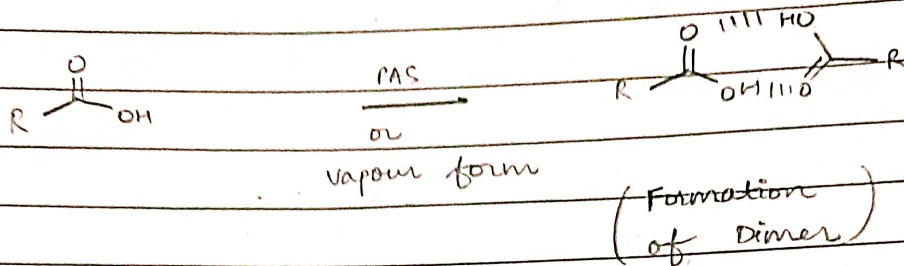
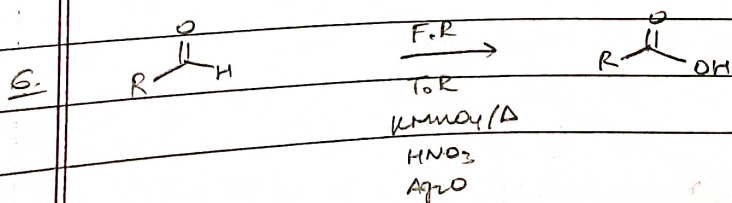
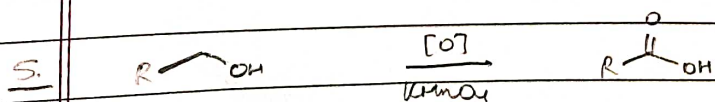
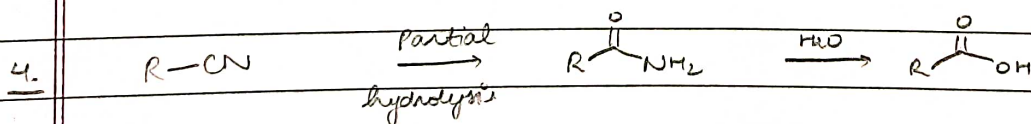
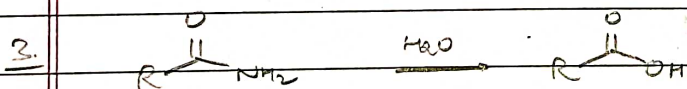
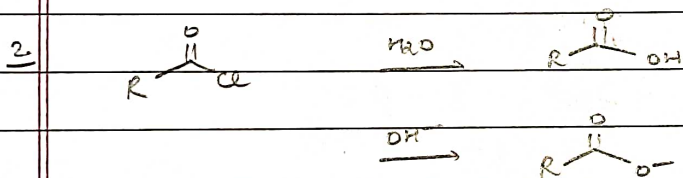
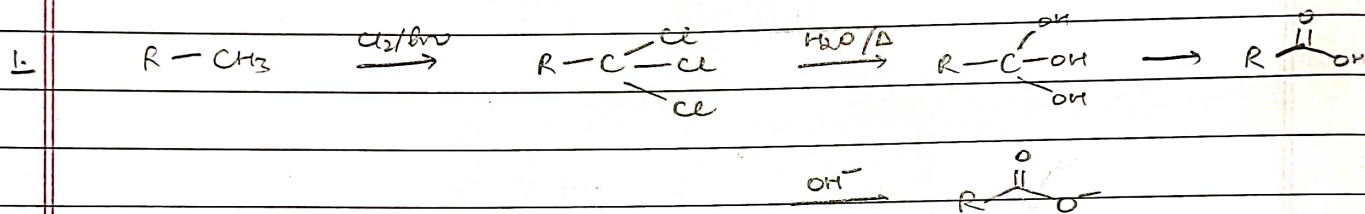


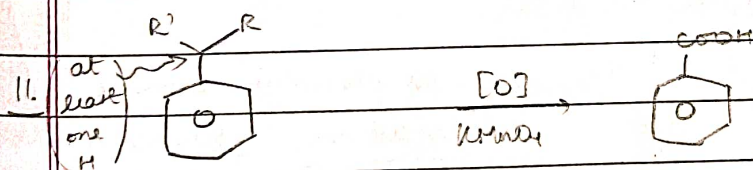
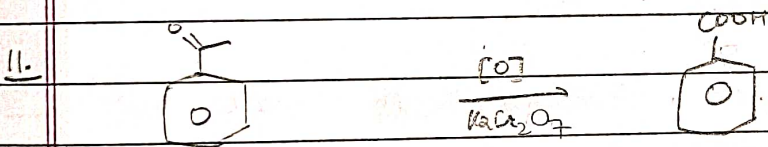
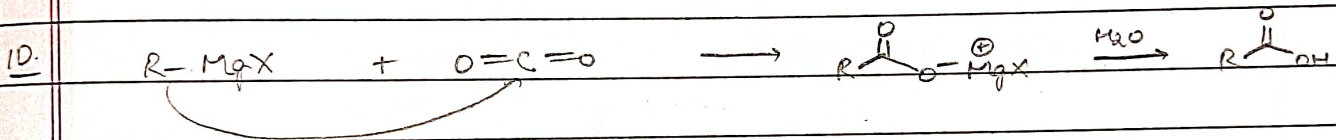
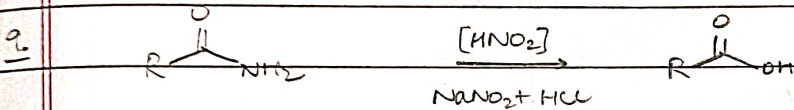
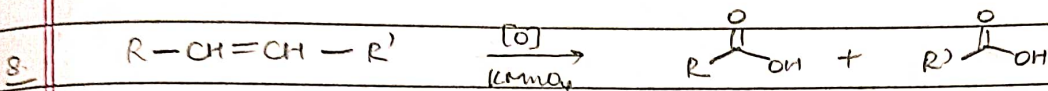
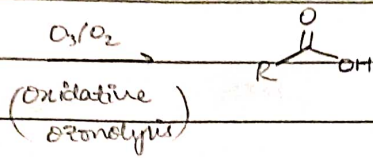
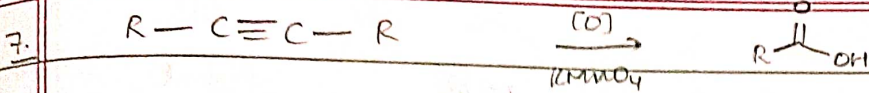
# CARBOXYLIC ACIDS AND ITS DERIVATIVES

11/07/2022



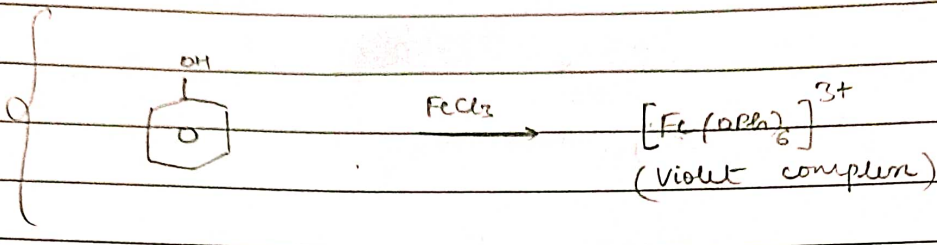
## PREP<sup>n</sup>



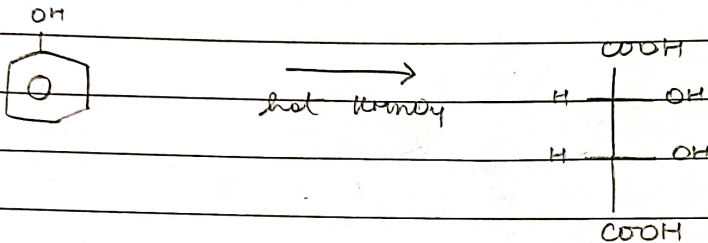


NOTE:

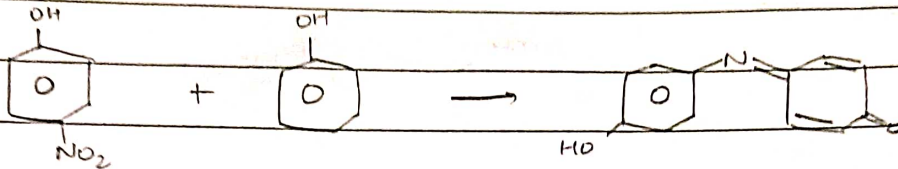
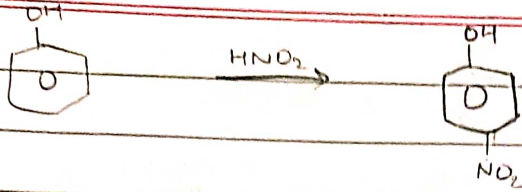
1. If any comp. give colouration with neutral  $FeCl_3$ , it is enol or phenol. (generally violet)



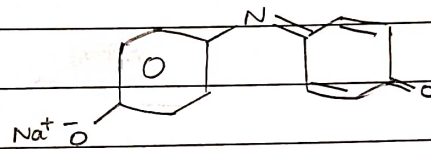
2.

→ Detection of phenolic Group

- ① Litmus test - Colour changes to red if liq. or crystal of comp. placed on moist blue litmus paper.
- ② Neutral  $FeCl_3$  test - If colouration (usually purple, blue or green) observed on  $ne^n$  with neutral  $FeCl_3$ , comp. is enol or phenol.
- ③ Liebermann's test - Green or Blue colouration test on  $ne^n$  with  $NaNO_2$  & 1ml conc.  $H_2SO_4$ .  
If  $sol^n$  poured into excess water → Red  $sol^n$   
further excess  $NaOH$  → Blue/Green  $sol^n$



indophenol (Red)



indophenol anion (Blue)

$\rightarrow$  Test for Alcohol

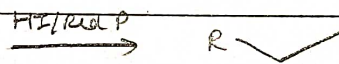
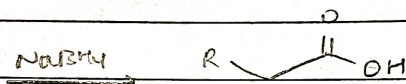
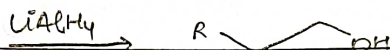
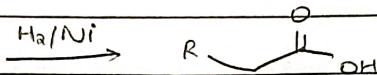
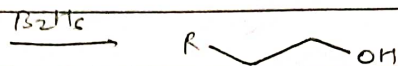
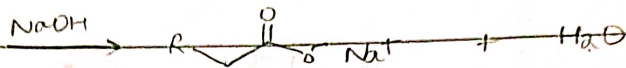
① CAN Test — 1° & 2° Aliphatic alcohol give

(Ceric Ammonium Nitrate)  $\checkmark$  red color on react with CAN.

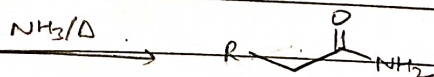
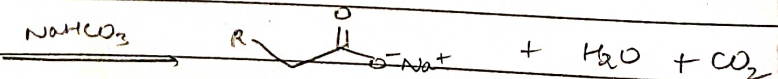
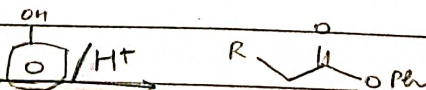
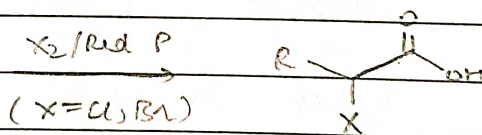
3° Aliphatic alcohol do not give CAN test.

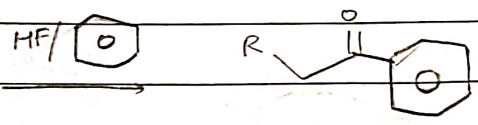
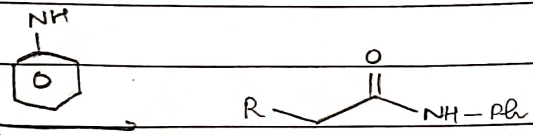
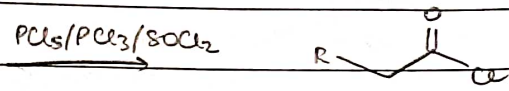
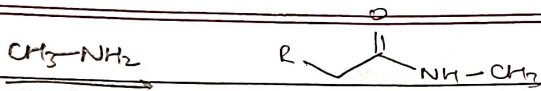
Benzyl alc. & Phenol give +ve CAN test

## REACTIONS

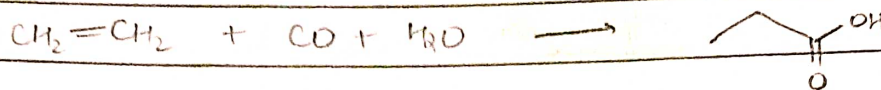


(Hell Volhard  
Zelensky  
regr)

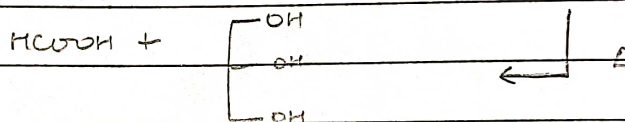
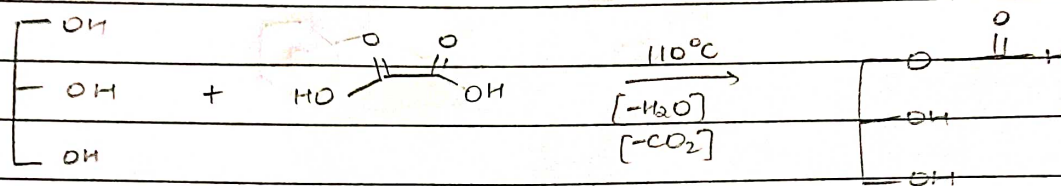




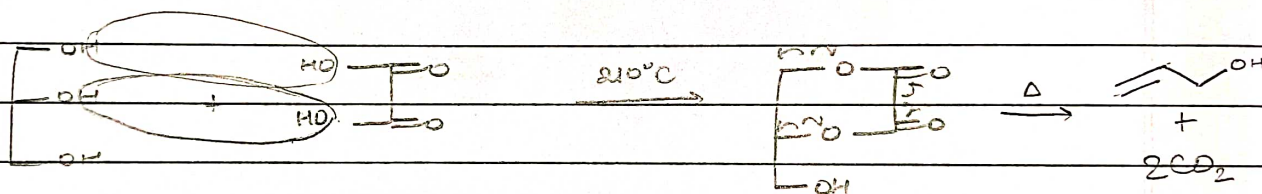
• Koch reaction



• Prep<sup>n</sup> of Formic Acid

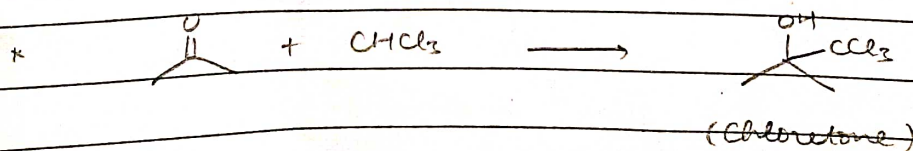
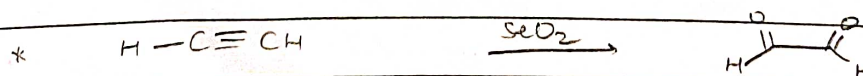
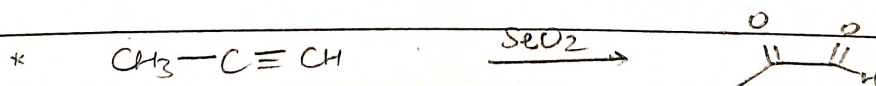


