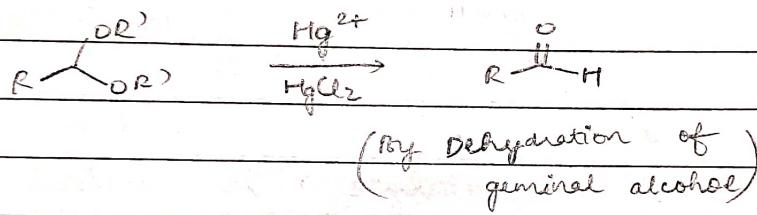
Rearn stops here.

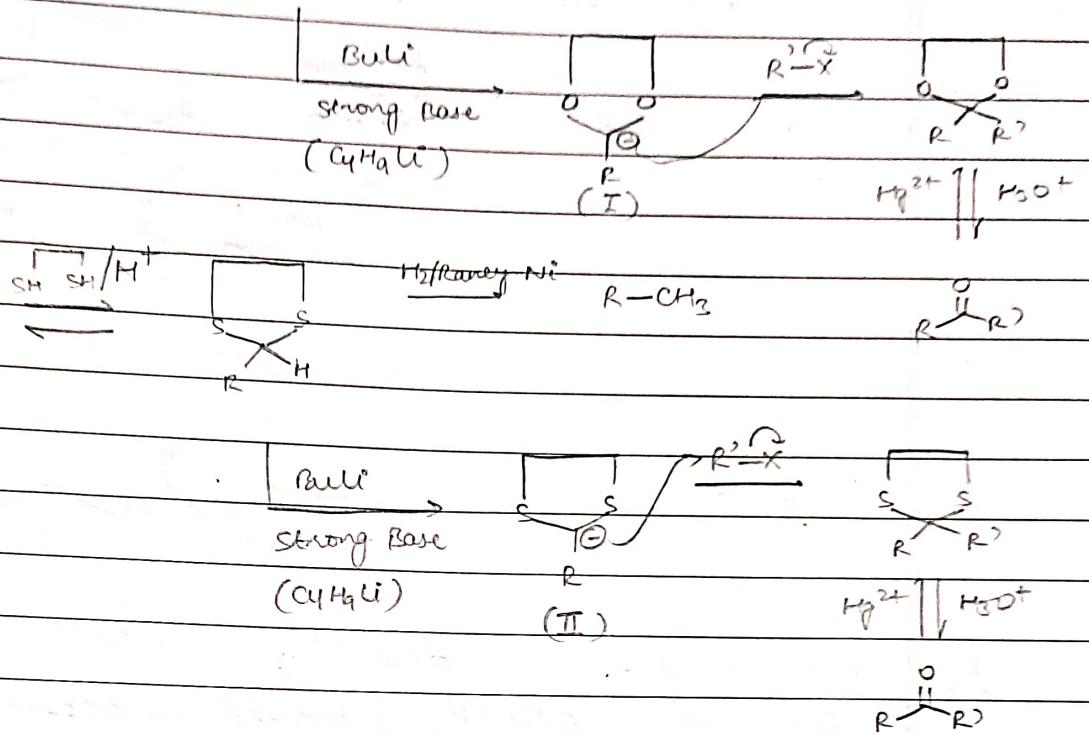
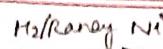
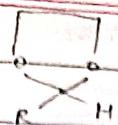
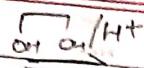
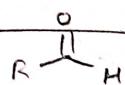
If we further catalyse it with acid
(e.g. dry. HCl).





NOTE: Unlike in (I), reaction does not stop at. Hemi-acetal



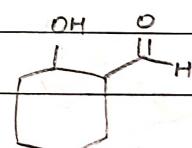
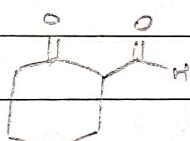


Stability : $(\text{II}) > (\text{I})$ (Vacant orbital in S).

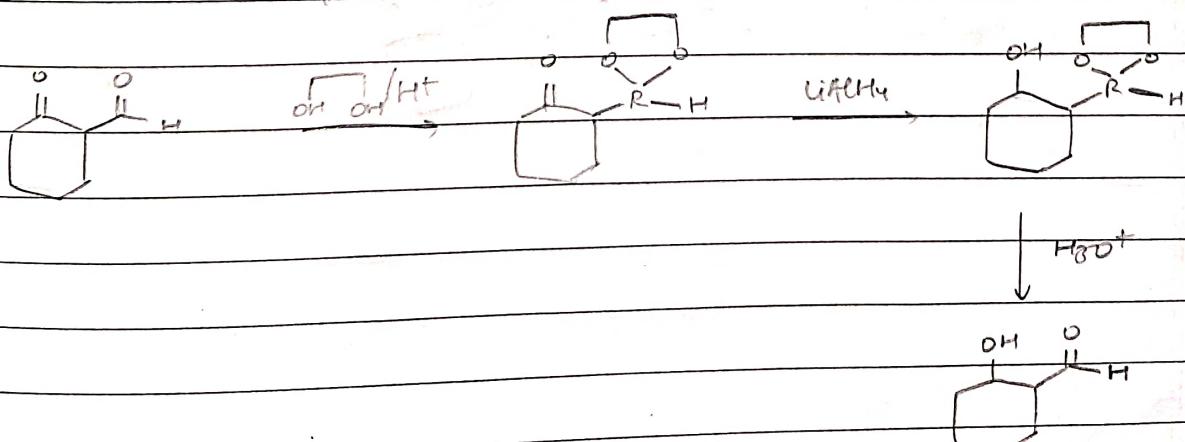
Nucleophilicity : $(\text{I}) > (\text{II})$ (Θ^- involved in resonance with S)

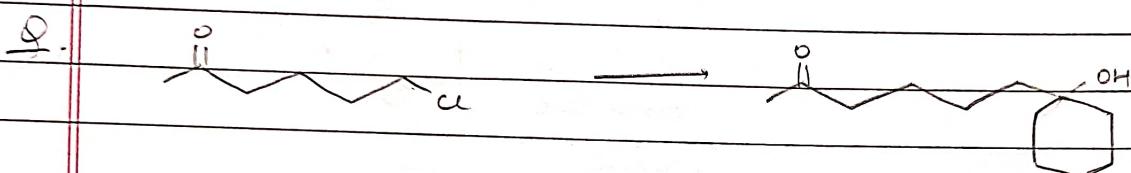
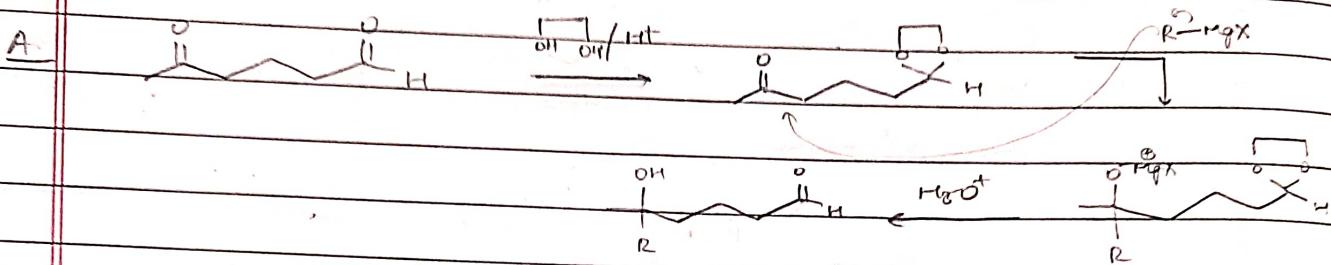
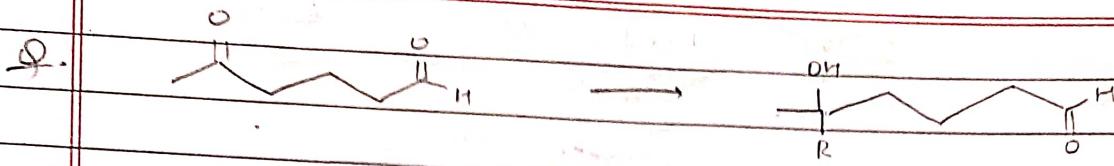
Q.

Convert

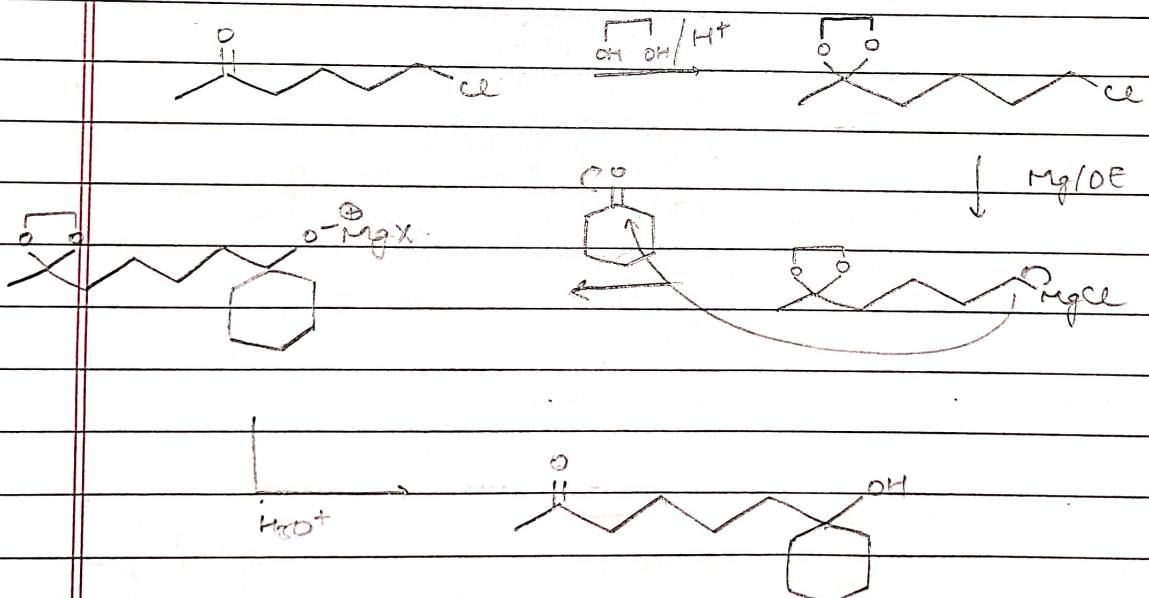


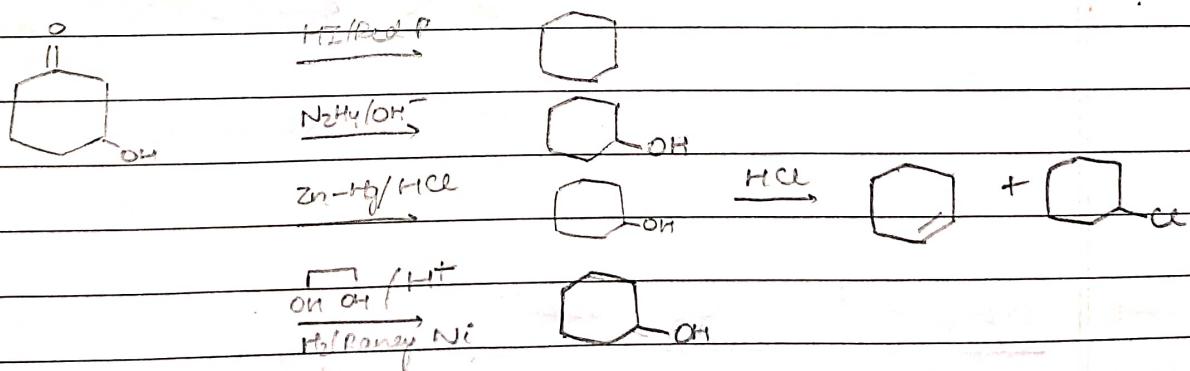
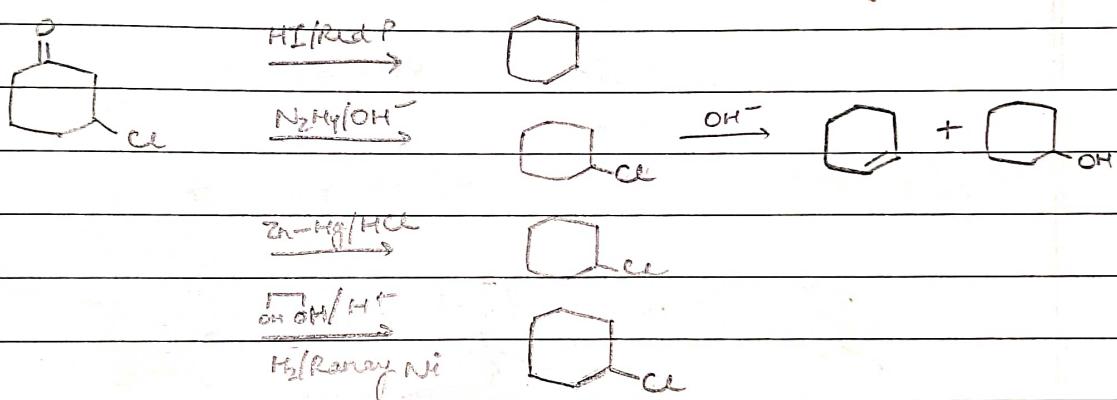
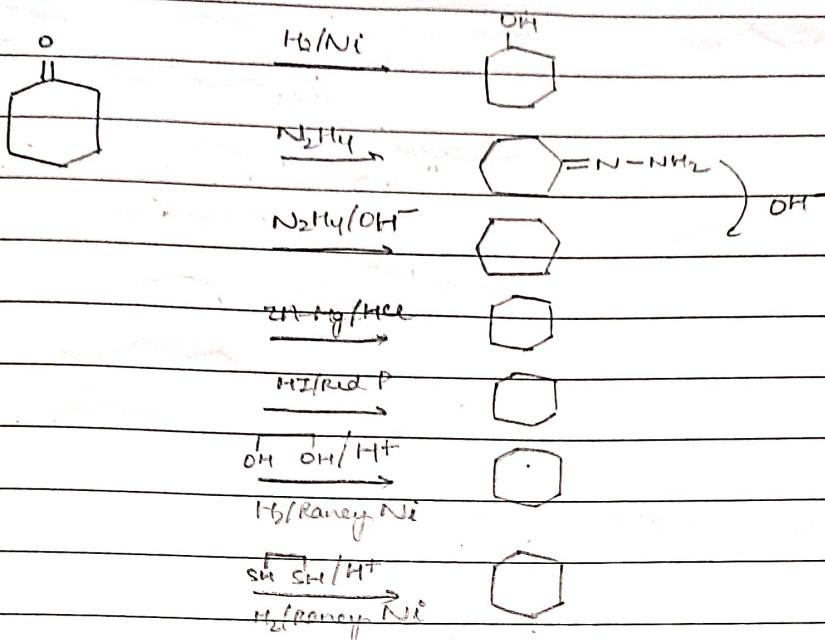
A. We need to protect aldehyde using ketal before adding R-A

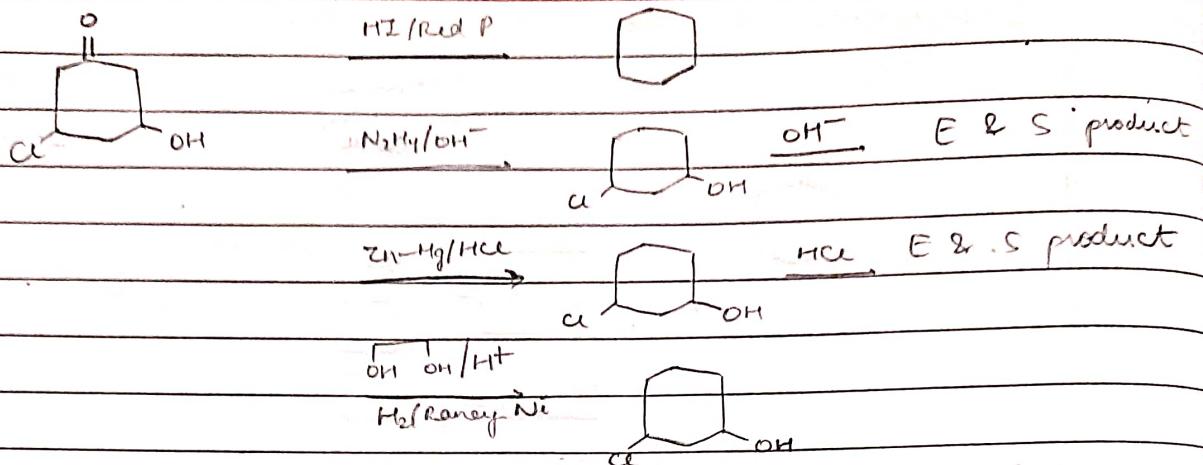




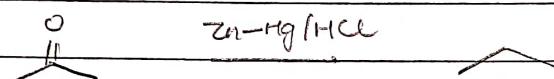
A We cannot directly add Mg/DE as internal attack would occur.
Hence we protect the ketone first.



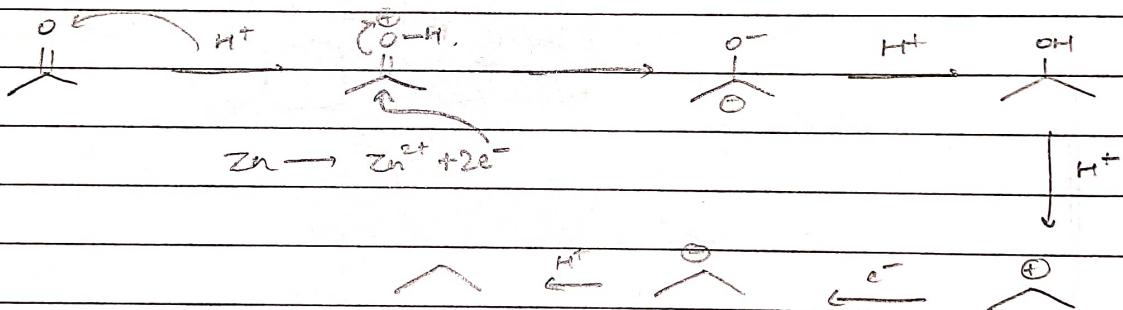
CLEMENSON & WOLF-KISHNER REDⁿ



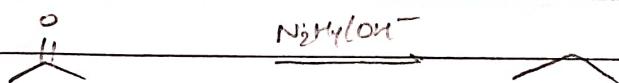
→ Clemmson redⁿ

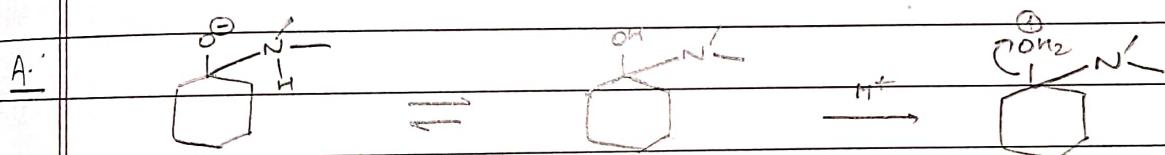
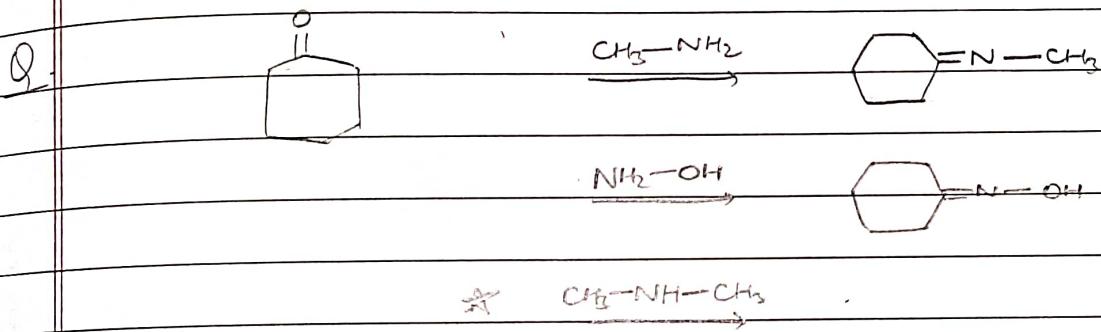
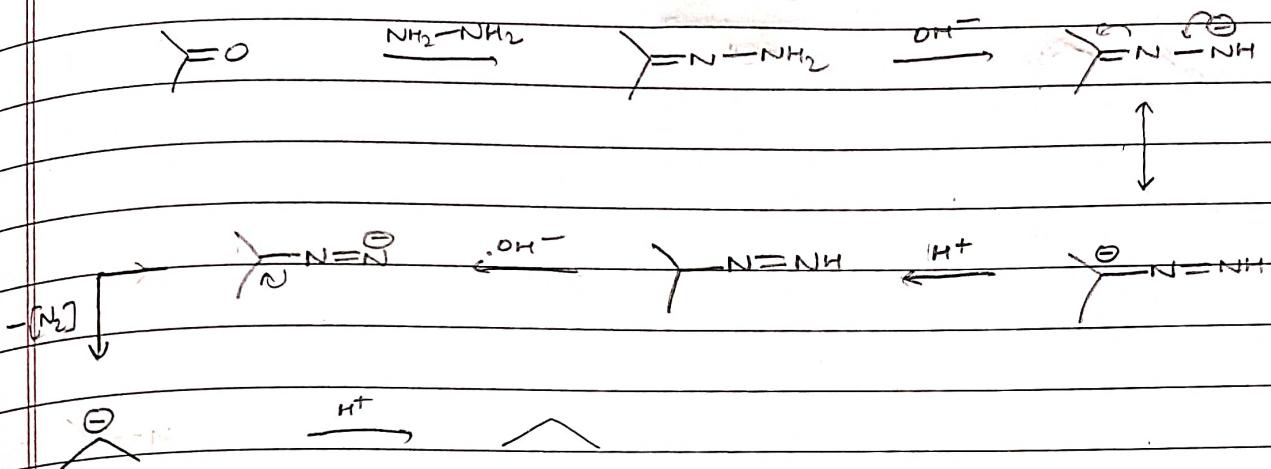


Mechanism



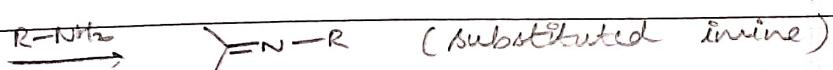
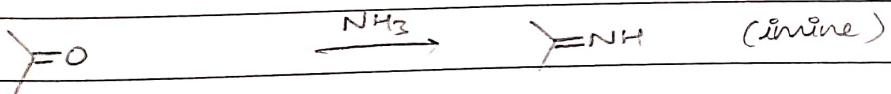
→ Wolf-Kishner redⁿ



Mechanism

Now, dp of N cannot attack on C^+ created as there is not $- \text{H}$ which can leave.

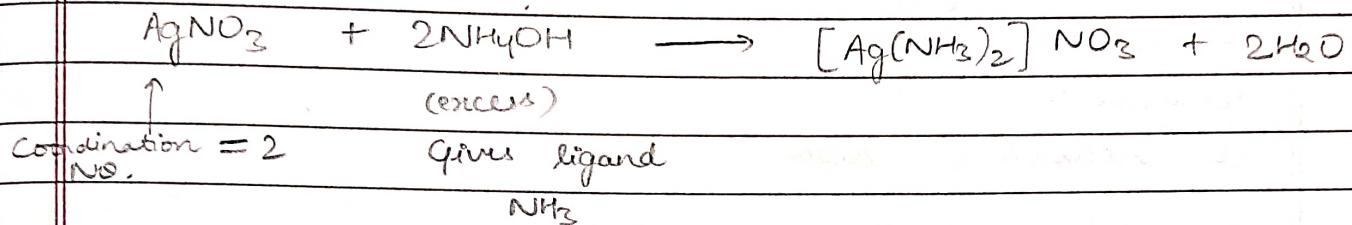
Therefore elimination occurs. i.e.