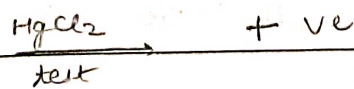
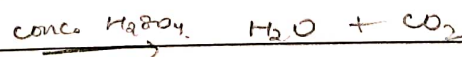
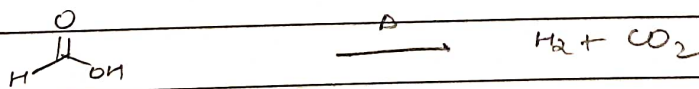
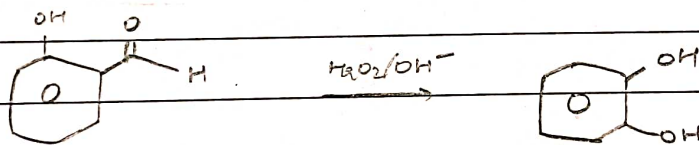
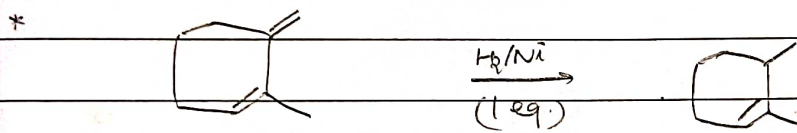
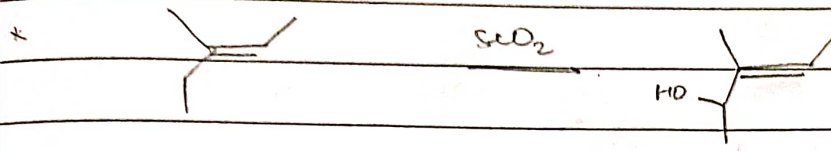
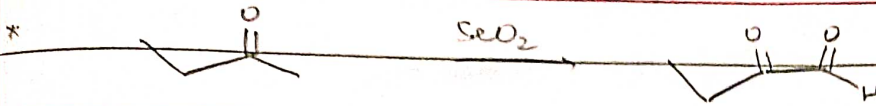
NOTE:



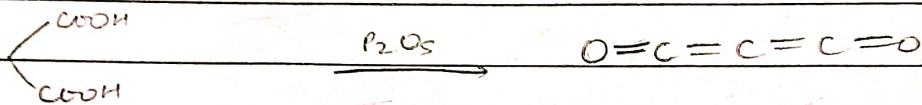
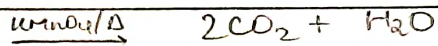
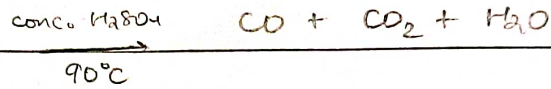
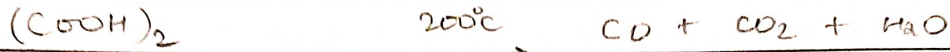
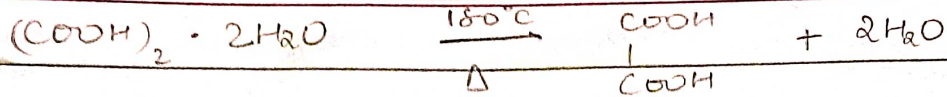
\* (For AITS Only)

→ Misc. Rea<sup>n</sup>

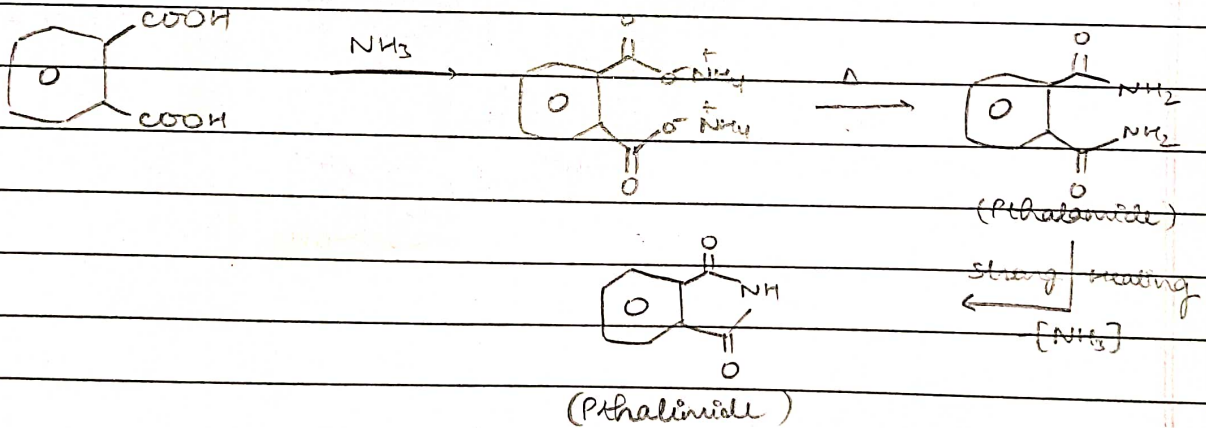
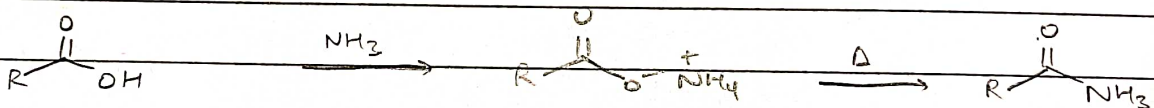




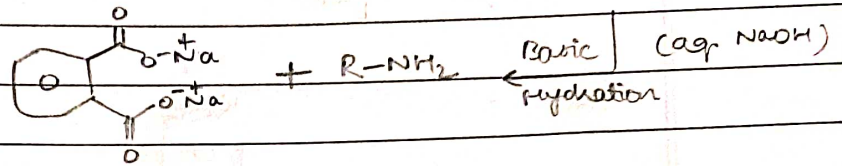
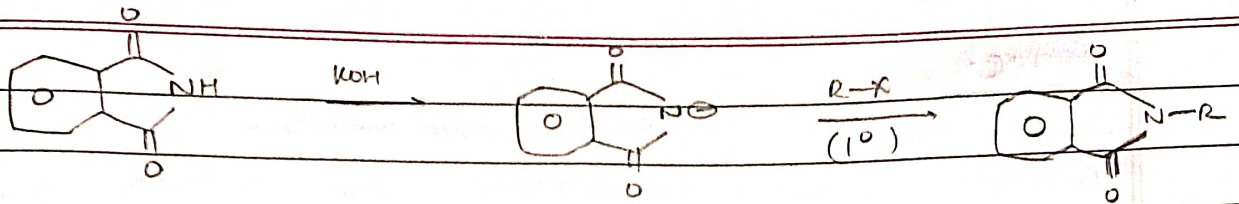




→ With NH<sub>3</sub>

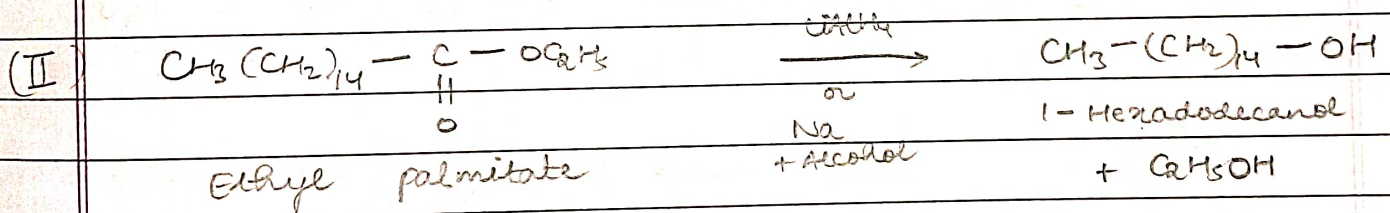
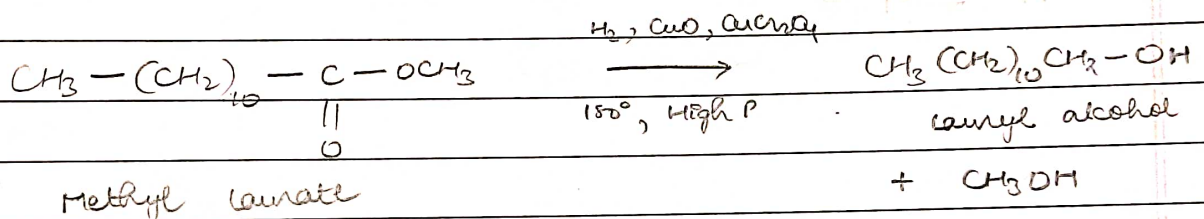