NOTE:

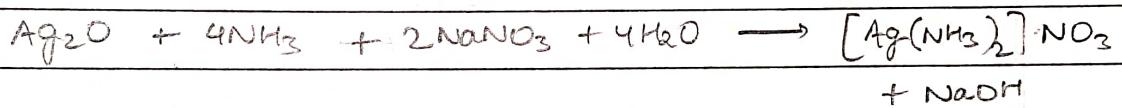
04/07/2023

TOLLEN'S REAGENT (Ammonical Silver Nitrate)

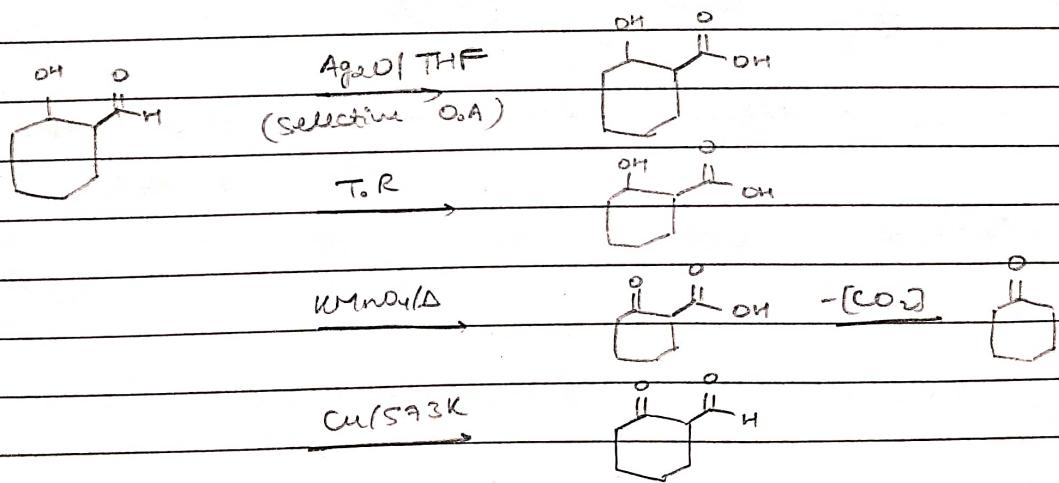
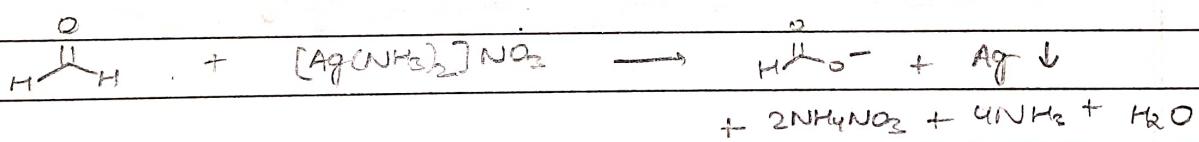
Type I : $\text{NH}_4\text{OH} + \text{AgNO}_3$



Type II : $2\text{AgNO}_3 + 2\text{NaOH} \longrightarrow \text{Ag}_2\text{O} (\text{s}) + 2\text{NaNO}_3 + \text{H}_2\text{O}$



T.O.R is selective O.o.A



Compounds which give +ve Tollen's test

All aldehydes

All terminal alkynes

Formic acid

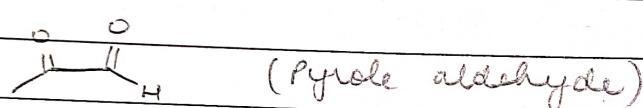
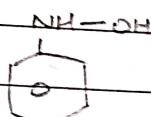
Glyceral ($\text{H}_2\text{C}=\text{CH}_2\text{OH}$)

Glyonal acid ($\text{H}_2\text{C}=\text{CHCOOH}$)

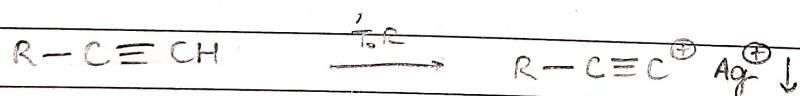
α -Hydroxy ketones

Hemiacetal

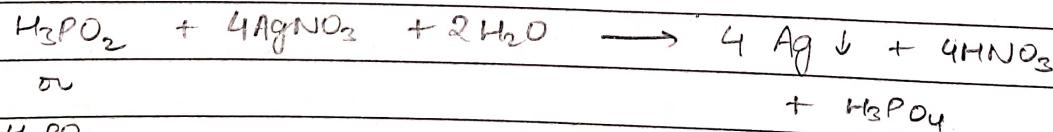
All reducing sugar



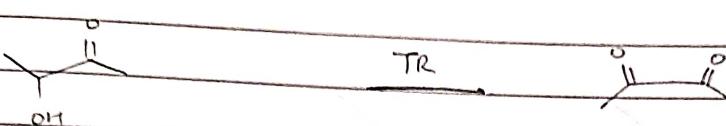
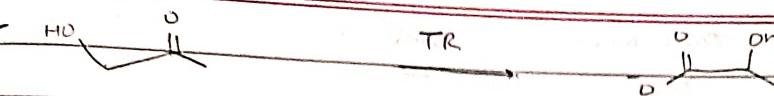
NOTE: ① Terminal alkynes give Tollen's test
but not silver mirror test.



② H_3PO_2 & H_3PO_3 give Silver Mirror test
but not Tollen's test.

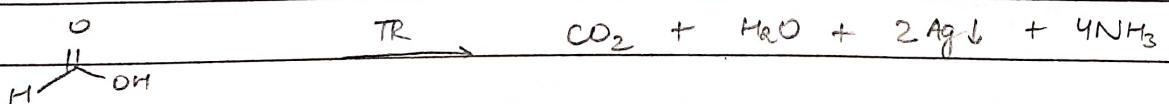
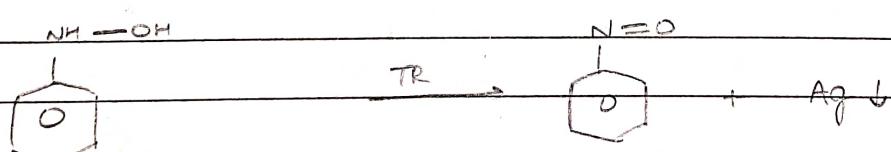
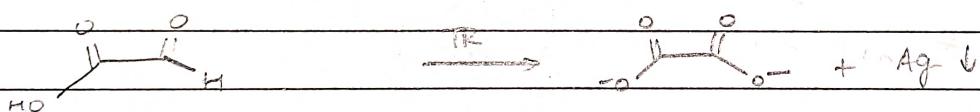
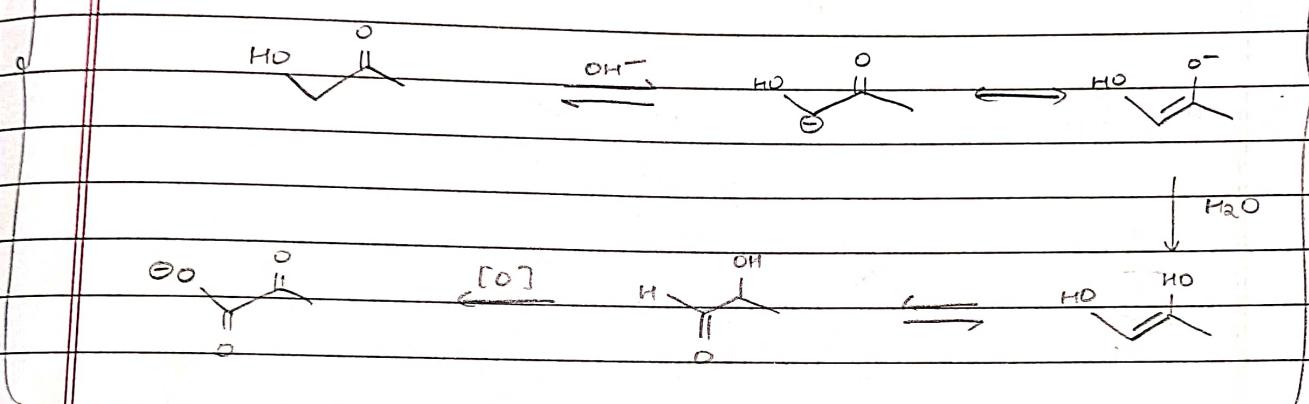


(3)



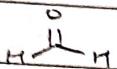
★

Mechanism



Q

Compound

Tollen's
TestSilver
mirror
testFehling's
Test1.

✓

✓

✓

2.

✓

✓

✓

3.

✓

✓

✓

4.

X

X

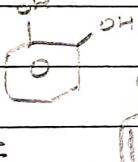
X

5.

X

X

X

6.

X

X

✓

()

(✓)

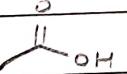
(✓)

7.

✓

✓

✓

8.

X

X

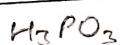
X

9.

X

X

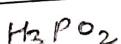
X

10.

X

✓

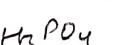
X

11.

X

✓

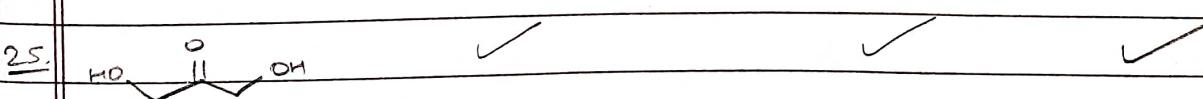
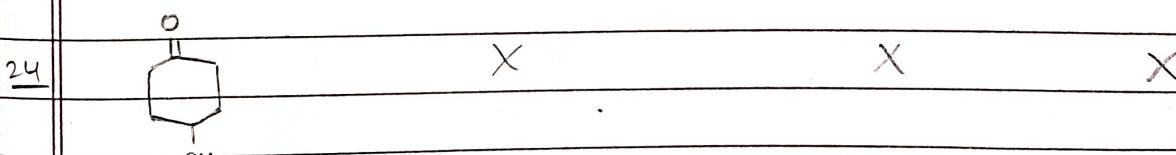
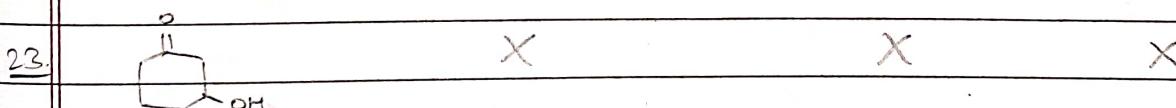
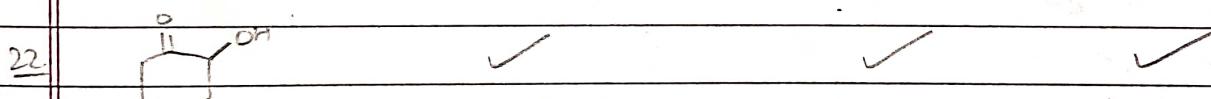
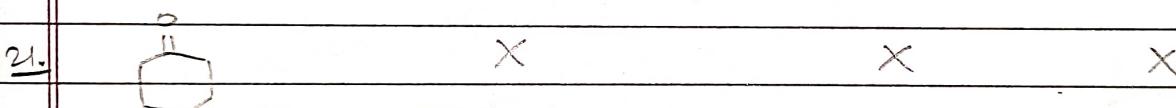
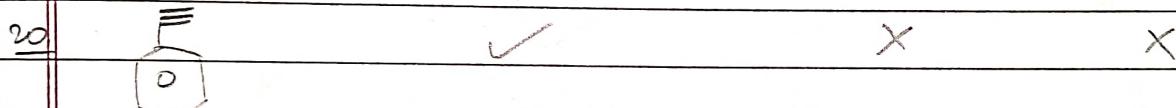
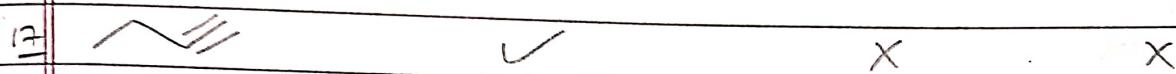
X

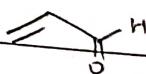
12.

X

X

X



26.

✓

✓

✓

27.

✓

✓

✓

28.

Glucose

✓

✓

✓

29.

Fructose

✓

✓

✓

30.

Sucrose

X

X

X

31.

Maltose

✓

✓

✓

32.

Lactose

✓

✓

✓

33.

Starch

X

X

X

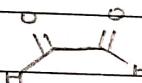
34.

Cellulose

X

X

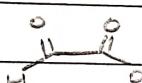
X

* 35.

✓

✓

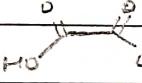
X

* 36.

✓

✓

X

37.

X

X

X

(R-I)

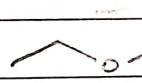
* 38.

X

X

✓

(R-I)

* 39.

✓

✓

X

(R-I)

* 40.

✓

✓

✓

(R-I)

* 41.

✓

✓

X

42.

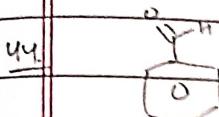
X

X

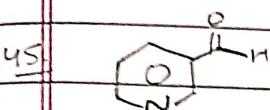
X



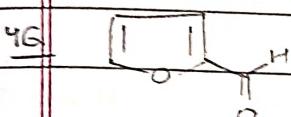
✓ ✓ ✓



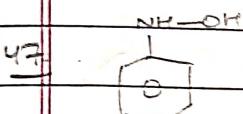
✓ ✓ . X



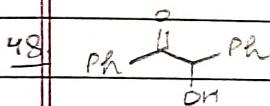
✓ ✓ X



✓ ✓ X



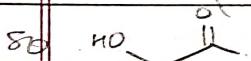
✓ ✓ X



✓ ✓ ✓

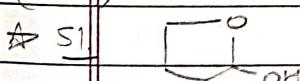


✓ ✓ ✓



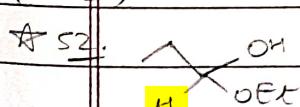
✓ ✓ ✓

(R-I)



✓ ✓ ✓

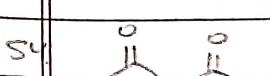
(R-II)



✓ ✓ X



X X X



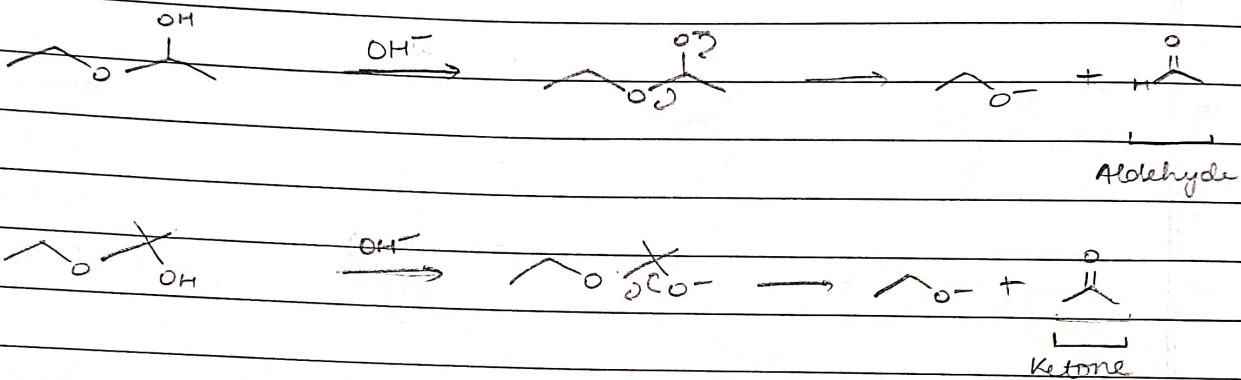
✓ ✓ ✓

NOTE:

① All mono & disaccharides except sucrose give Tollen's, Silver Mirror Test & Fehling's test

REMARK:

Q 38-41 & 51

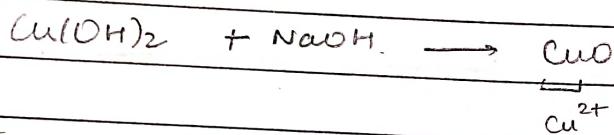


FEHLING'S TEST

Fehling soln → Blue colour, not ppt

→ Fehling (A) - Aq. CuSO_4
(50%)

→ Fehling (B) - $\text{NaOH}/\text{NH}_4\text{OH}$ + Sodium & Potassium
Tartarate
(Rochelle's salt)



Cu^{2+} precipitates (blue), to avoid which, Rochelle's salt is added, which forms complex with it.

In test $\text{Cu}^{\text{II}} \rightarrow \text{Cu}^{\text{I}}$ (Red)

Compounds which give Fehling's test

All aldehydes except aromatic aldehydes

Formic Acid

α -Hydroxyketones

Hemiacetal

All mono & disaccharides (except sucrose)

BENEDICT'S TEST

Same as Fehling's Test

Benedict (A) - aq. CuSO_4

Benedict (B) - NaOH + Sodium Potassium Citrate

SCHIFF'S TEST

Dil. soln of rosaniline hydrochloride in water has red or magenta colour.

When SO_2 gas passed through soln, magenta colour disappears

When aldehyde added to this soln, magenta colour reappears

All aldehydes except those having intramolecular H-bonding give Schiff's test.

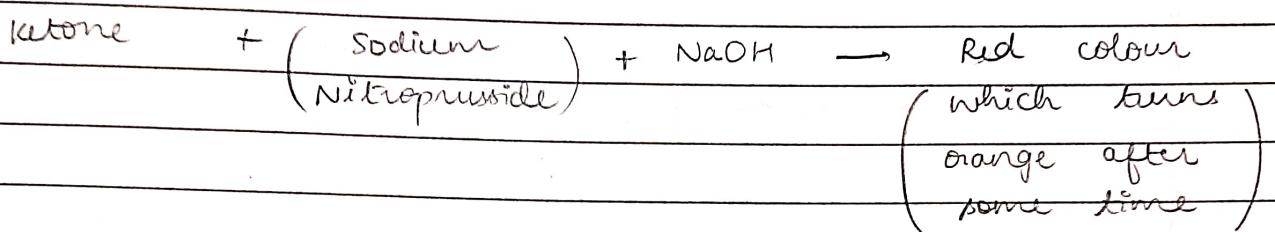
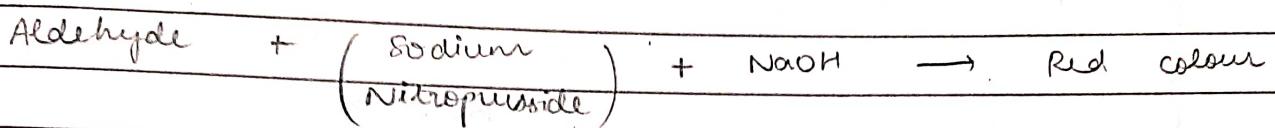
Formic acid ✓

Vanillin X

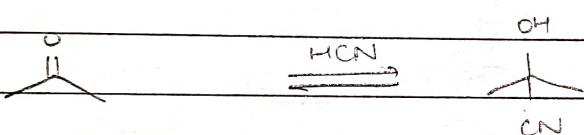
Glucose X

Fructose X

SODIUM NITROPRUSSIDE TEST

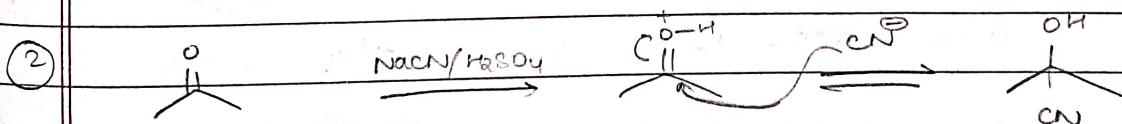
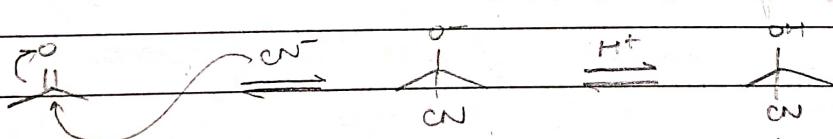
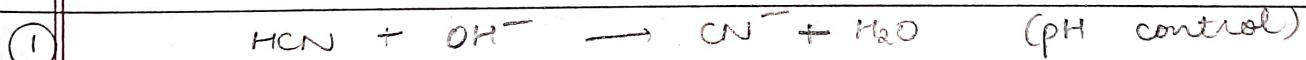


CYANOHYDRIN

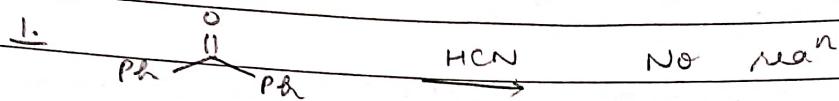


But this method gives poor yield as HCN is weak acid.

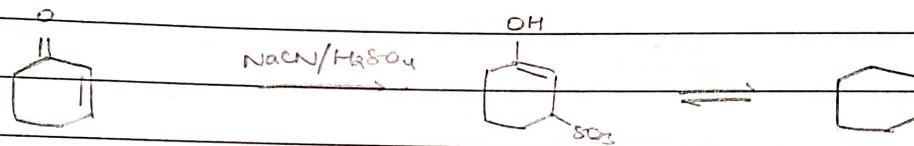
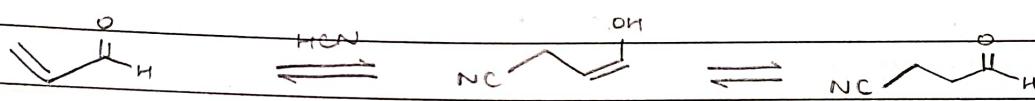
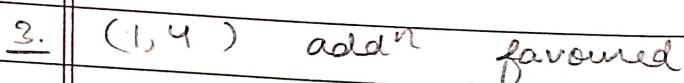
To get good yield, there are 2 ways.



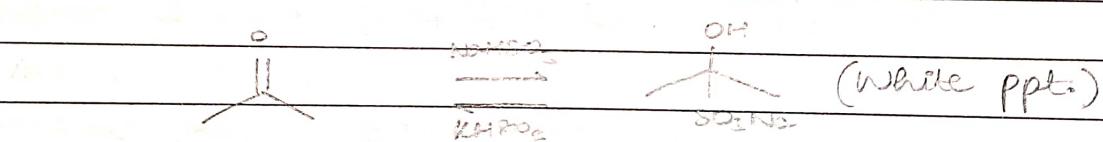
NOTE:



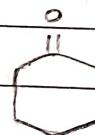
due to steric
hindrance



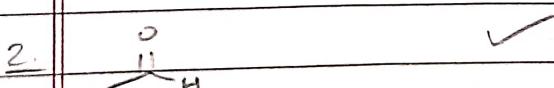
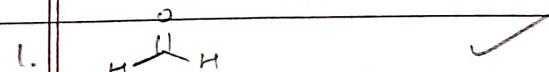
SODIUM METABISULPHITE TEST



Comp. giving SMS test

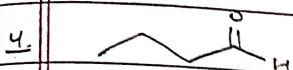
All aldehydes except glucose & fructose
Methyl ketones with #C ≤ 6 & 

Q. Which give SMS Test





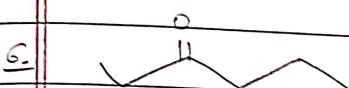
✓



✓



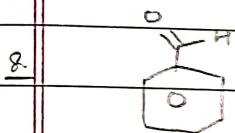
✓



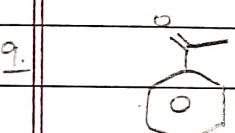
X



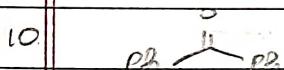
✓



✓



✓



X



X



X



X

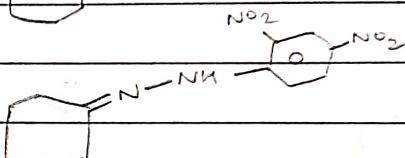
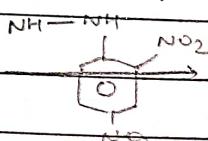
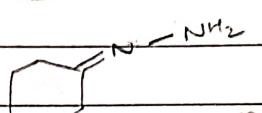
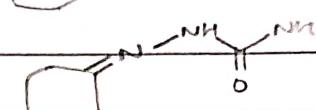
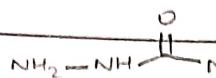
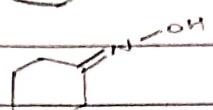
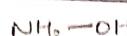
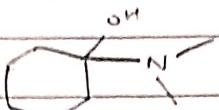
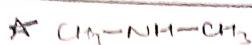
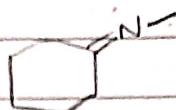