- Gabriel - Phthalimide re<sup>n</sup> - Used to prepare aliphatic 1<sup>o</sup> amines



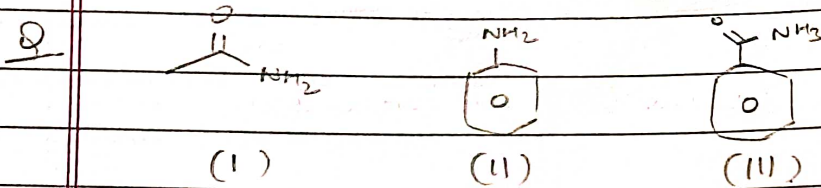
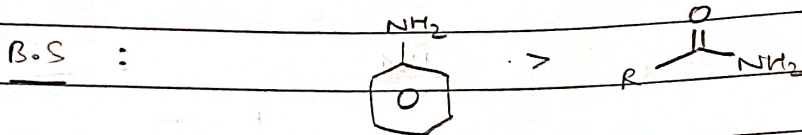
## → Red<sup>n</sup> of Esters

### (I) Catalytic Hydrogenation

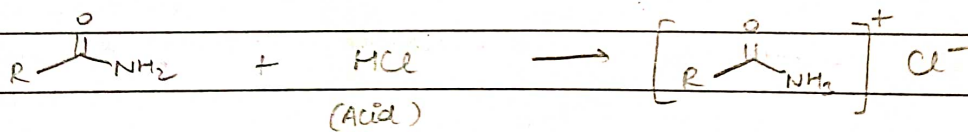
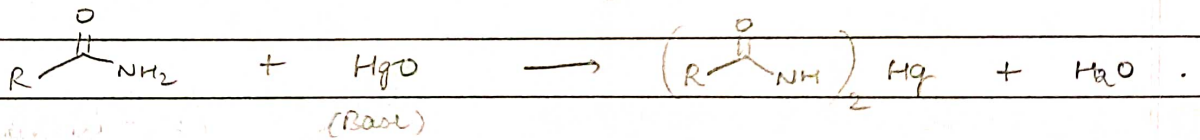


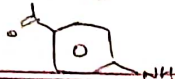
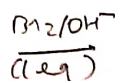
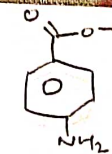
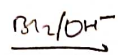
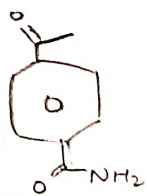
## AMIDES

Amides are amphoteric in nature  
& is feebly basic. i.e



A. (II) > (I) > (III)  
↳ (more conj)





$\left[ \because \text{OH}^- \text{ first behave like Base} \right]$

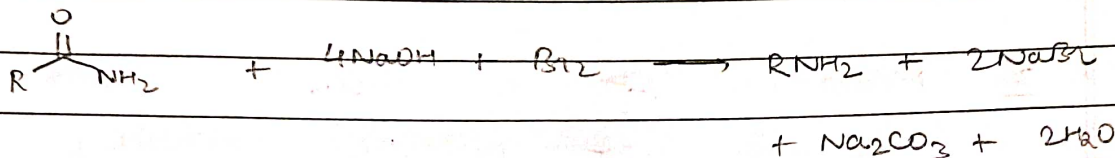
classmate

Date \_\_\_\_\_

Page \_\_\_\_\_

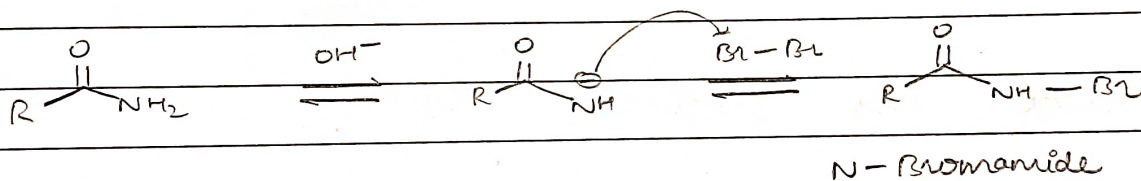
→ Hoffmann-Bromamide Rean

or Hoffmann Degradation



Reagents :  $\text{Br}_2/\text{OH}^-$ ,  $\text{Br}_2/\text{NaOH}$ ,  $\text{Br}_2/\text{KOH}$ ,  $\text{Br}_2/(\text{CaOH})_2$ ,  $\text{Br}_2/(\text{BaOH})_2$   
 $\text{KOBBr}$ ,  $\text{NaOBr}$   
 $\text{Br}_2/\text{Base}$

Mechanism



N-Bromamide  
 (I<sup>st</sup> intermediate)

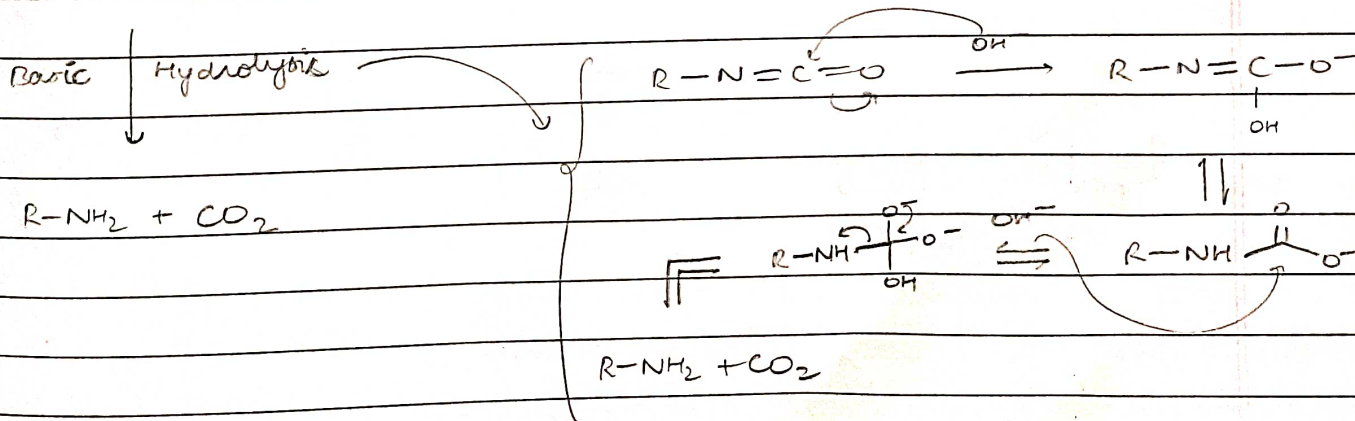


Alkyl cyanate

(III<sup>rd</sup> intermediate)

N-Bromamide ion

(II<sup>nd</sup> intermediate)



$\text{R}-\text{NH}_2 + \text{CO}_2$

$\text{R}-\text{NH}_2 + \text{CO}_2$

NOTE:

1. Rean is purely intramolecular

2. Product is 1° amine

3. Migration of R group prevents formation of Nitrene (unstable)

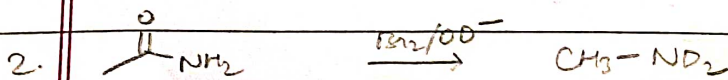
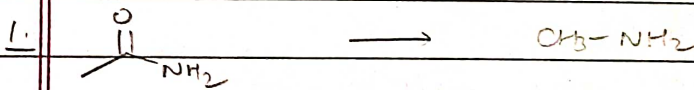
∴ Nitrene is not an intermediate

4. Retention in migration (rdi)

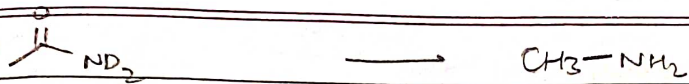
5. H of N in product come from medium of basic hydrolysis, not the reactant.