X



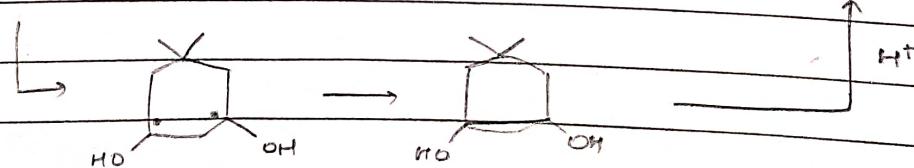
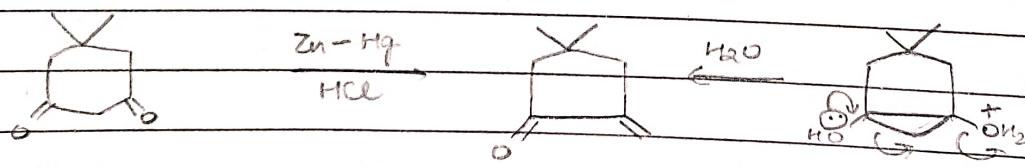
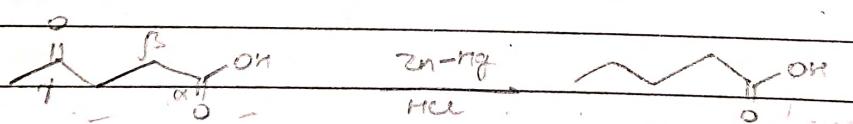
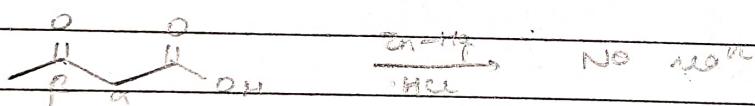
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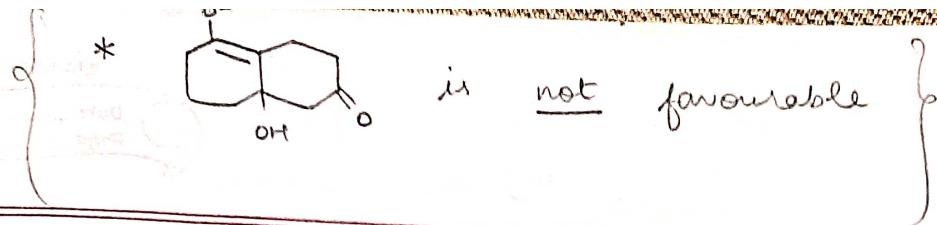
Q



(Brady's Reagent)

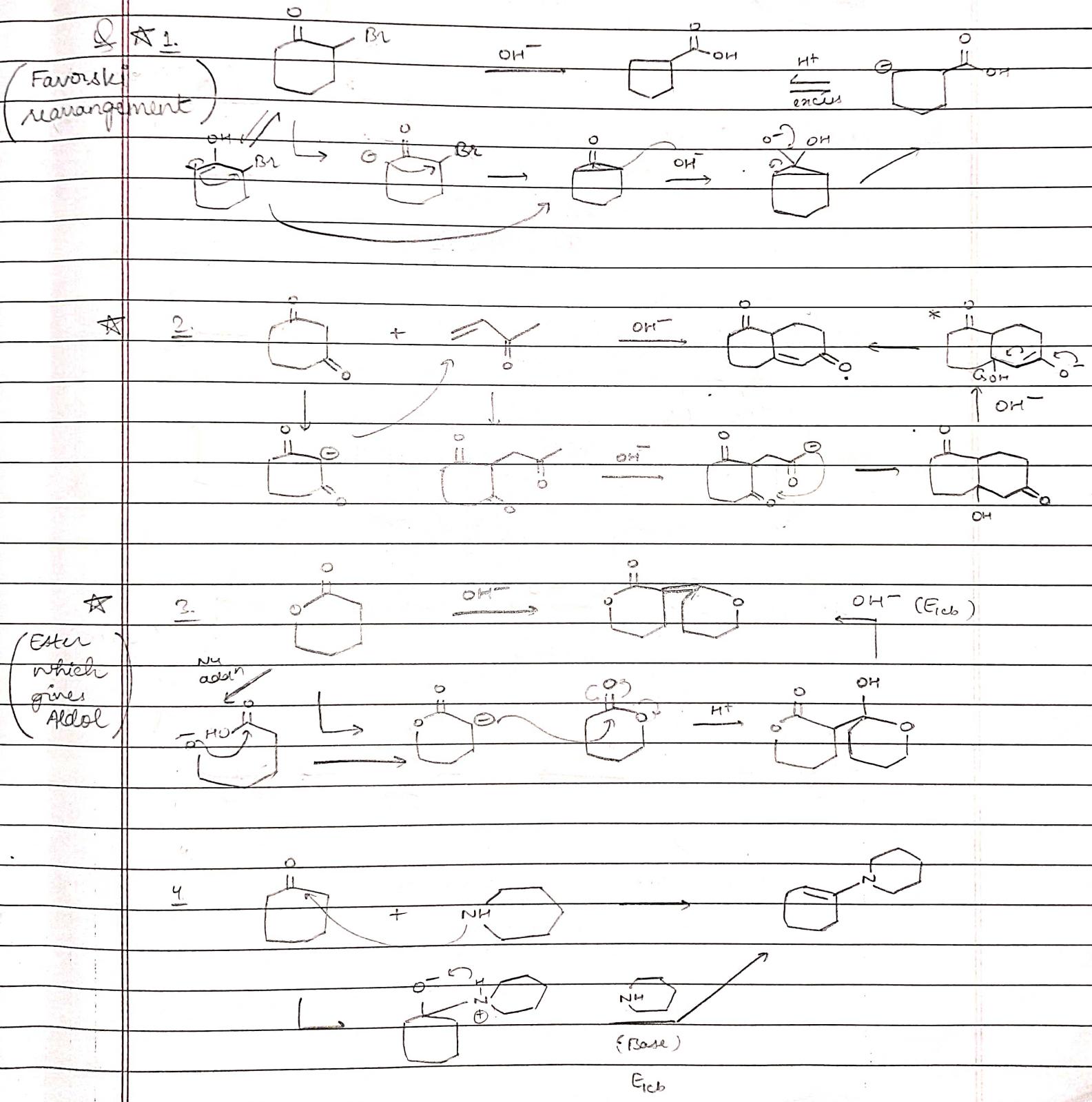
MISCELLANEOUS REACTIONS

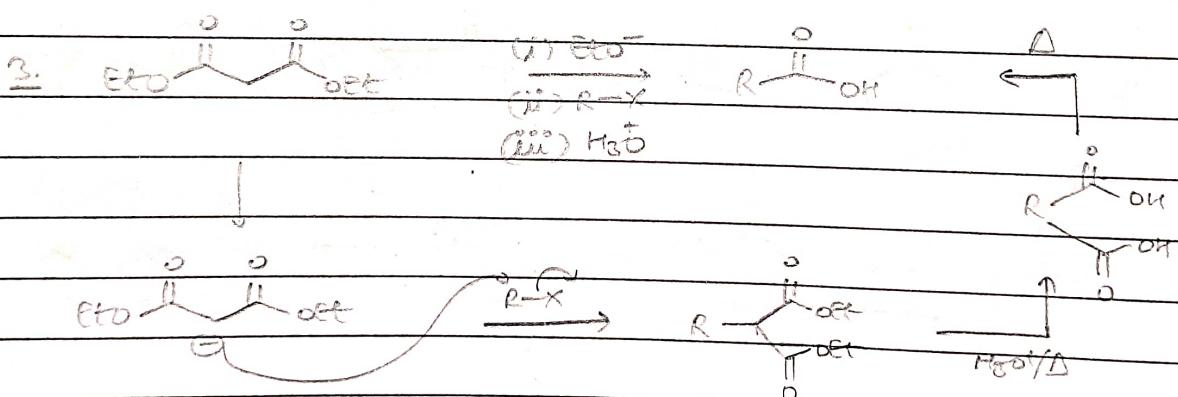
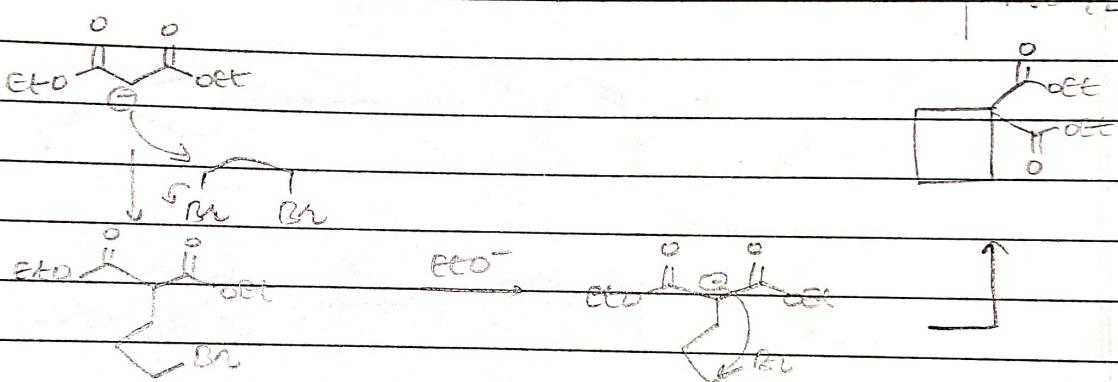
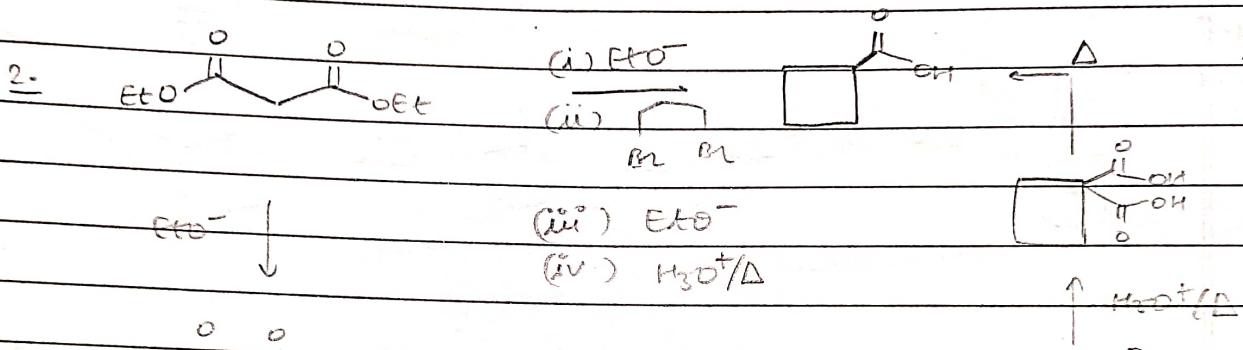
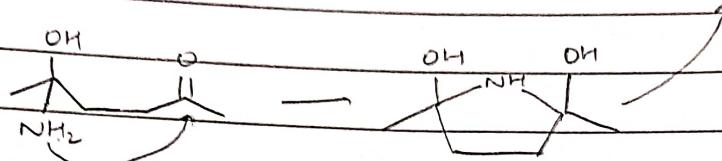
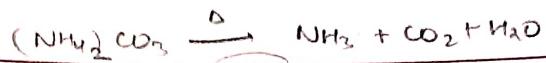


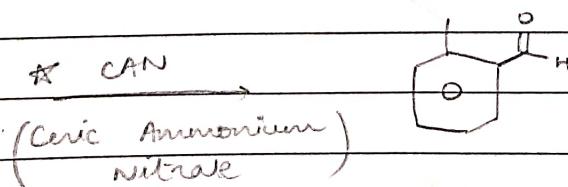
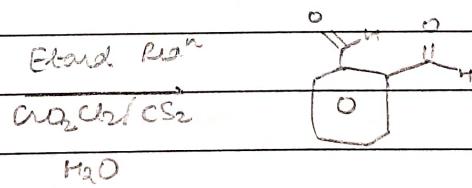
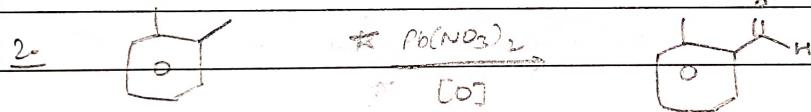
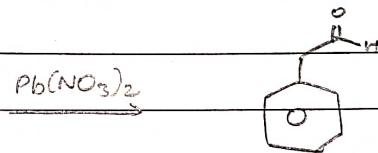
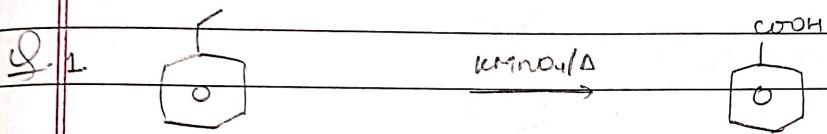
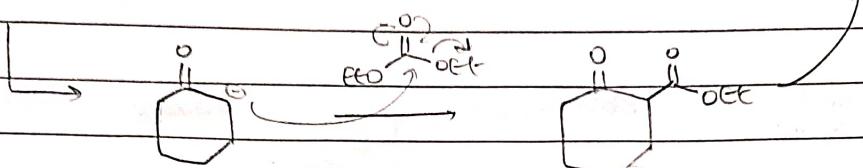
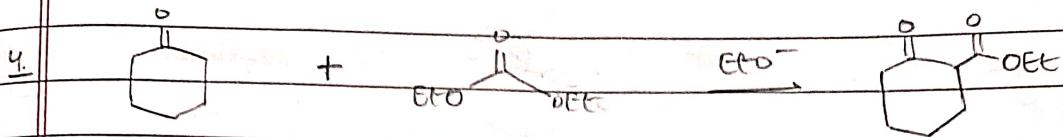


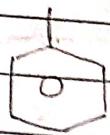
classmate

Date _____
Page _____

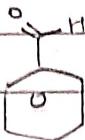
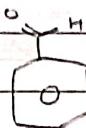








CAN

 $Pb(NO_3)_2$  $\text{CrO}_2\text{Cl}_2/\text{CS}_2$ H_2O 

Q Which give Claisen Ester Condensation?

1.

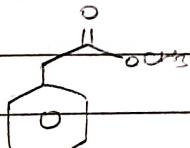
X

2.

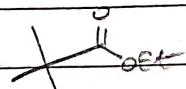
✓

3.

✓

4.

✓

5.

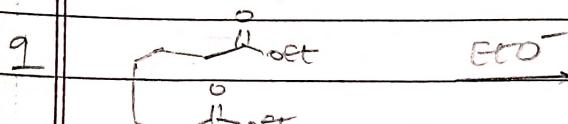
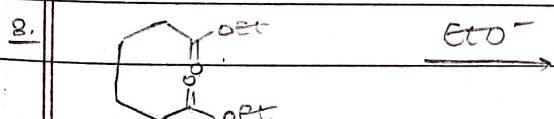
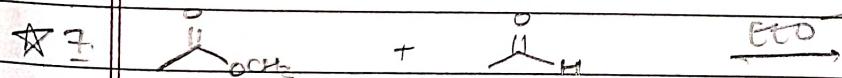
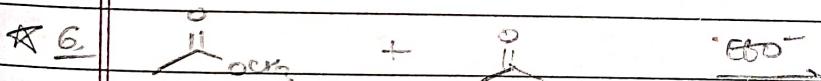
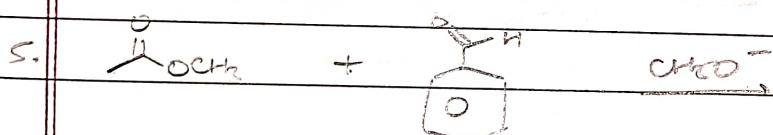
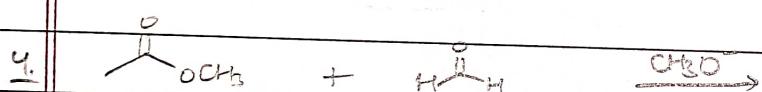
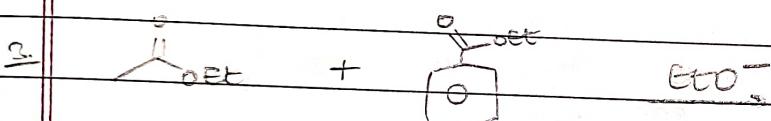
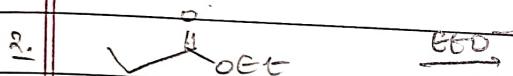
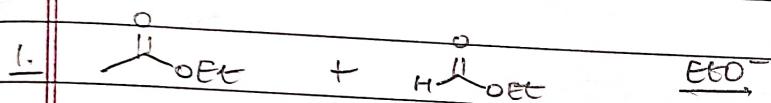
X

NOTE:

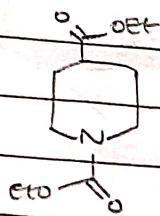
Claisen Ester Condensation in $\text{R}-\text{CH}(\text{OH})-\text{O}-\text{CH}_2-\text{R}'$
 with $\text{Ph}-\text{C}(=\text{O})-\text{Na}^+$
 is irreversible
 (at least one acidic H)

06/07/2023

Q White product with mechanism.



10



EtO^-

(1)

H_3O^+

(2)

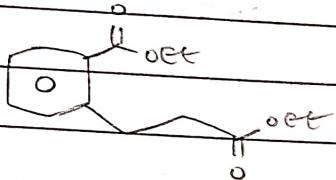
Δ

(3)

NH_2OH^-

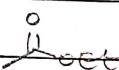
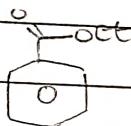
(4)

11.



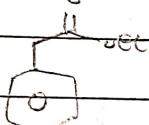
CH_3O^-

12



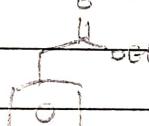
EtO^-

13



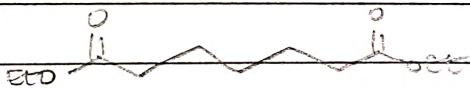
EtO^-

14



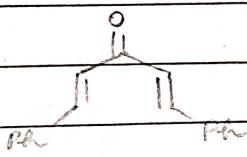
EtO^-

15



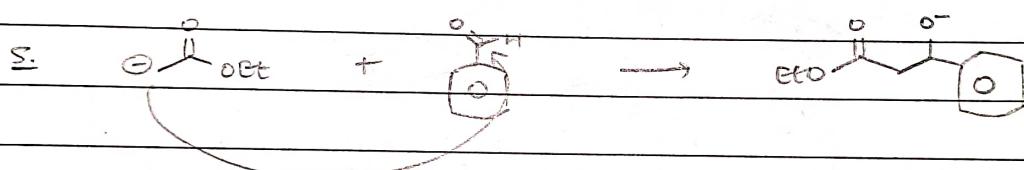
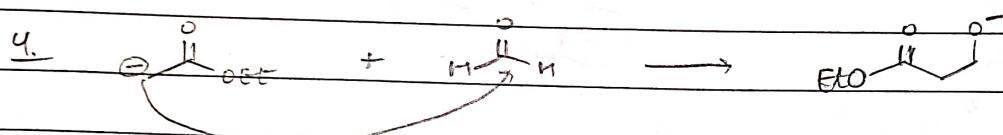
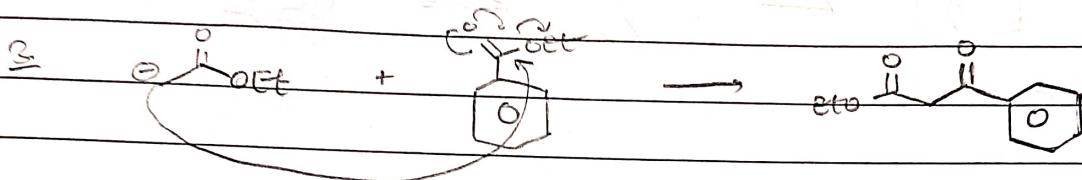
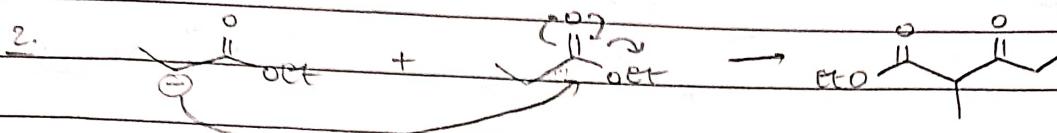
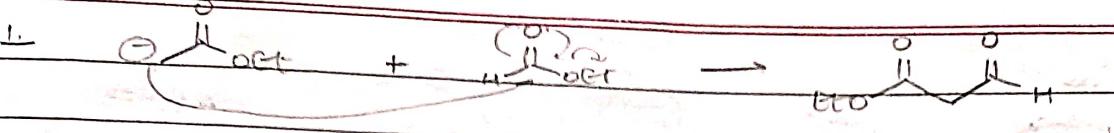
EtO^-

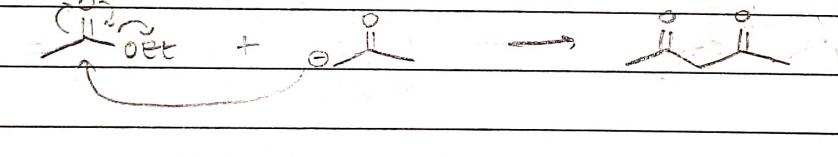
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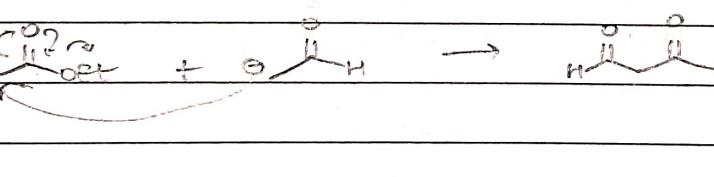


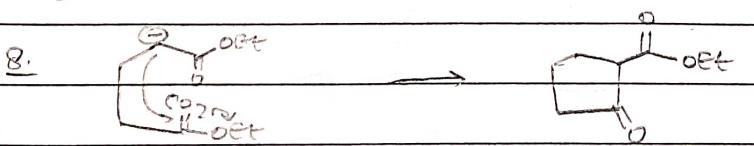
EtO^-

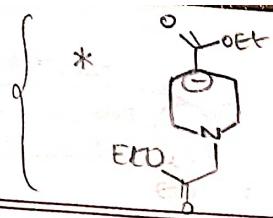
A.



★ 6. 
 (More Acidic H)

★ 7. 
 (More Acidic)





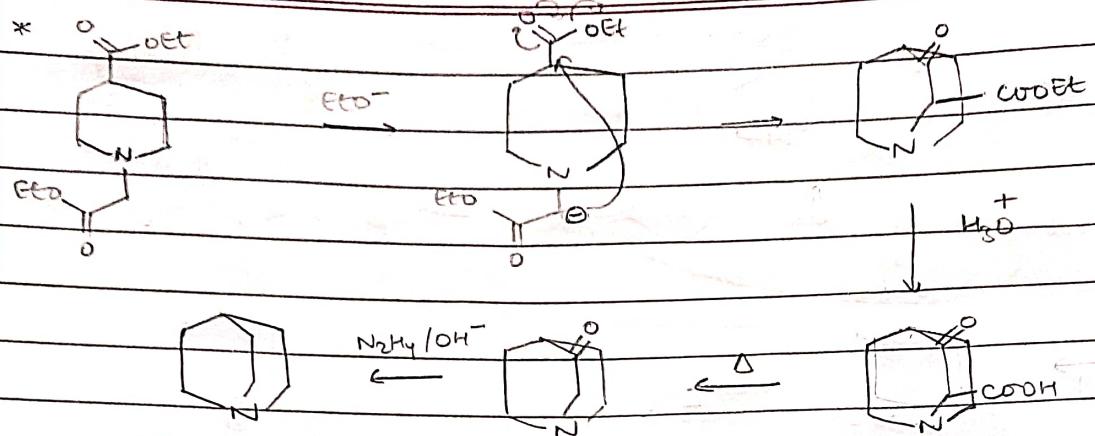
not formed as reaction
reversible & $2\alpha-H$ not
present

classmate

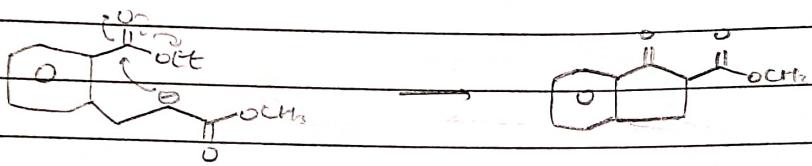
Date _____

Page _____

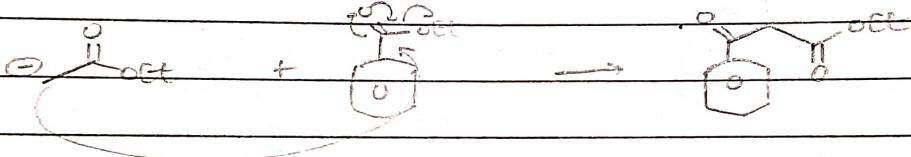
* 10



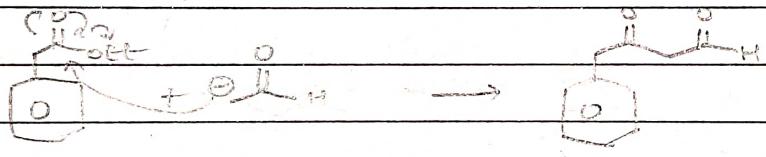
11.