Q Write the product

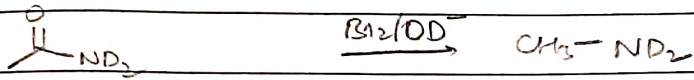
(Medium  $\text{RN}_2/\text{OH}^-$  unless specified)



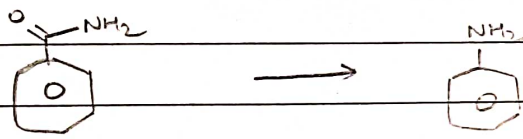
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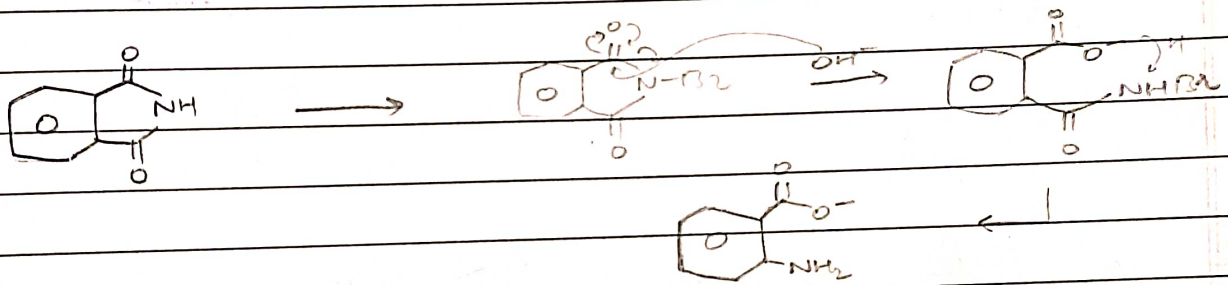
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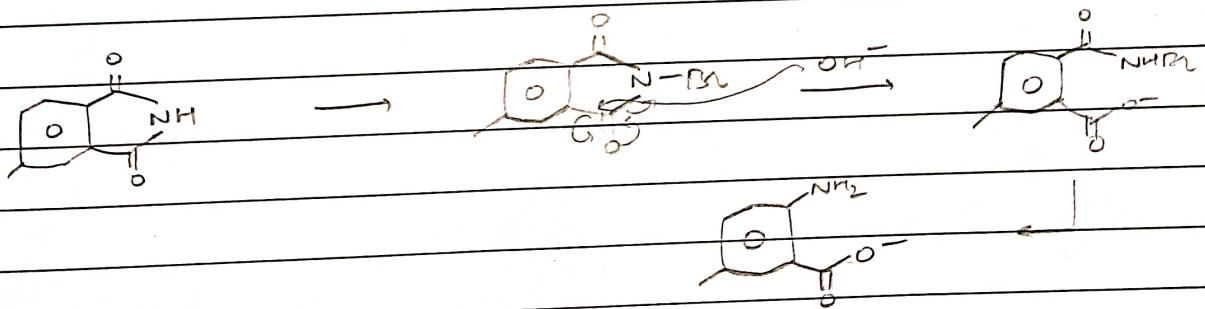
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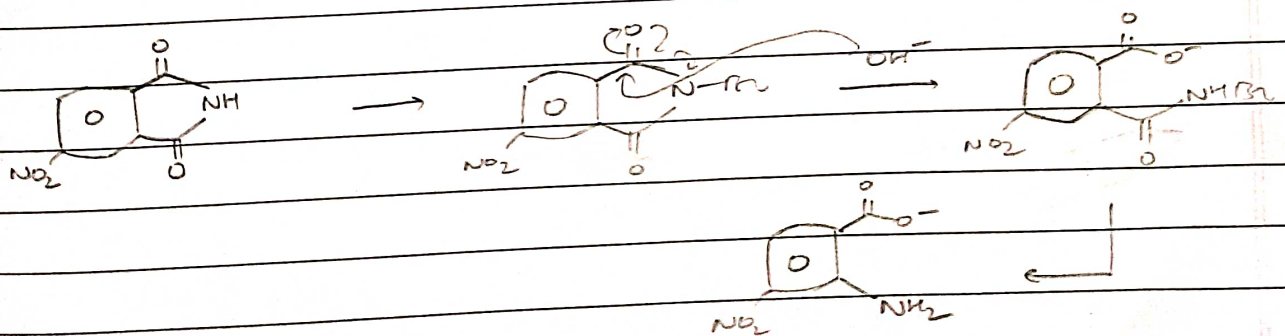
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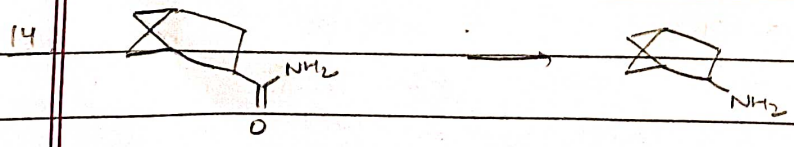
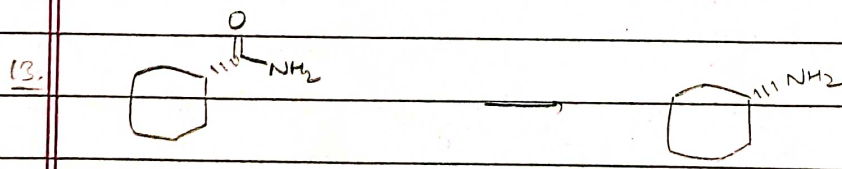
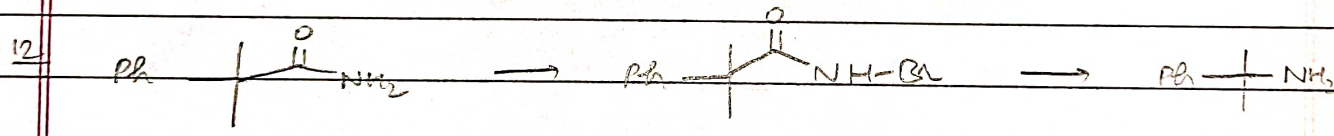
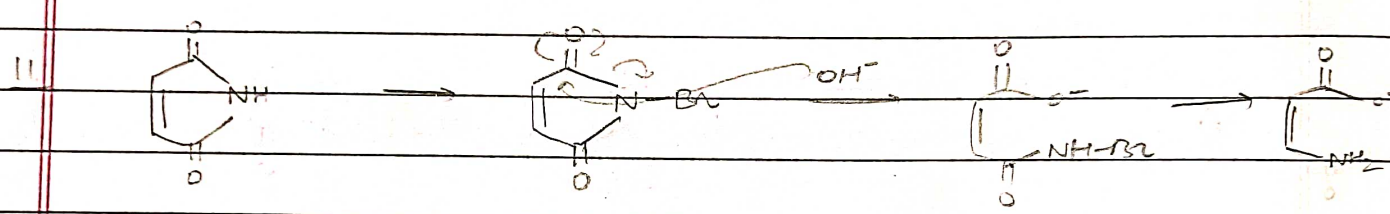
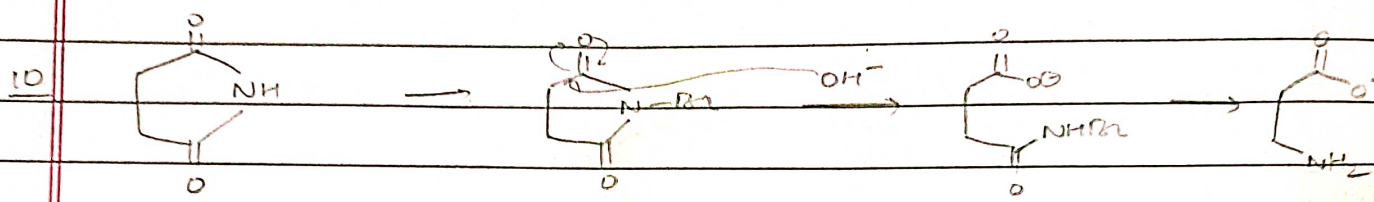
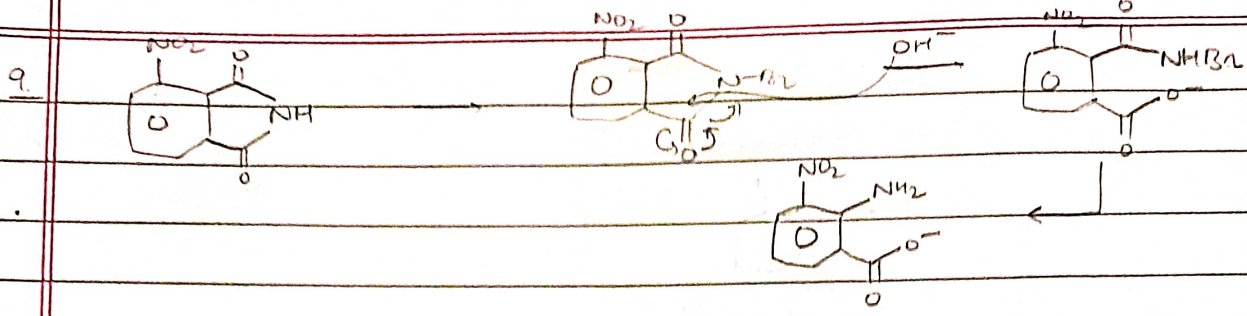