12.

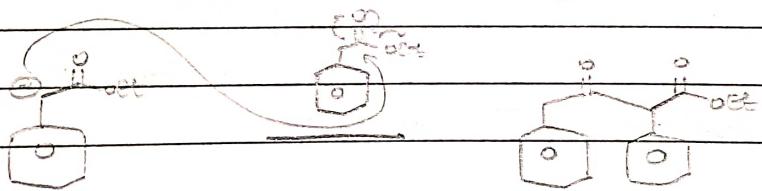


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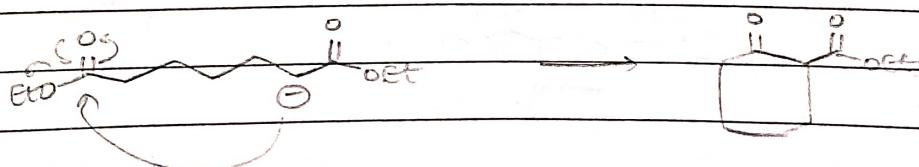


(More acidic)

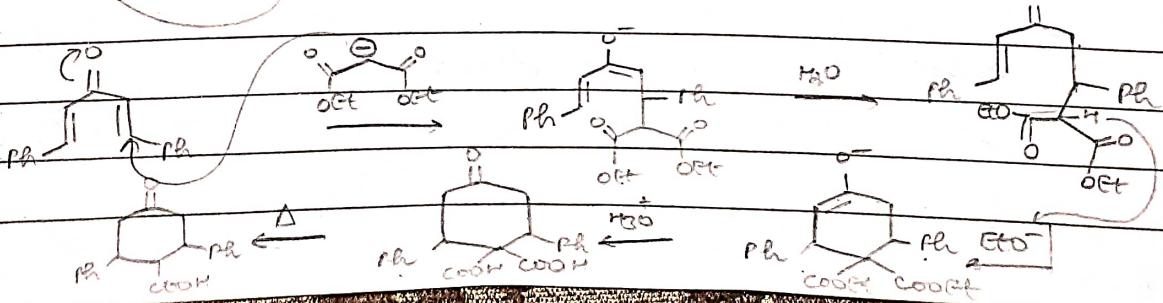
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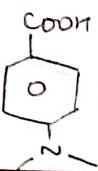


15.



16.





reacts with NaHCO_3

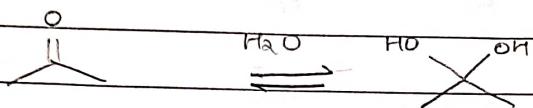
classmate

Date _____

Page _____

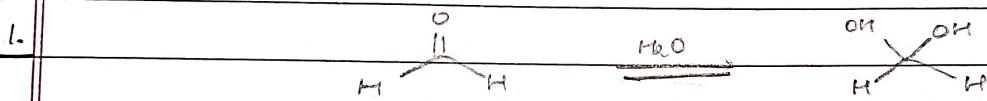
11/07/2023

GEM DIOLS

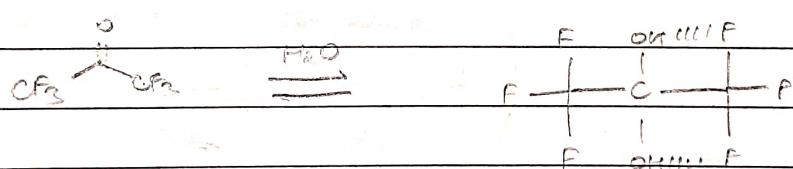
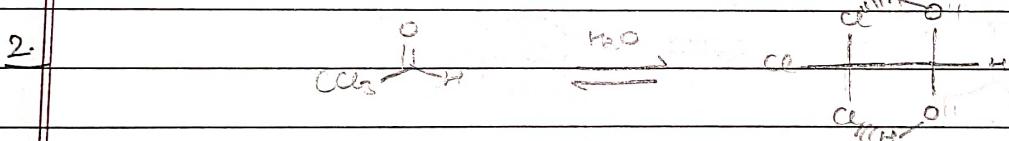


Generally, gem diols are unstable, so NaHCO_3 goes bwd.

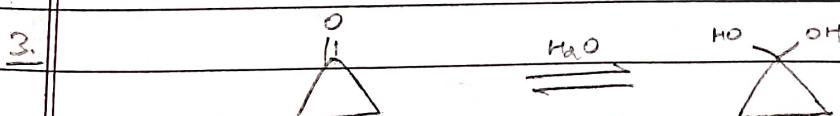
Stable gem diols :-



Rate of Nu acid⁻ extremely high

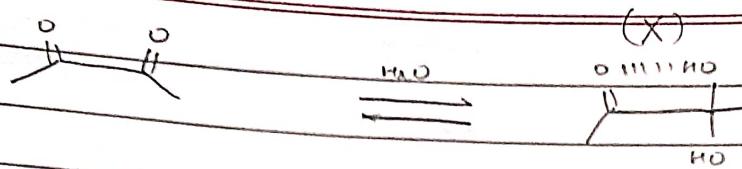


(Intramolecular H-bonding)

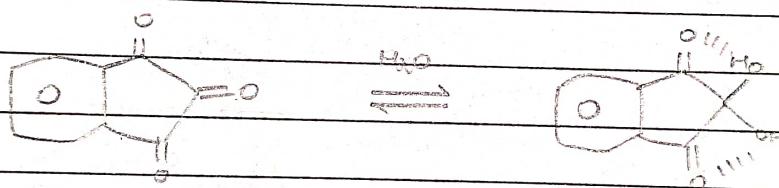
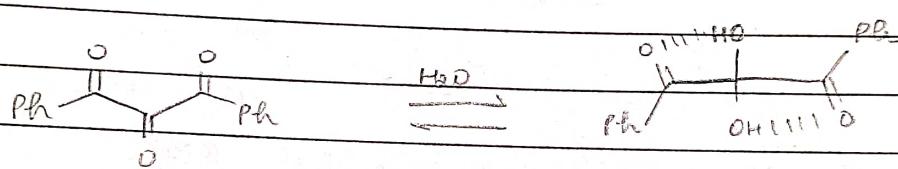
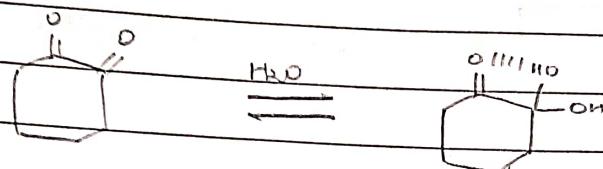


(in ring)
strain

4.

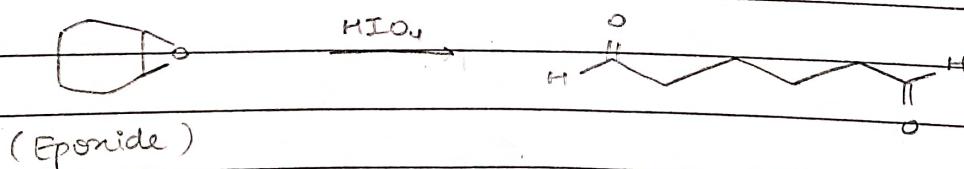


Not stable as no H-bonding
due to free rotation

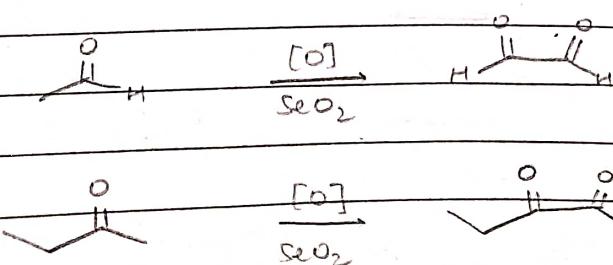


(Intramolecular H-bonding)
due to lack of
free rot'n

NOTE:

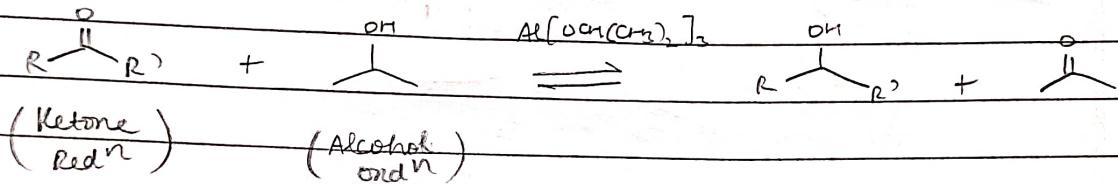


2.



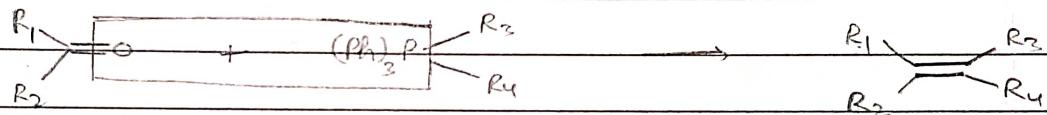
MISC REACTIONS

• Meerwein - Ponndorf - Verley Redn (MPV) -

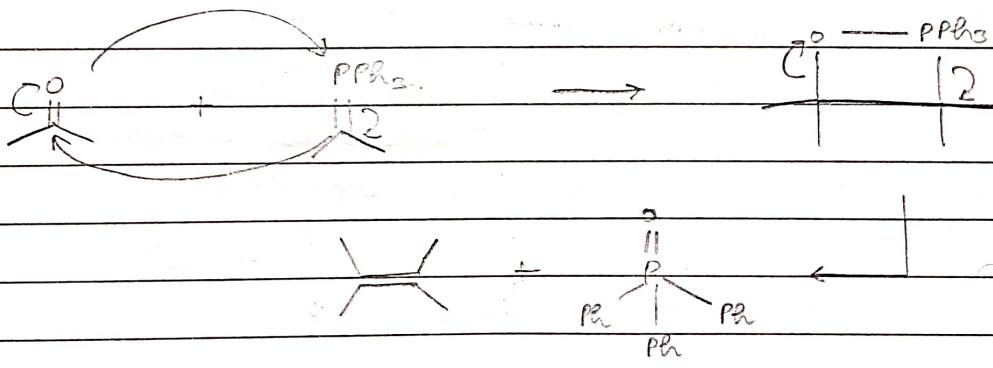
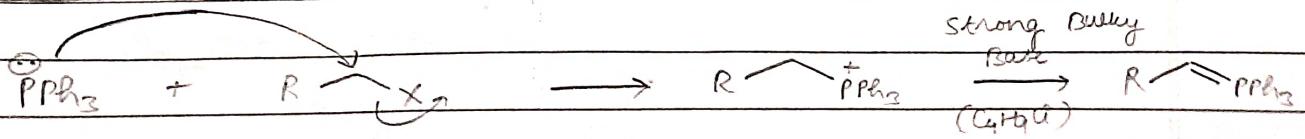