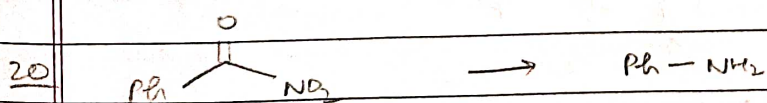
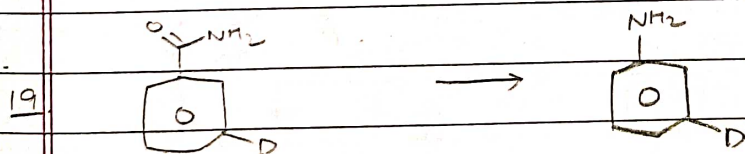
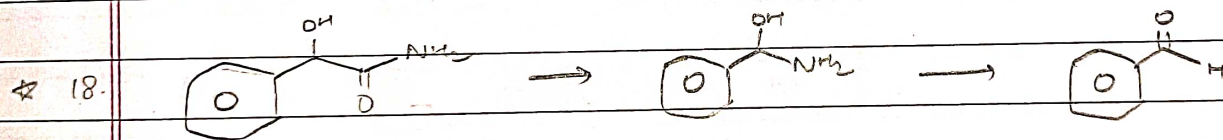
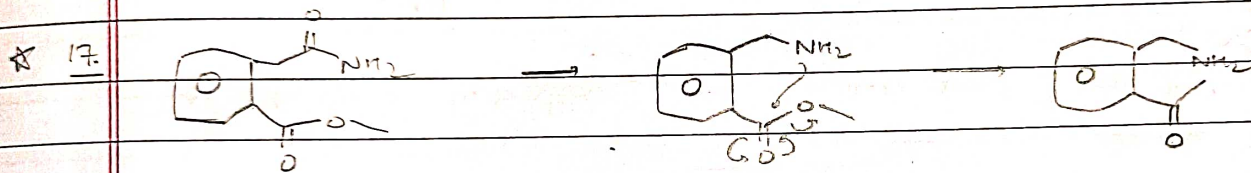
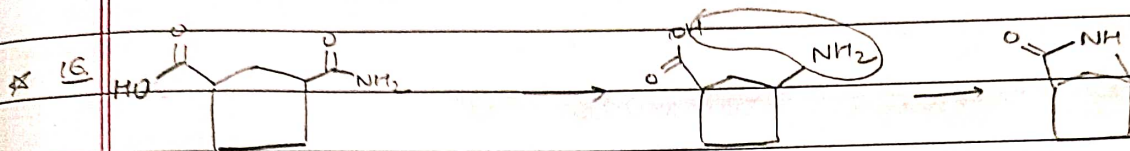
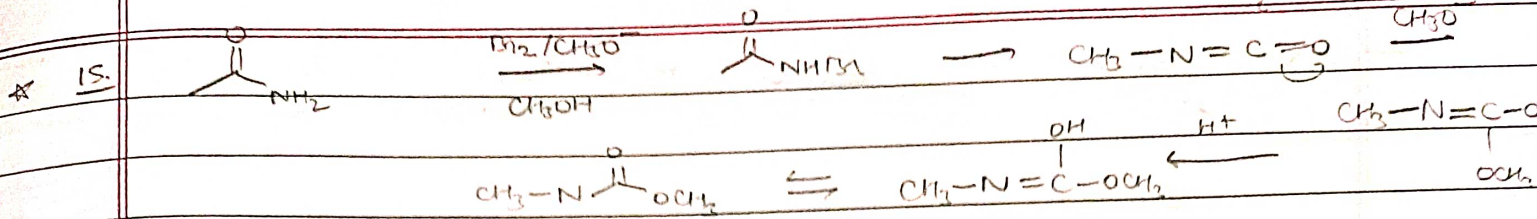
7.



8.

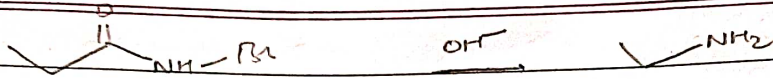






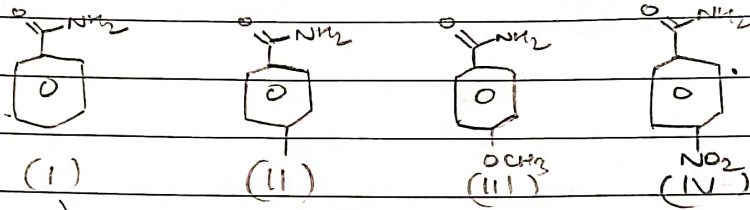


21.

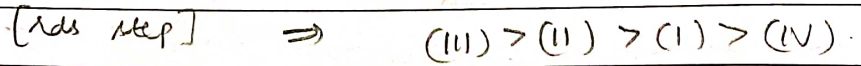


★ 22.