Reverse of this reaction is known as Oppenauer's Redn

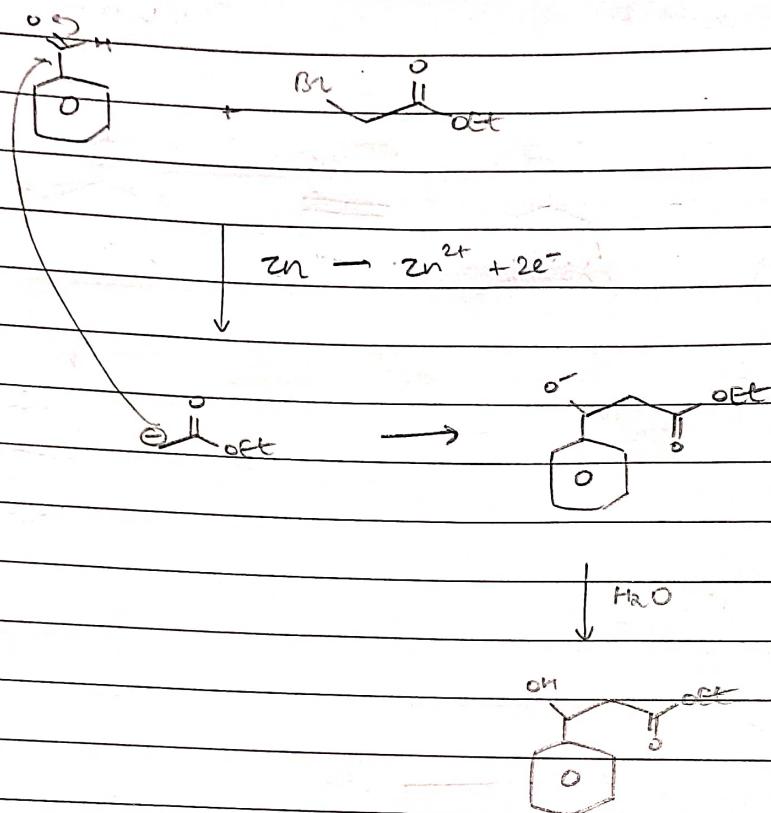
• Wittig Reacn -



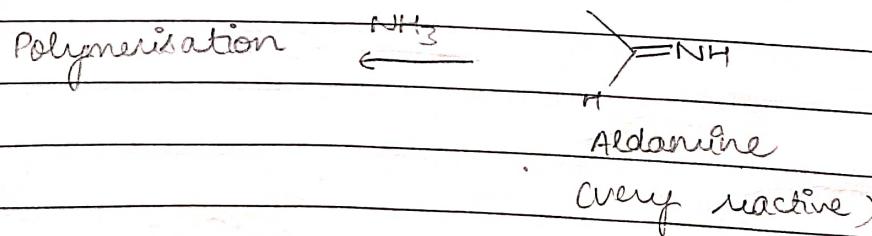
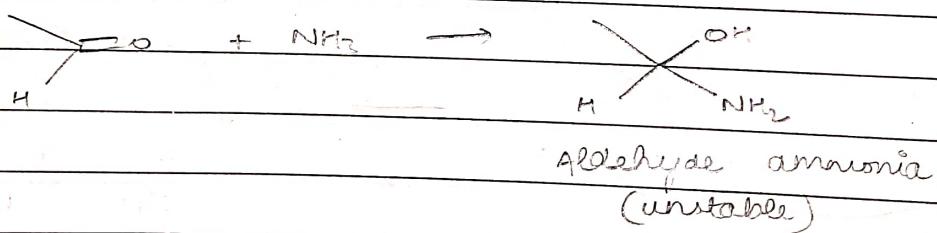
Mechanism

Prepn of $\text{Ph}_3\text{P}=\text{C}\text{---R}_3-\text{R}_4$ 

Reformatski reaction

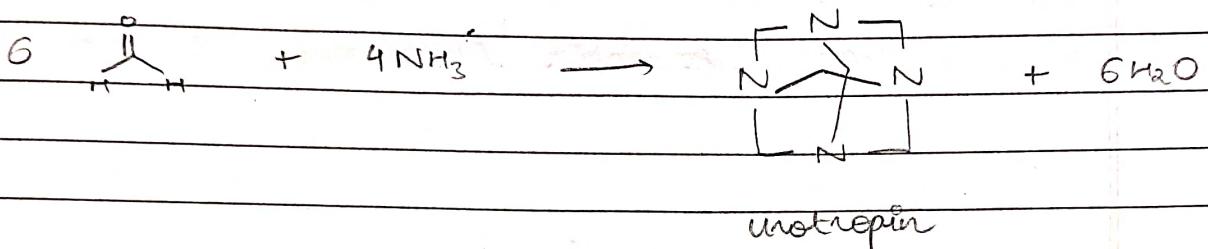


REACTION OF AMMONIA & ALDEHYDE



NOTE:

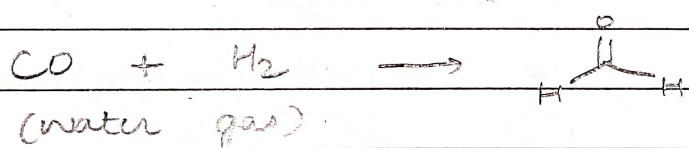
Reacⁿ b/w NH_3 & HCHO does not form aldehyde, but gives hexamethylenetetramine, used in medicine as a urinary antiseptic under the name Urotropin.



FORMALDEHYDE

→ Prepⁿ

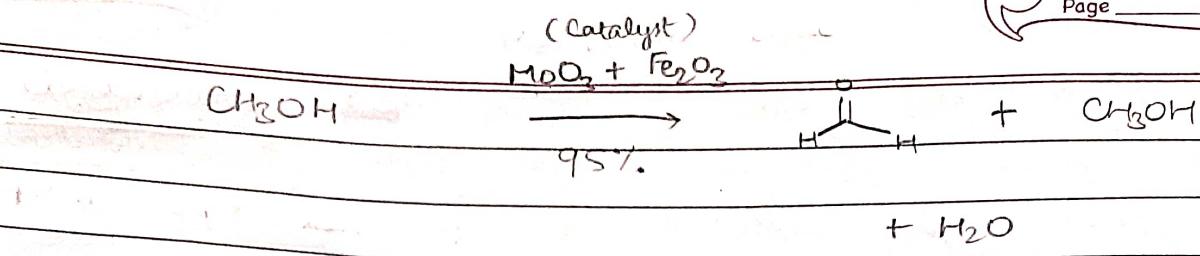
- (1) Redⁿ of CO - At low P through electric discharge of low intensity



- (2) Oxidn of CH_3OH - Mix of CH_3OH vapour and air passed over heated Cu or Ag

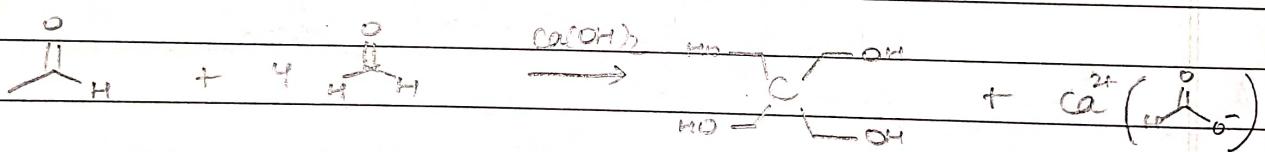
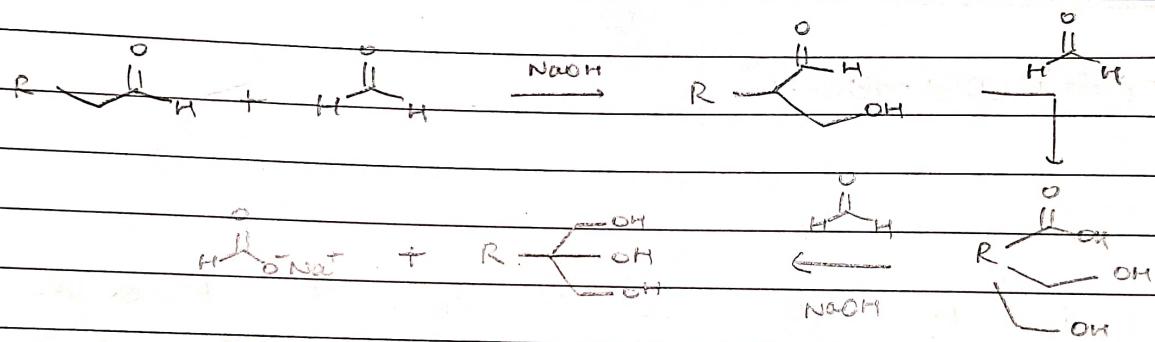


(3)



The min is freed from excess of methanol by distillation, which results in a min known as formalin (40% HCHO, 8% CH₃OH, 52% H₂O)

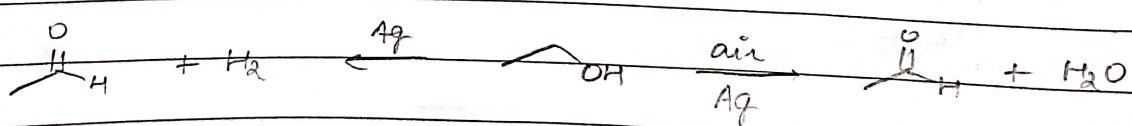
→ Condensation Reacⁿ



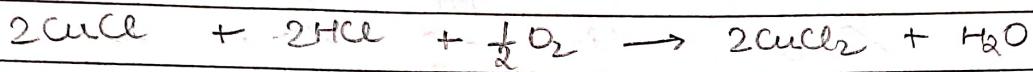
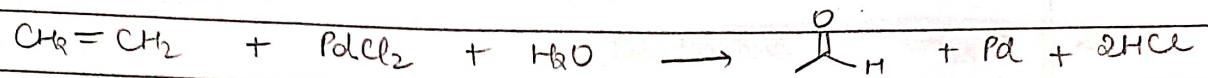
ACETALDEHYDE

→ Prepⁿ (Industrial)

(1) Air oxidn of CH_3OH - At 300°C



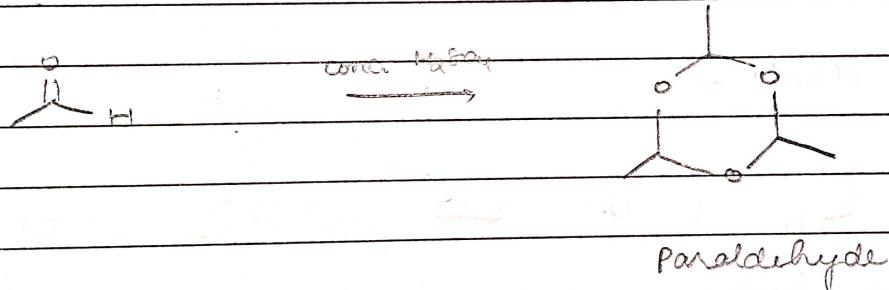
(2) At 50°C



→ Physical pts

- Colourless
- Pungent smelling lg.
- B.P = 21°C

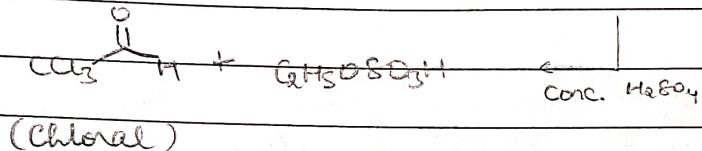
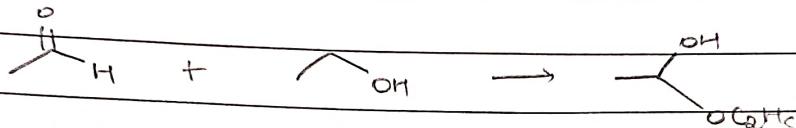
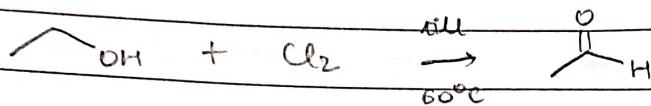
→ Polymers



CHLORAL

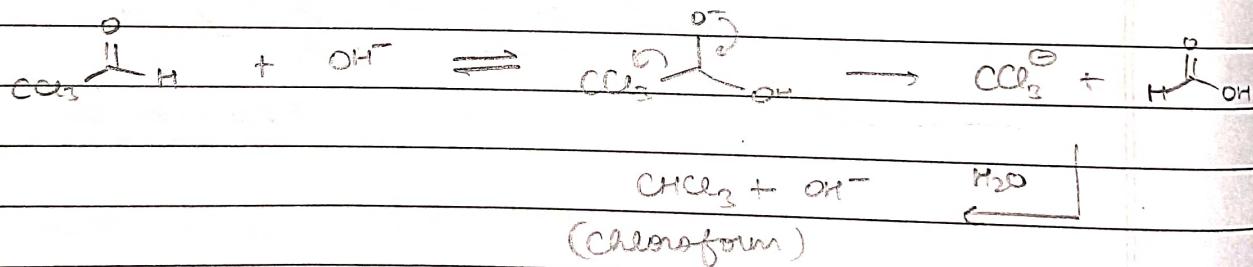
→ Prep (Industrial)

Chlorination of CH_3OH -



→ Reac

① with Alkali -



② with Acids -