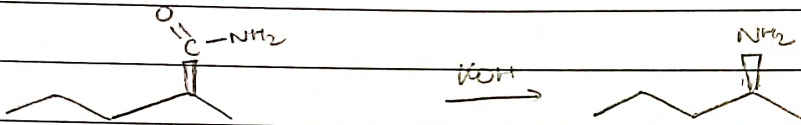
Rate of Hoffmann Bromamide Rea<sup>n</sup>



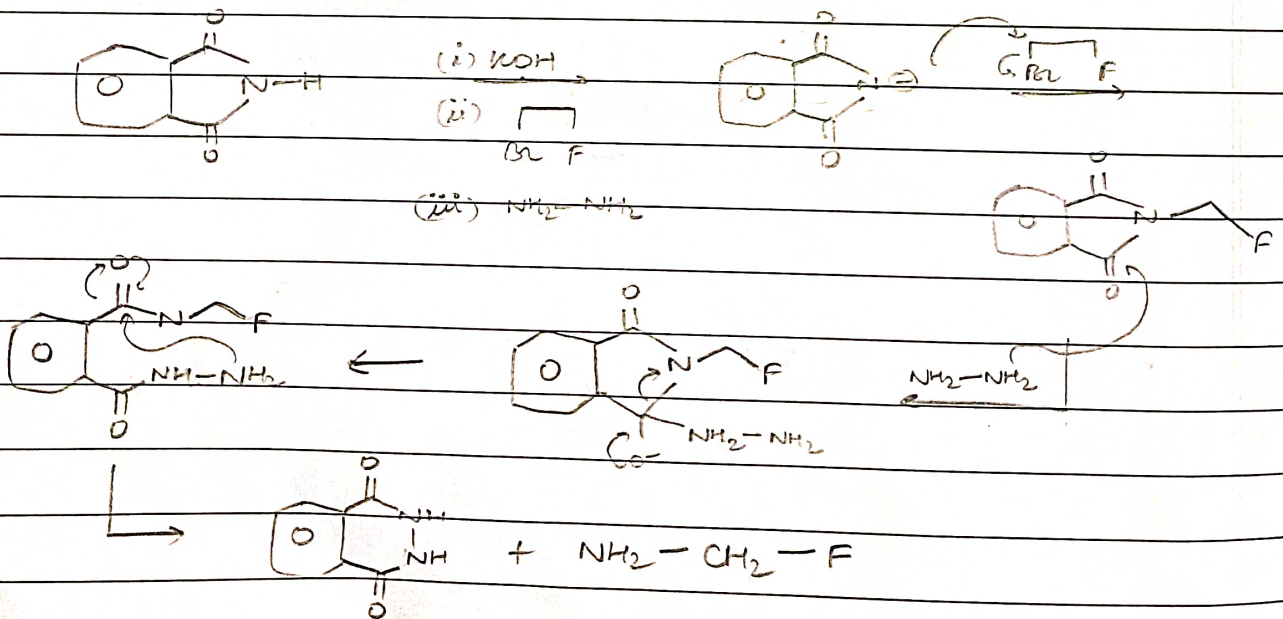
(α Migration tendency of -R group)



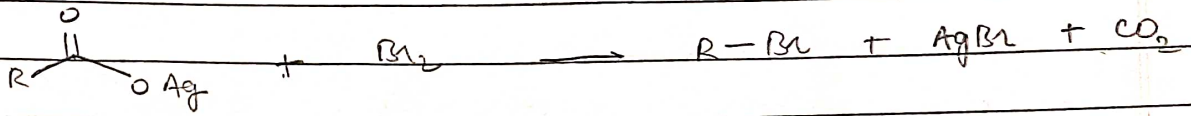
23.



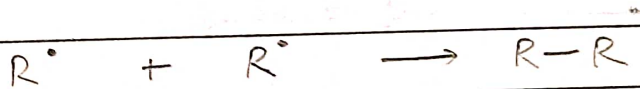
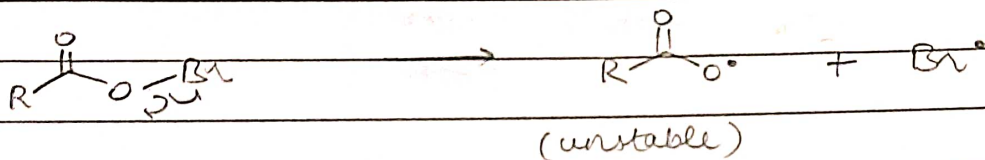
★ 24.



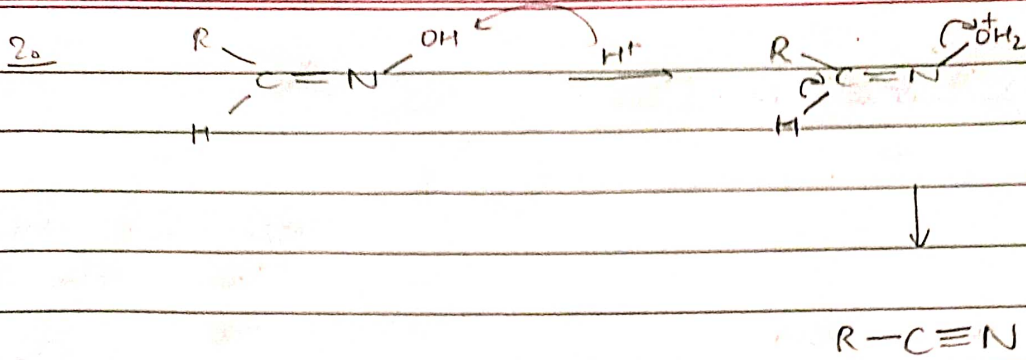
• Hunsdiecker reaction — (Only in case of Br)



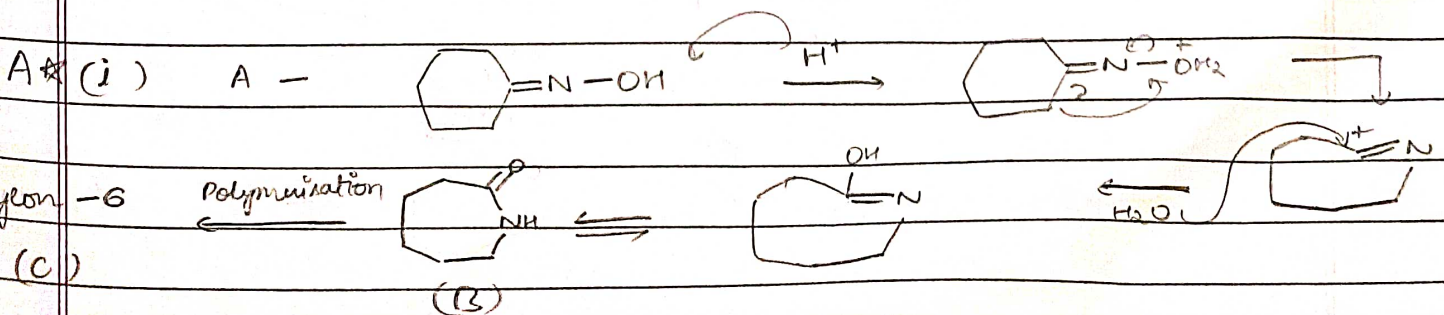
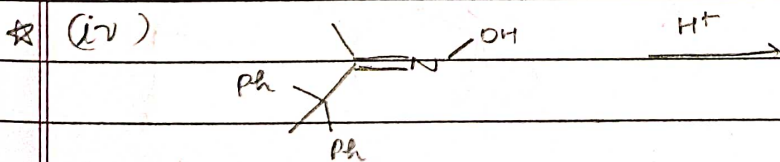
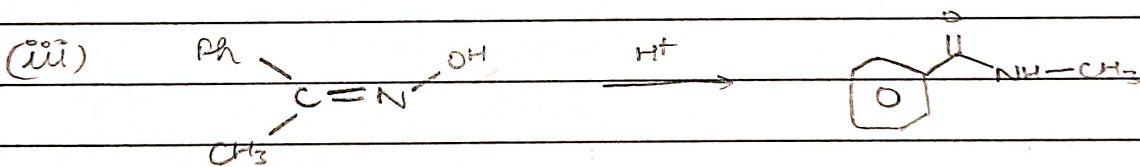
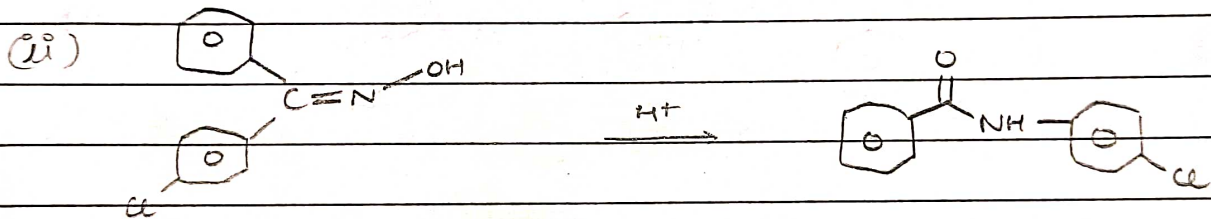
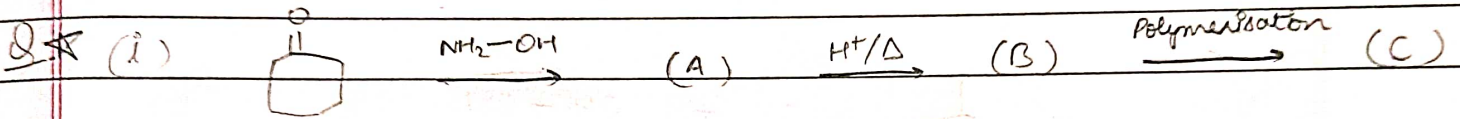
Mechanism



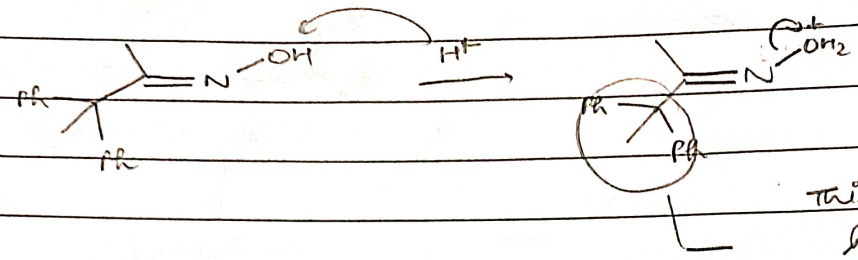




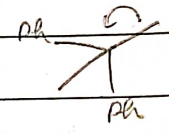
3. Retention of migrating group.



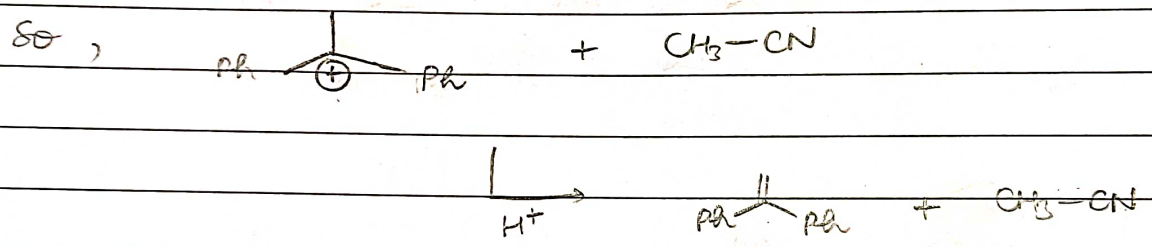
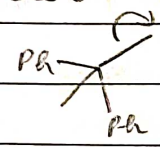
\* (iv)



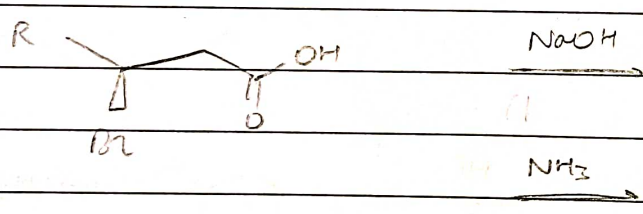
this bond should have been broken like



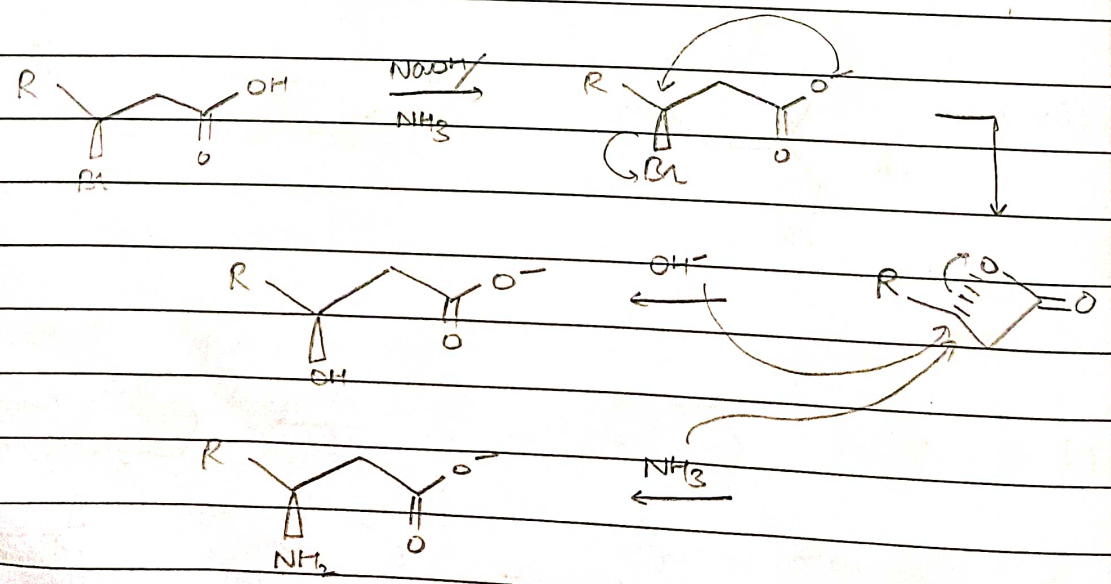
But, due to it being extremely bulky, it rather breaks like



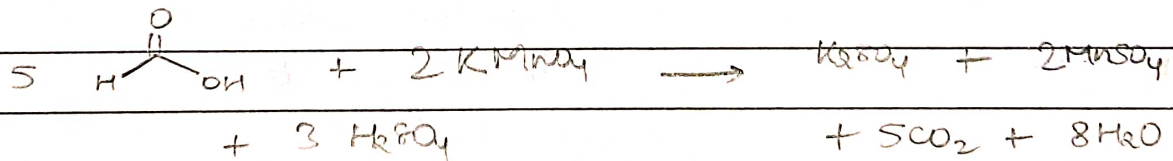
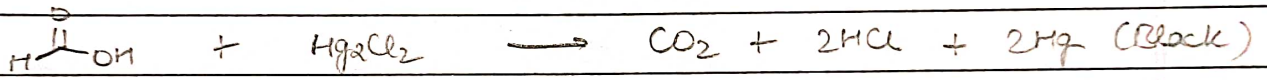
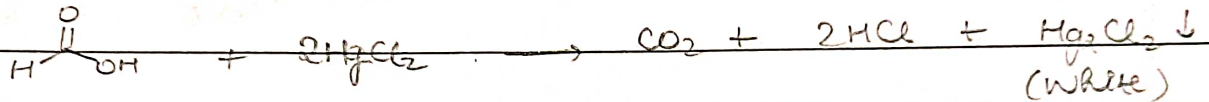
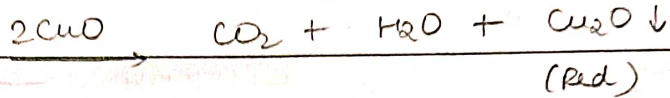
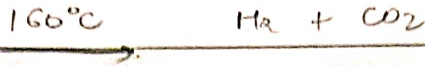
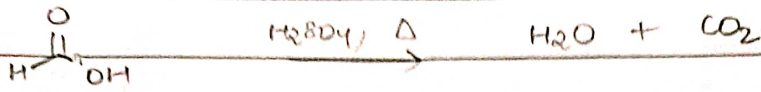
\* Q



A.



FORMIC ACID



NOTE:

