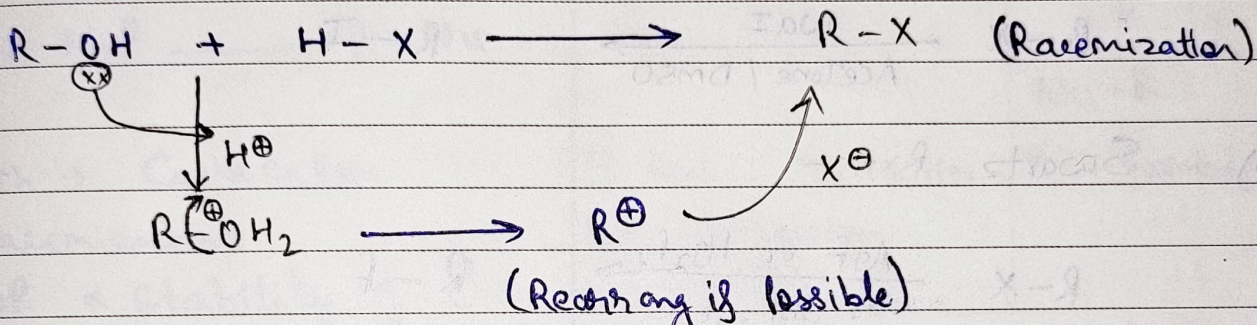


JMPS

Halogen Comp.  
Alcohol + Phenol + Ether

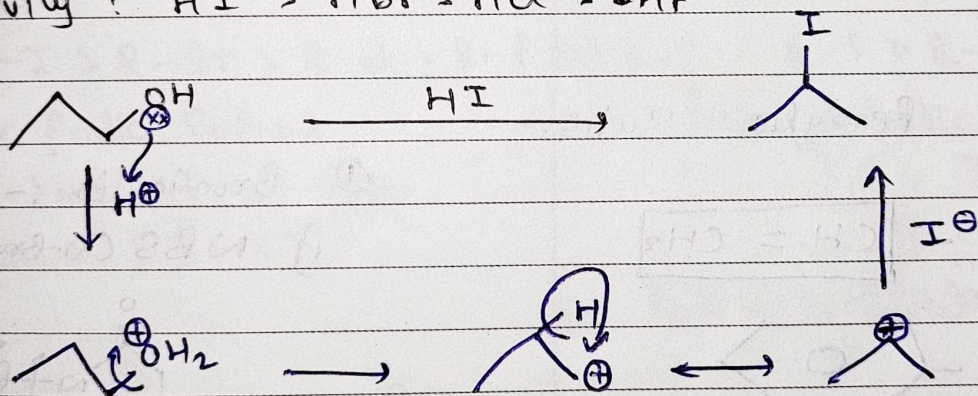
Haloalkanes :-

a) Rxn of Alcohol with HX :-

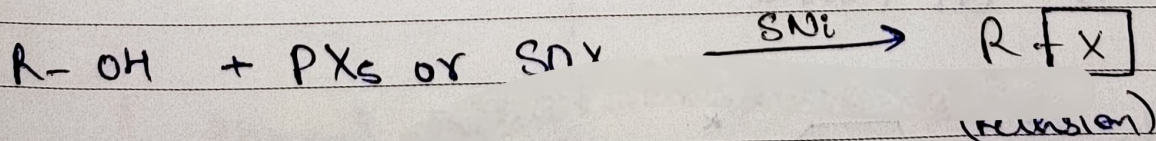
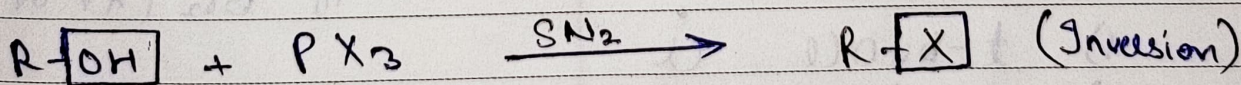


Reactivity :  $HI > HBr > HCl > HF$

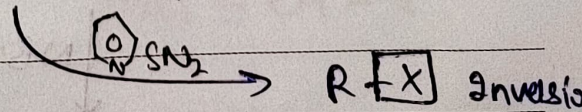
Ex :-



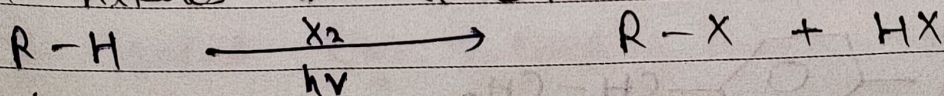
b) Rxn with  $PX_2, PX_3$  &  $SOCl_2$  :-



( $SOCl_2 \rightarrow$  Best method)

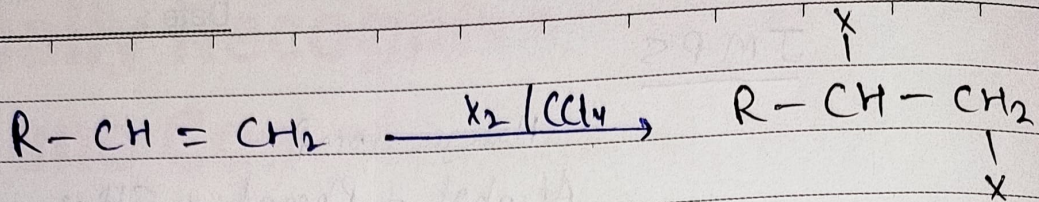


c) Form Alkanes & alkenes :-

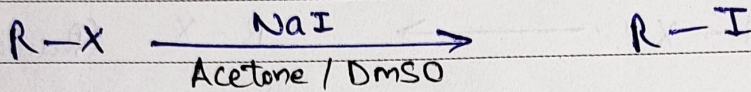


Halogenation

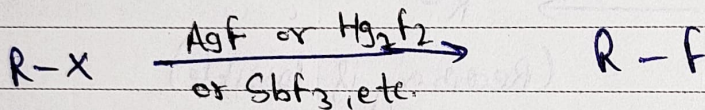
Date: \_\_\_\_\_



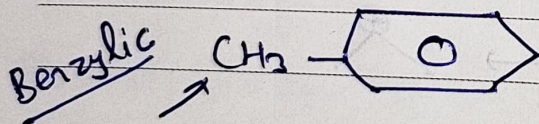
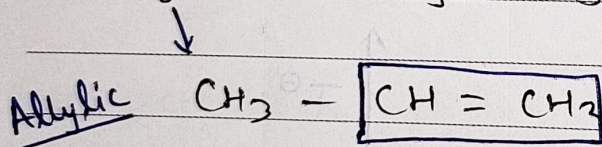
d) Finkelstein Rxn:-



e) Swartz Rxn:-

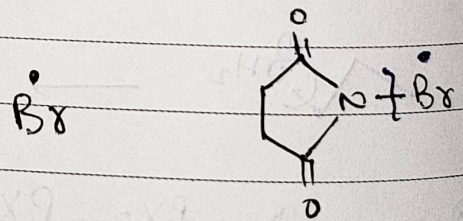


\* Allylic & Benzylic Subs:-



① Bromination:-

i) NBS (N-Bromosuccinimide)

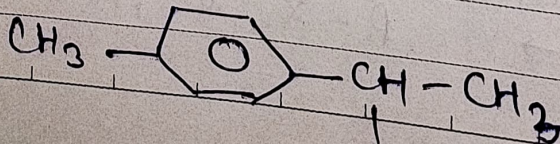
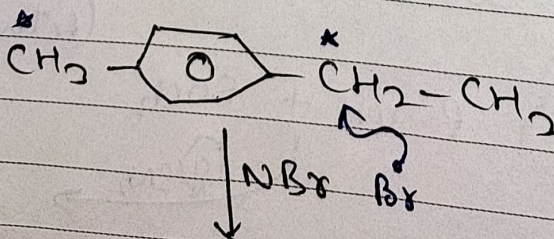


② Chlorination:-

- i)  $t\text{-BuOCl}$   $h\nu$
- ii)  $Cl_2 / 500^\circ C$

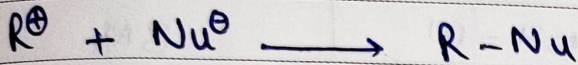
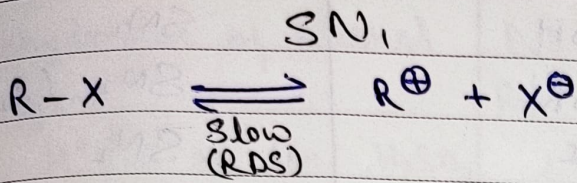
ii)  $Br_2 / h\nu$  or  $low\ Cn$

Ex:-

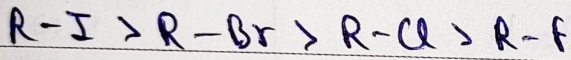


Properties :-

① N.S.R :-



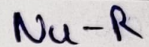
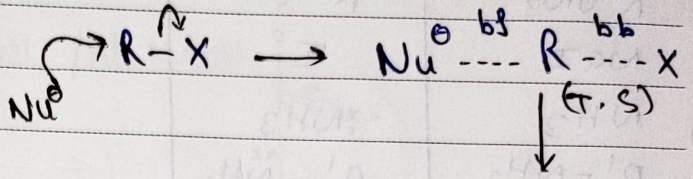
- (i) mech → Carbocation
- (ii) Racemisation
- (iii) RoR ∝ stability of C<sup>⊕</sup>
- (iv) RoR :-



- (v) Polar protic Solvent  
Ex H<sub>2</sub>O, R-OH, etc.

- (vi) Rate ∝ [R-X]<sup>1</sup>

S<sub>N</sub>2



- (i) mech:- Transition stt is formed
- (ii) Inversion
- (iii) RoR ∝             
Steric Hindrance

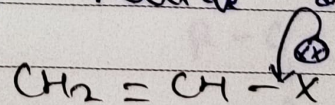
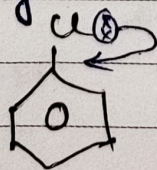
- (iv) RoR :- R-I > R-Br > R-Cl > R-F

- (v) Polar Aprotic Solvent  
Ex;  $\text{>C=O}$ , DMSO  $\text{>S=O}$   
          , H-C-N-Me<sub>2</sub>

- (vi) RoR ∝ [R-X][Nu]<sup>0</sup> D.M. form. A

S<sub>N</sub>2 of

Phenyl Halide, Vinyl Halide and

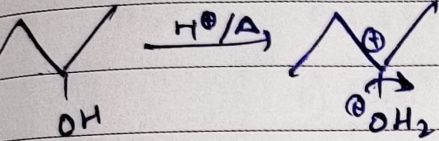
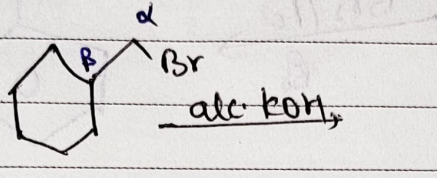
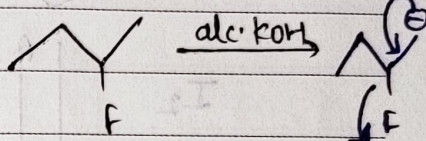
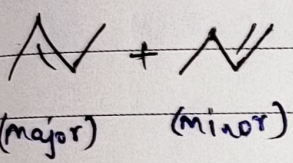
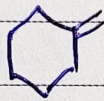
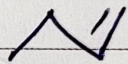


Bridge Headed (acc. to Bredt's Rule) → No occurs



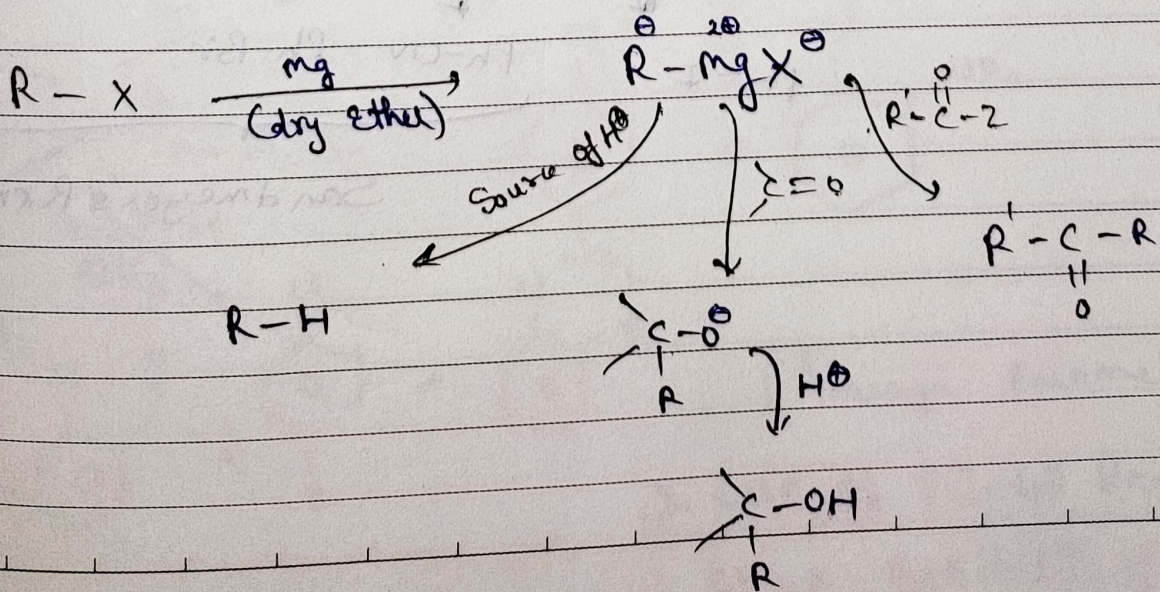


② Elimination:-

$E_1$	$E_2$	$E_1^{CB}$
Dehydration of Alcohol	Dehydro Halogenation	Dehydro Halogenation
Reag:- $H^+ / \Delta$ or Conc. $H_2SO_4$	Reag:- Alc. $KOH$ / Alc $NaOH$	$(X = F)$
Ex:- 	Ex:- 	Ex:- 
 (major) (minor)	 (Anti-elimination) $(X = Cl, Br, I)$	
Intermediate: Carbocation $(C^+)$	Transition State	Carbanion
more Stable Alkene (major)	more Stable alkene (major)	more Stable Carbanion will decide (major)

③ Rxn with metals:-

① a.r formation:-

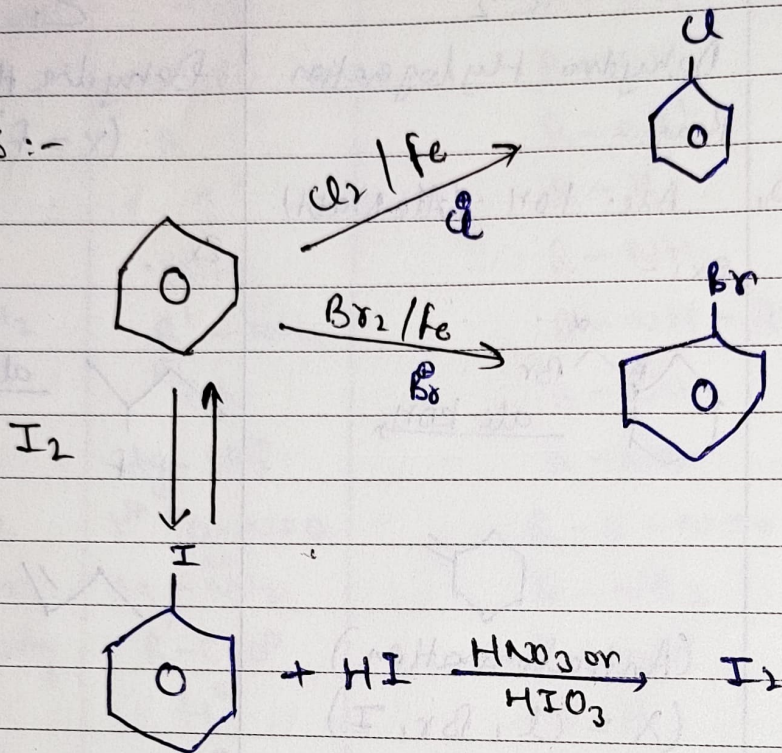


Date : \_\_\_\_\_

Haloarenes :-

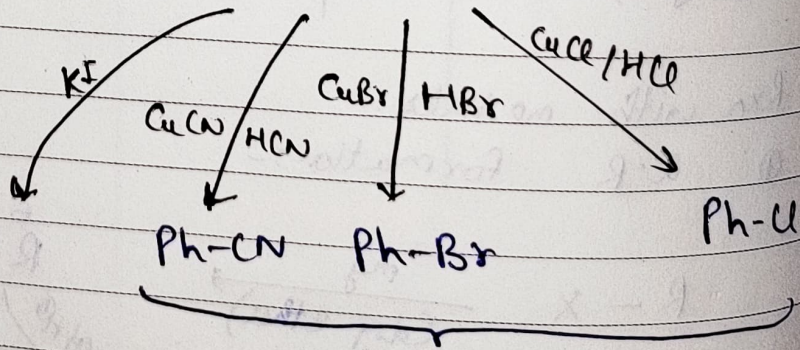
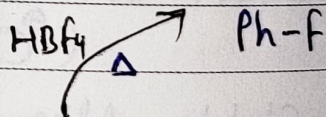
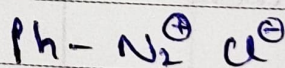
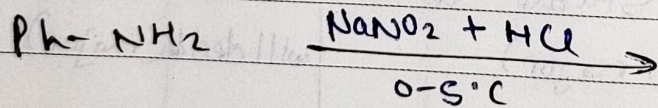
map :-

① EAS :-



Baltz Schiem  
Rxn

② Sandmeyer's Rxn:-



Sandmeyer's Rxn

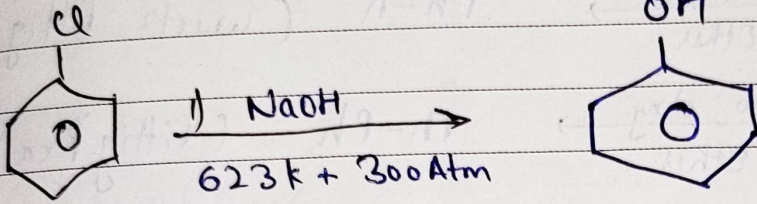
Properties:-

① NAS:-

Normal Haloarenes  
do not show NAS.

a) Dow's Process:-

Due to partial  
Double Bond Ch.

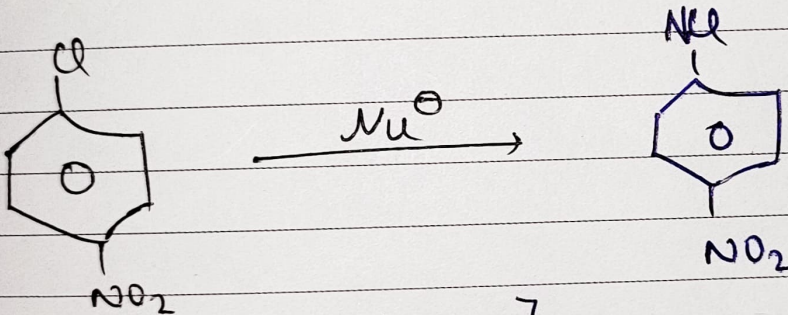


ii)  $H_3O^+$

b) Nitrochlorobenzene :- ( $ArSN_2$ )

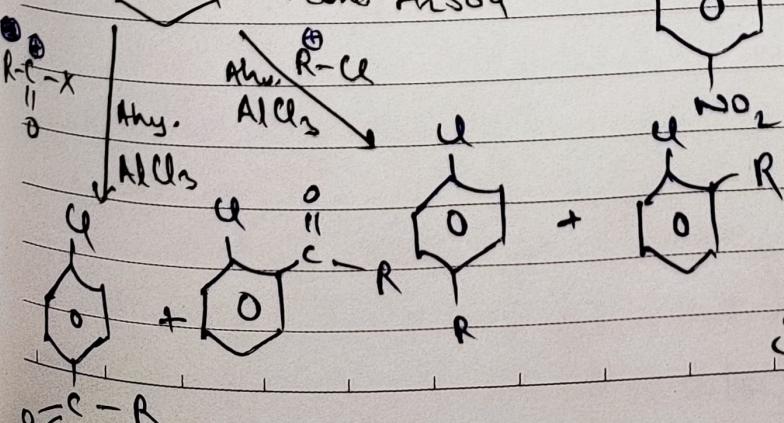
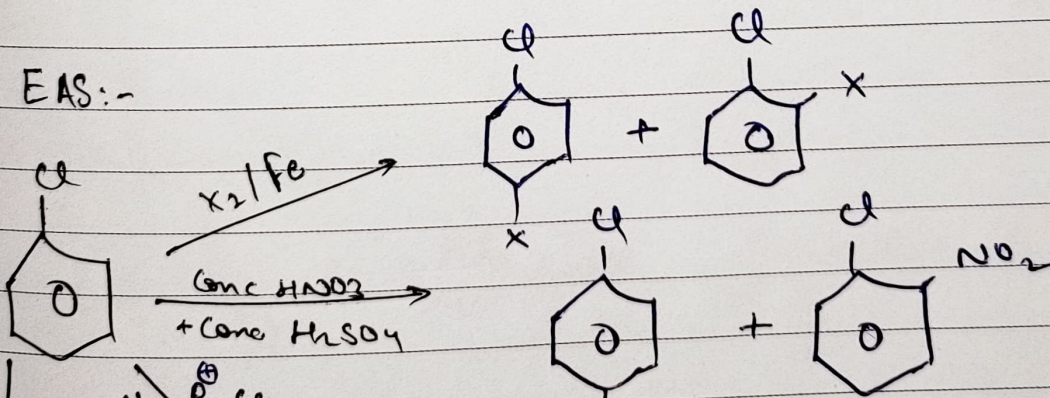
ROP:-

$Ar-F > Ar-Cl > Ar-Br$   
 $> Ar-I$



[o and p Nitro chlorobenzene]

② EAS:-



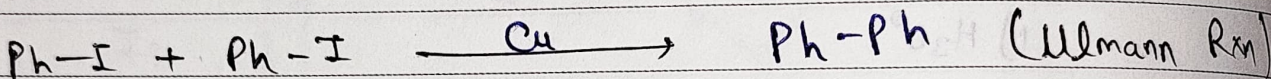
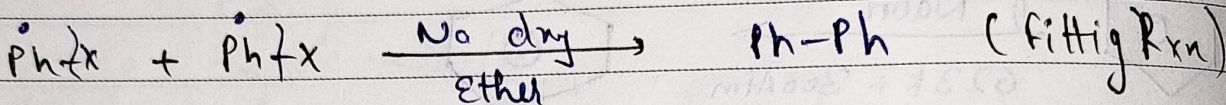
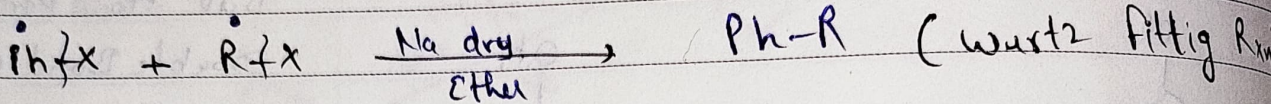
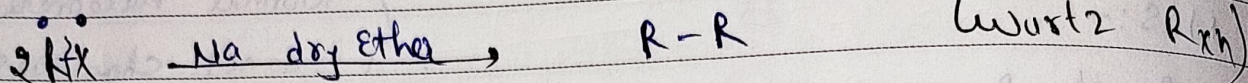
(Always para major)

In case of Friedel Crafts,

check possibility of Rear.

Date :

③ Rxn with metals:-

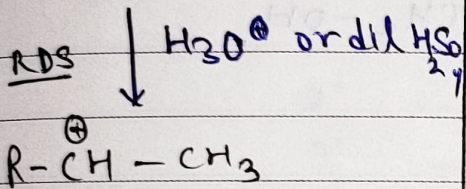
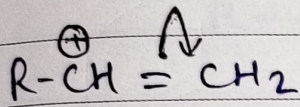


Alcohols:-

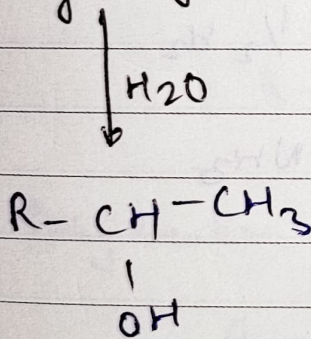
MOP :-

① from alkenes:-

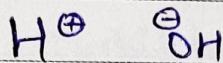
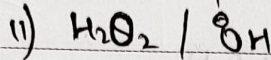
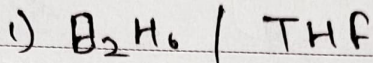
a) Hydration:-



(Rearrange if possible)

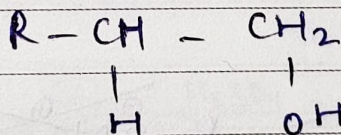
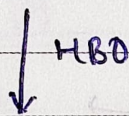
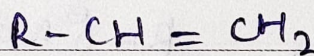


b) H.B.O

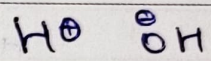
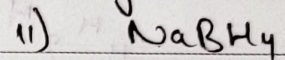
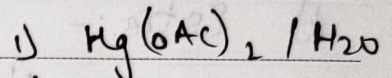


(Antimar)

(Syn Add.)

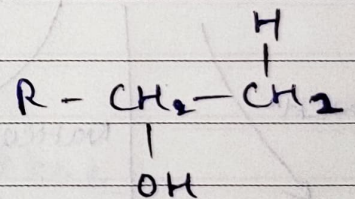
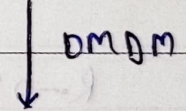
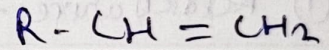
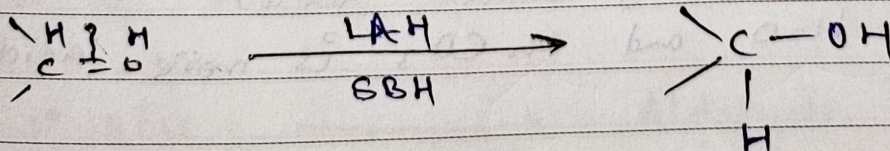


c) OMDM

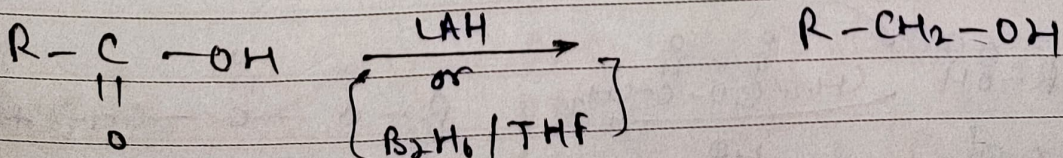


(Mar.)

(Anti Add.)

② Red<sup>n</sup> Rxn:-a) from Carbonyl Red<sup>n</sup>:-

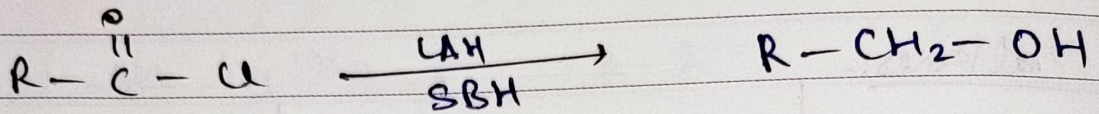
b) from Acid :-



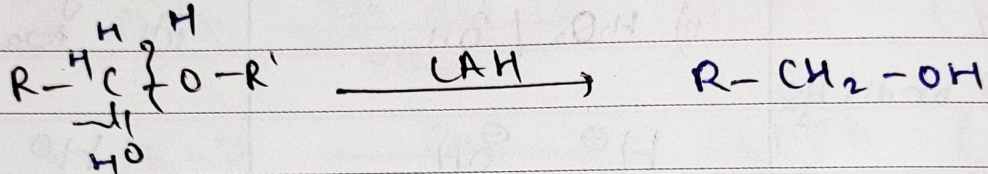
(syn Carbonylic acid)

Date: \_\_\_\_\_

c) From Acid Chloride:-

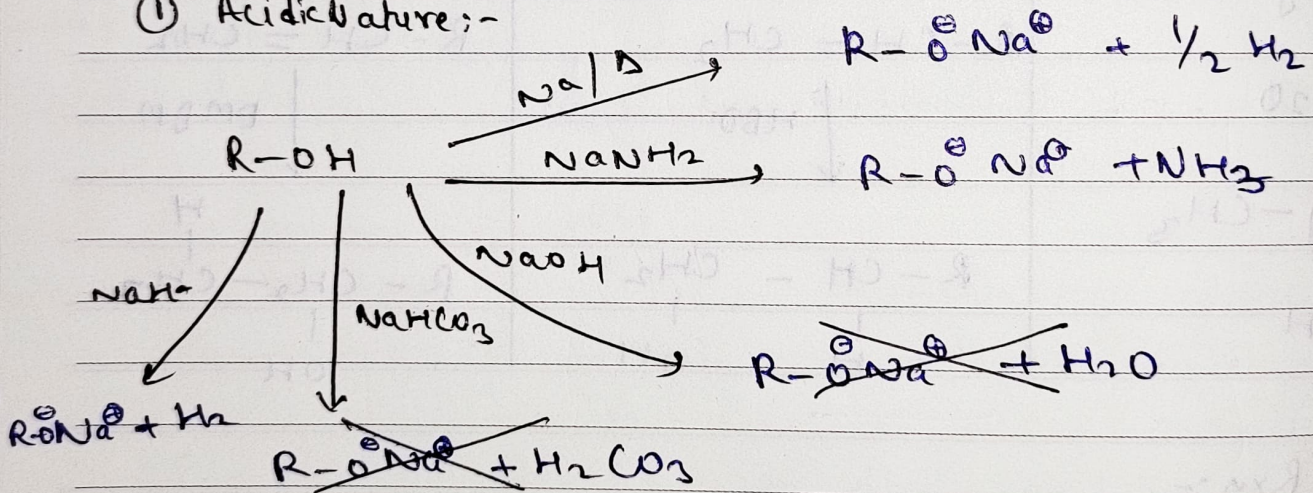


d) Estre :-



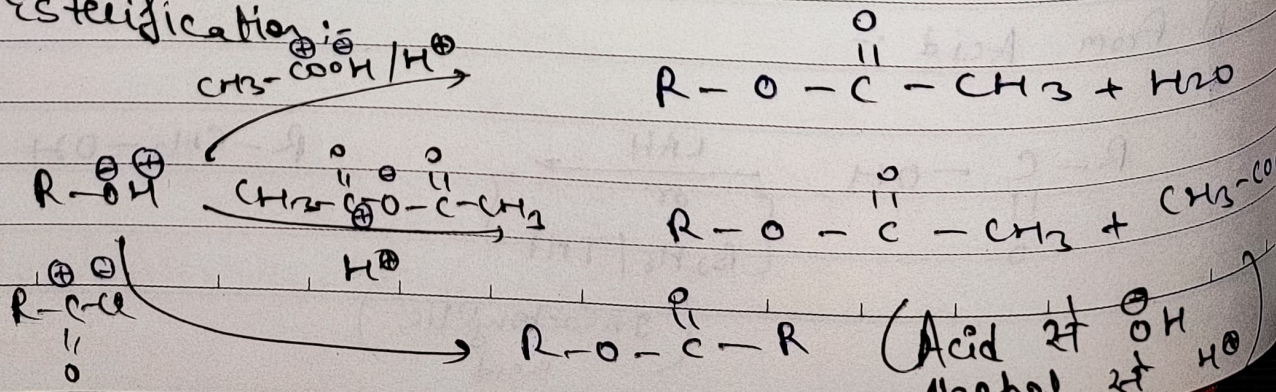
Properties :-

① Acidic Nature :-



Rxn will proceed in the formation of weaker acid. as  $H_2O$  and  $H_2CO_3$  is more acidic than  $R-OH$ .

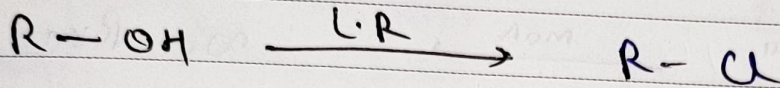
② Esterification :-



③ Lucas test :-

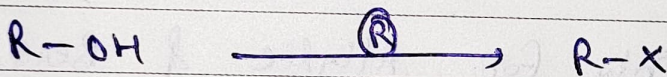
for diff. btw 1° 2° 3° ROH

Lucas reagent :- Conc. HCl / Anhy. ZnCl<sub>2</sub>

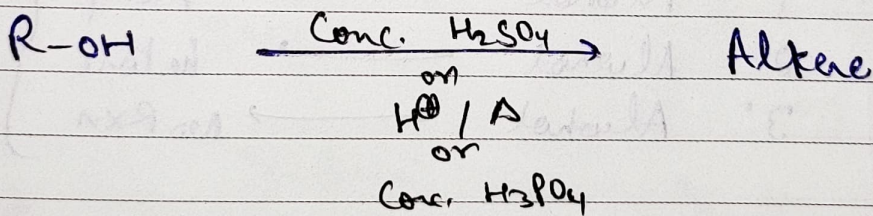


- 1°  $\longrightarrow$  No Turbidity
- 2°  $\longrightarrow$  Turbidity in min's
- 3°  $\longrightarrow$  Turbidity in sec's

④ Rxn with PX<sub>3</sub>, PX<sub>5</sub>, SOX<sub>2</sub>, Red P / X<sub>2</sub> (X=Br, I)



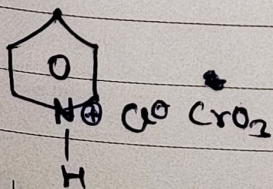
⑤ Dehydration of Alcohol :-



⑥ Oxidation of Alcohol :-

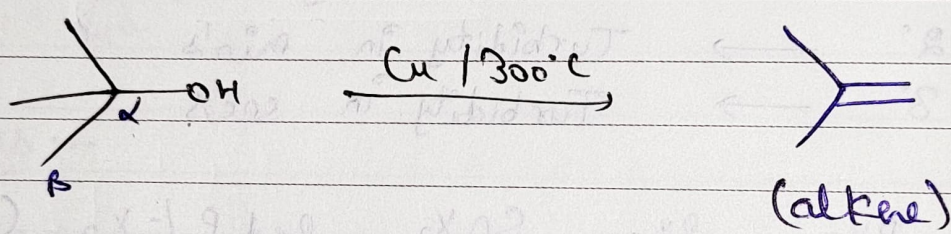
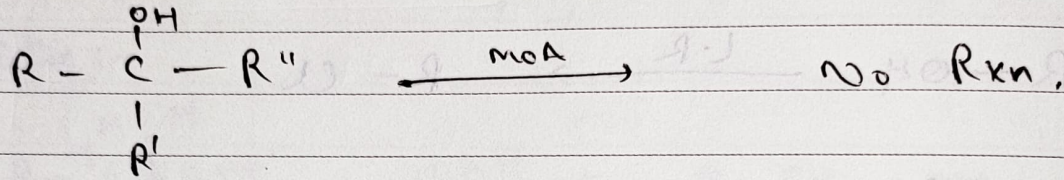
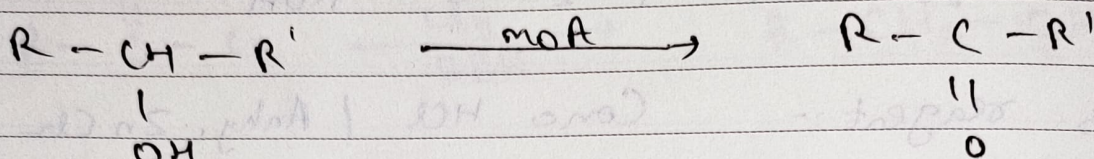
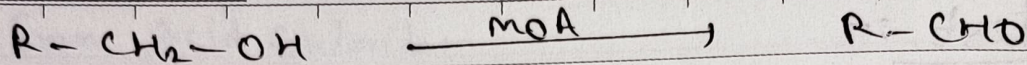
Cu / 300°  $\rightarrow$  3°  $\rightarrow$  Alkene

- |        |                   |          |                        |
|--------|-------------------|----------|------------------------|
| 1° ROH | $\longrightarrow$ | Aldehyde | } Mild oxidizing Agent |
| 2° ROH | $\longrightarrow$ | ketone   |                        |
| 3° ROH | $\longrightarrow$ | NO Rxn   |                        |



- i) PCC  $\left( \text{CrO}_2\text{Cl}_2 \right)$
- ii) PDC  $\left( \text{CrO}_2\text{Cl}_2 \right)$
- iii) Collins's reagent  $(\text{CrO}_5 \cdot 2\text{H}_2\text{O})$
- iv) Jones's reagent  $(\text{CrO}_3 + \text{acetic acid})$
- v) Cu or Ag / 300°

Date : \_\_\_\_\_



#  $MnO_2$  (Only for Allylic & Benzylic <sup>alcohol</sup> Oxidation)

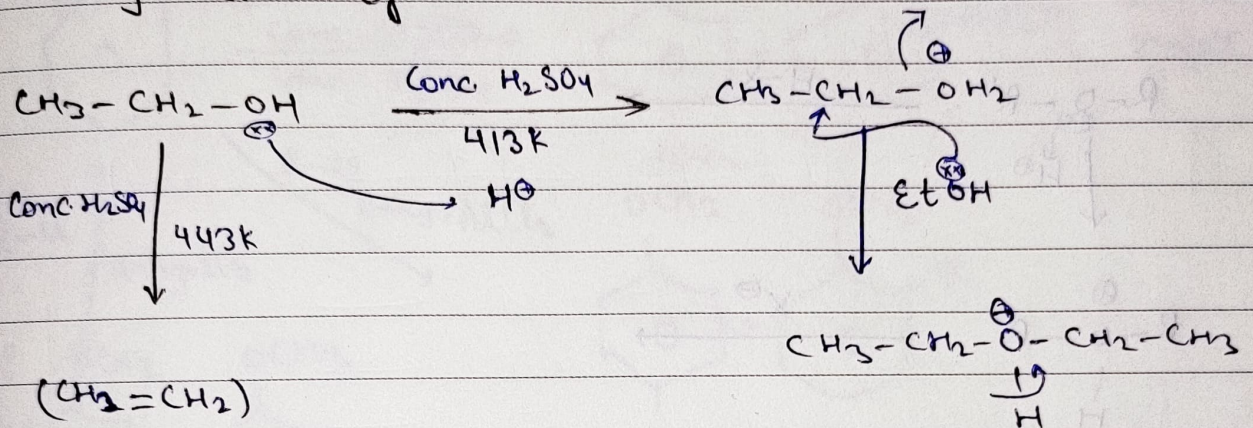
1° Alcohol	→	Acid	} Strong Oxidizing Agent
2° Alcohol	→	ketone	
3° Alcohol	→	No Rxn	

- 1) Acd.  $KMnO_4 / H^+$
- 2)  $K_2Cr_2O_7 / H^+$
- 3)  $HNO_3$  (conc)
- 4) Jones's ~~Reagent~~ Reagent ( $CrH_2SO_4$ )

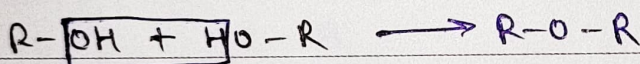
Ethers:-

MOP:-

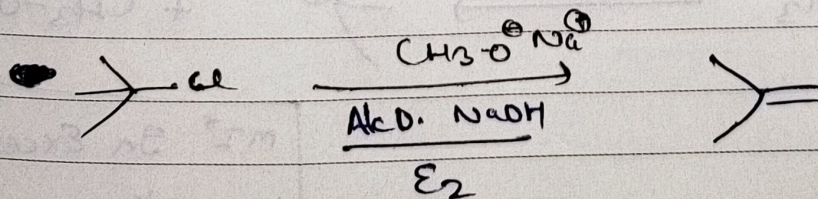
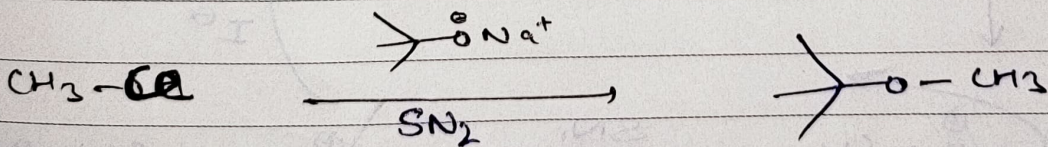
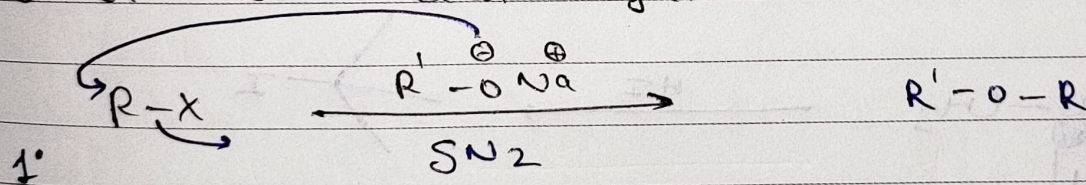
① Dehydration of Alcohols:-



DM:-



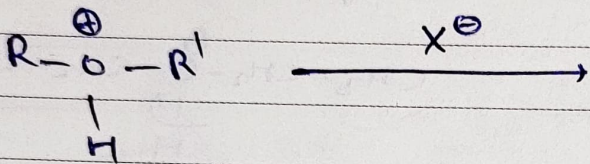
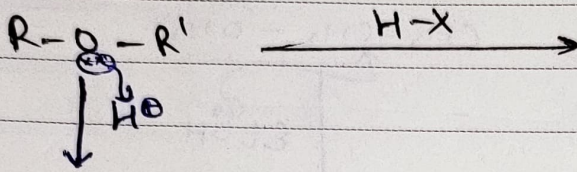
② Williamson Ether Synthesis:-



Date: \_\_\_\_\_

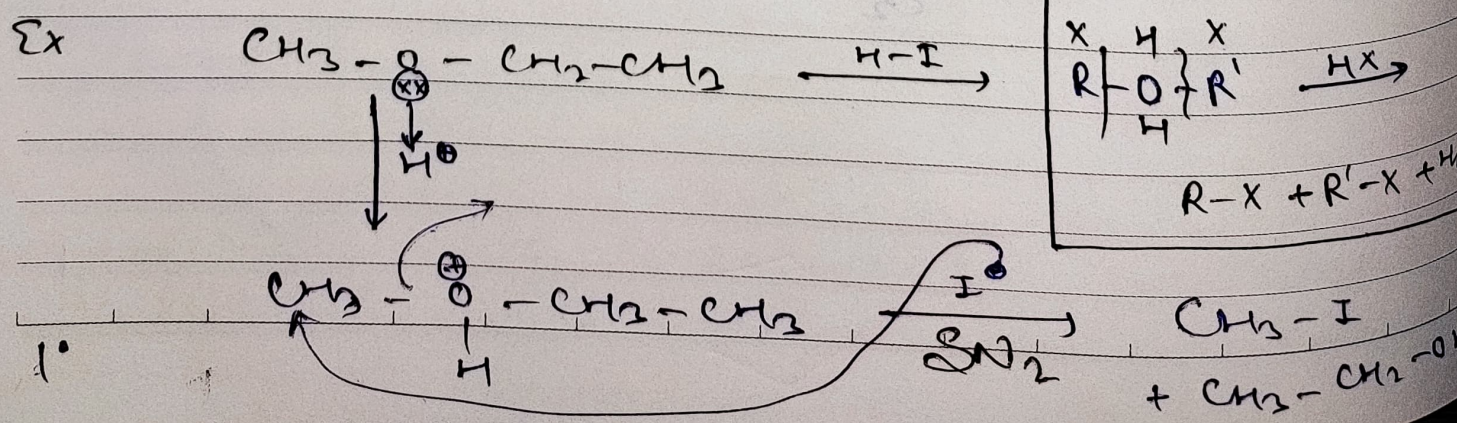
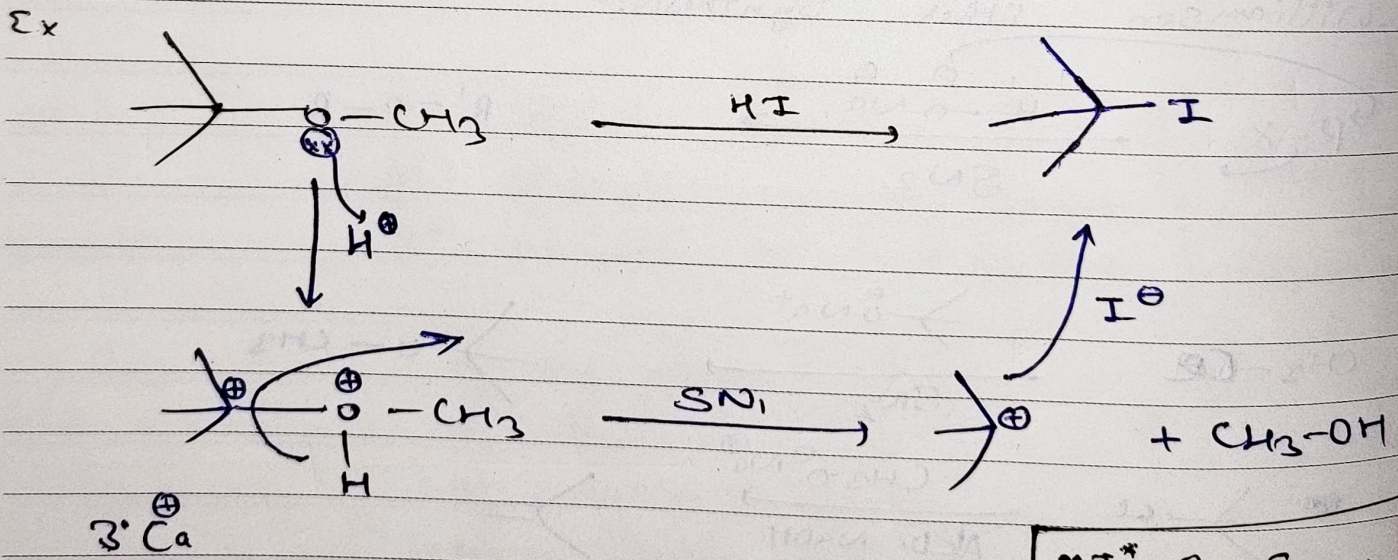
Properties:-

① Rxn with H-X

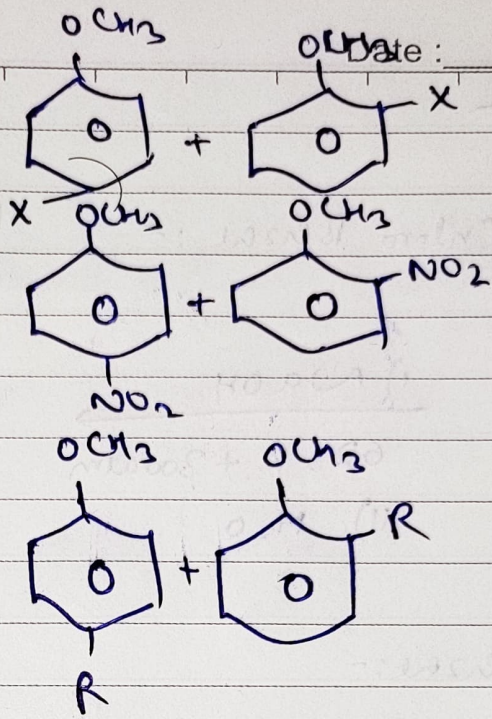
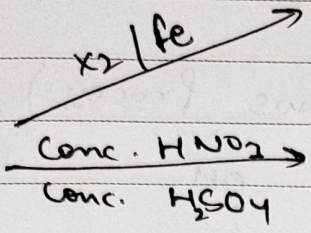
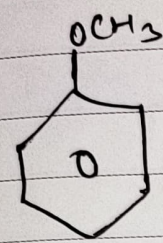


SN1  
 # of R, R'  $\xrightarrow{\text{Anyone}}$  3°, Resonance stabilized 1°, 2° C<sup>⊕</sup>

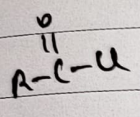
# other wise SN2. Normal 1°, 2° (Both R, R')



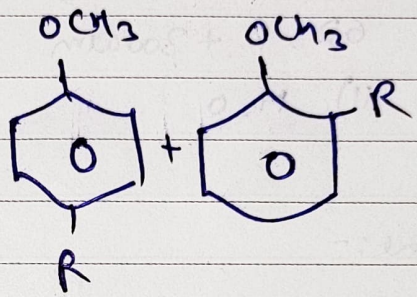
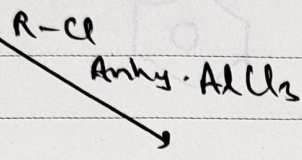
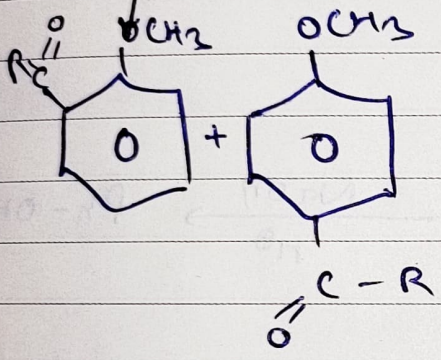
② EAS:-



always Para major



AnhydAlCl3

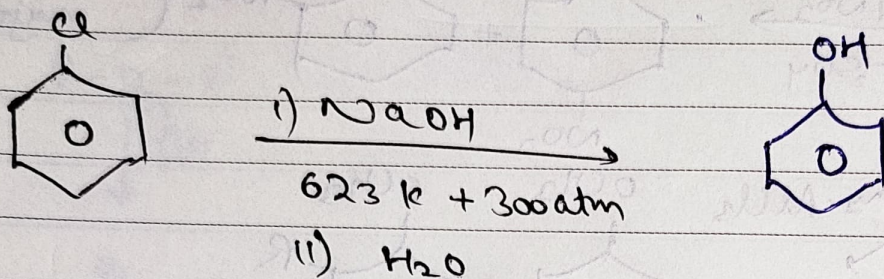


Date: \_\_\_\_\_

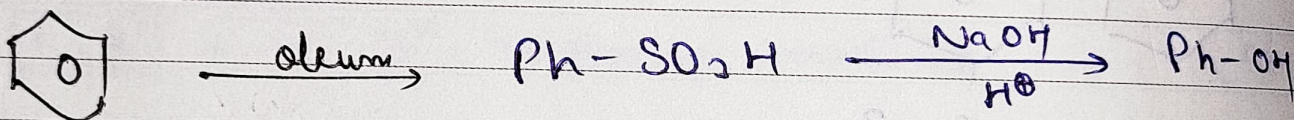
Phenols :-

MOF :-

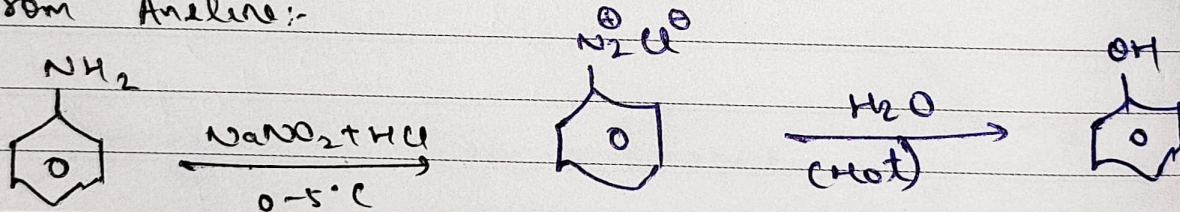
① from Chloro Benzene :- (Dows Process)



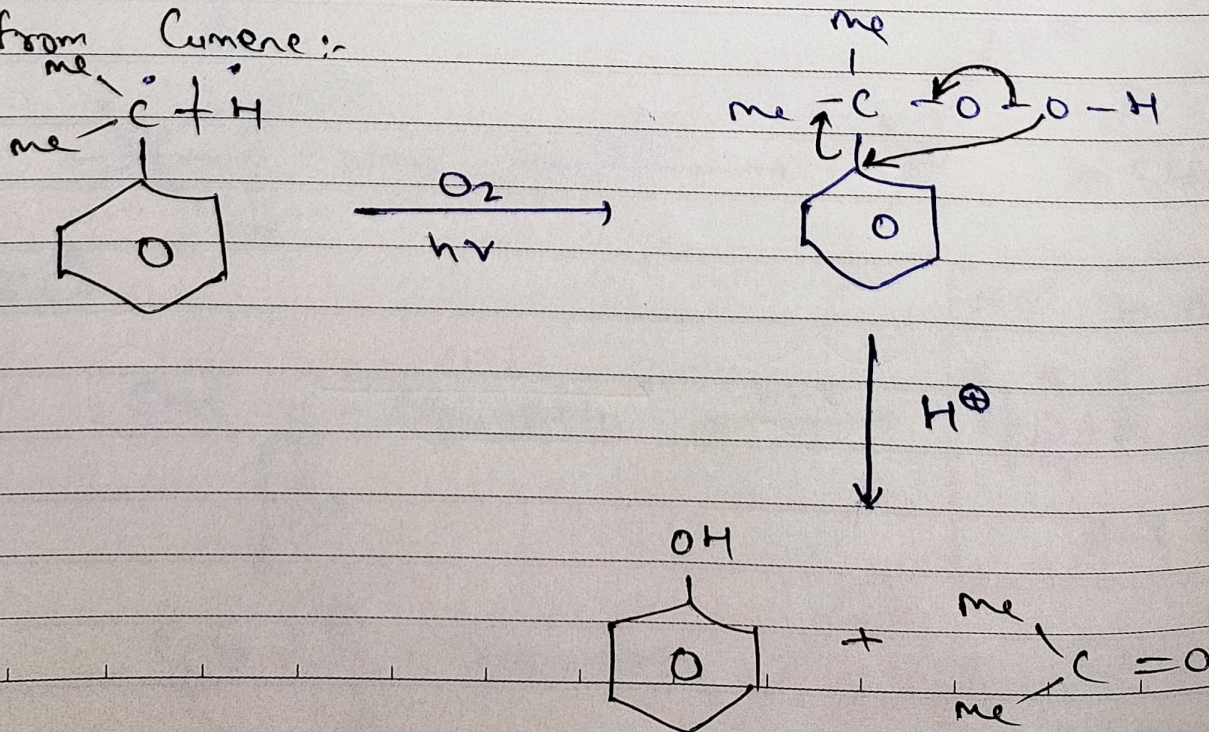
② from Benzene :-



③ from Aniline :-

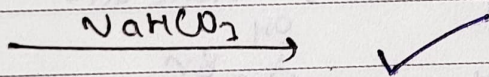
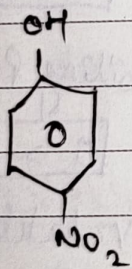
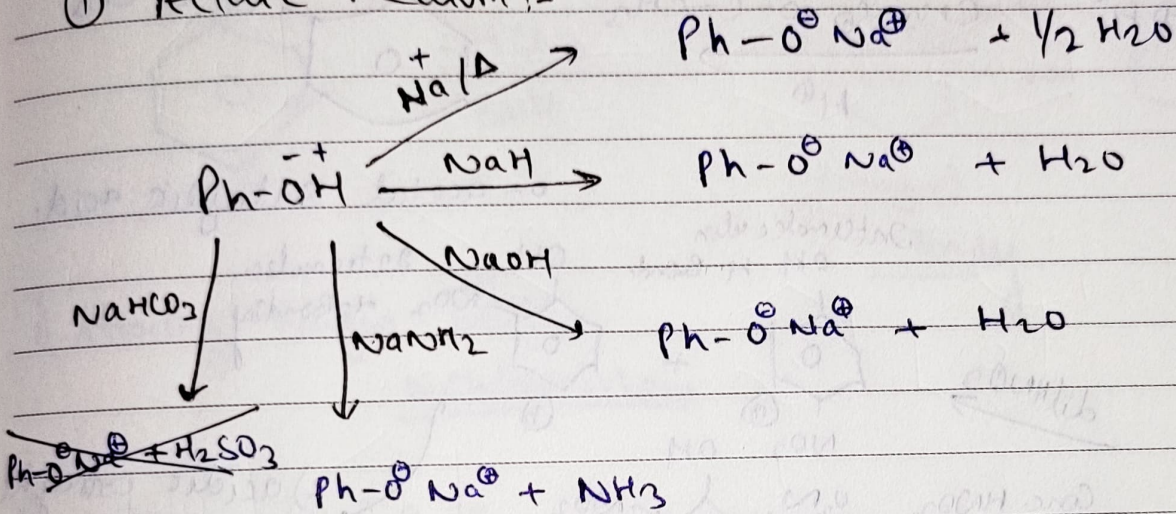


④ from Cumene :-



Properties:-

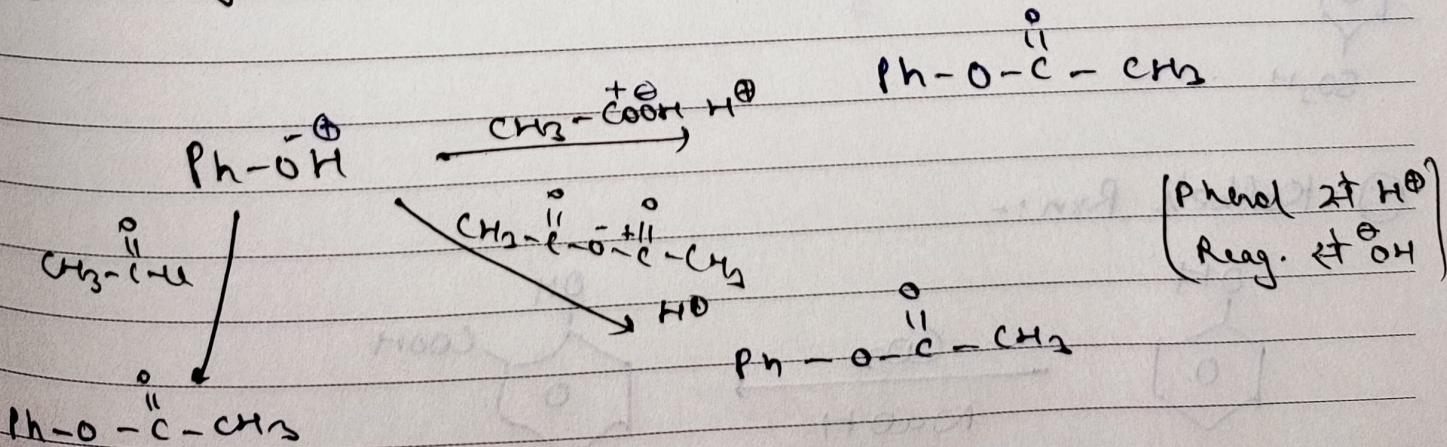
① Acidic medium:-



all Dinitro & trinitro

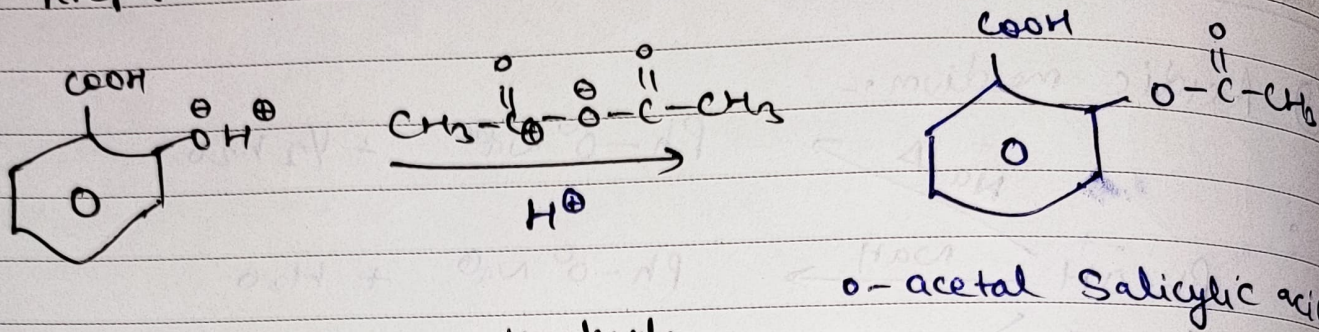
(mono-nitro phenol)

② Esterification:-

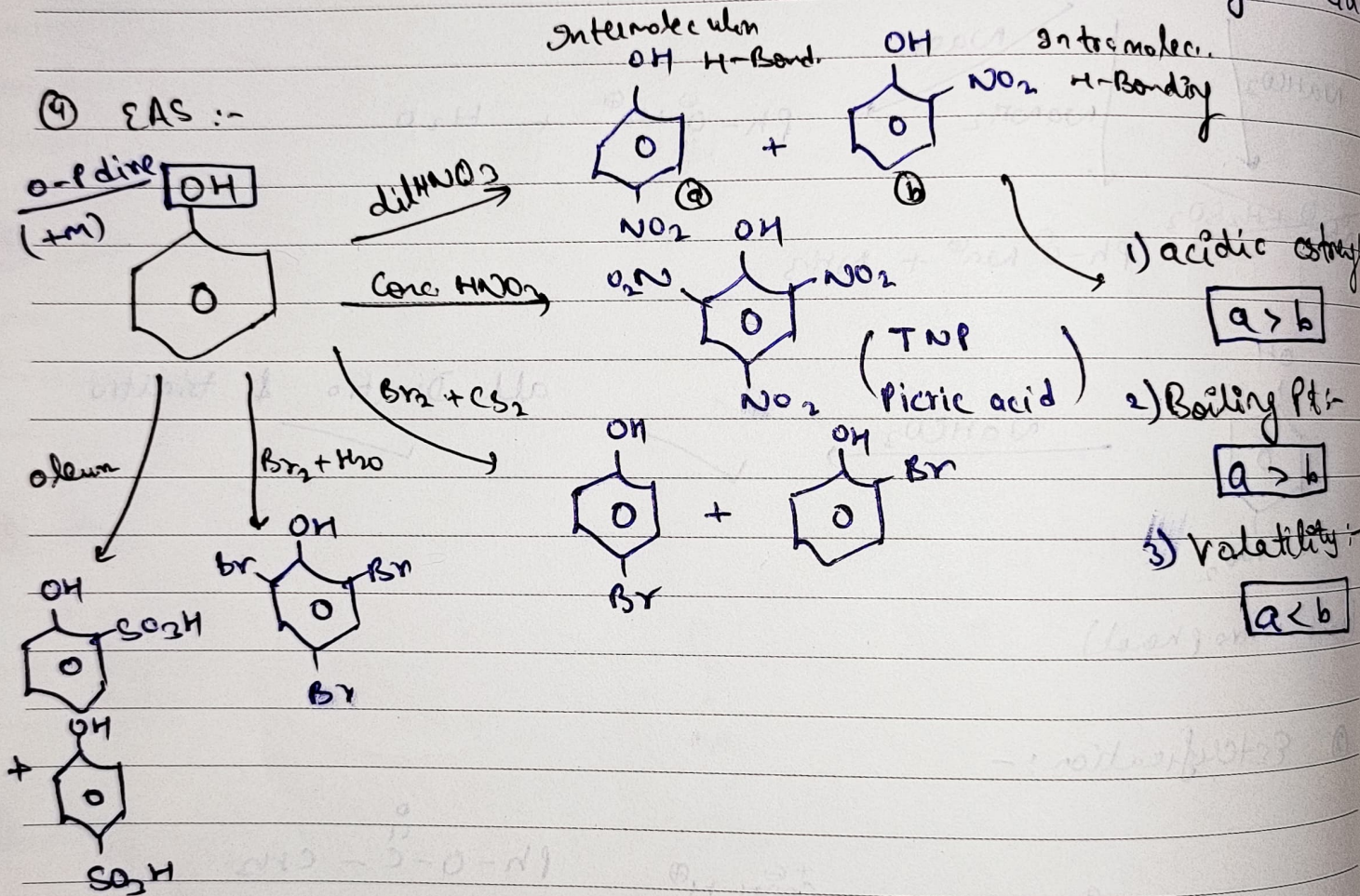


Date: \_\_\_\_\_

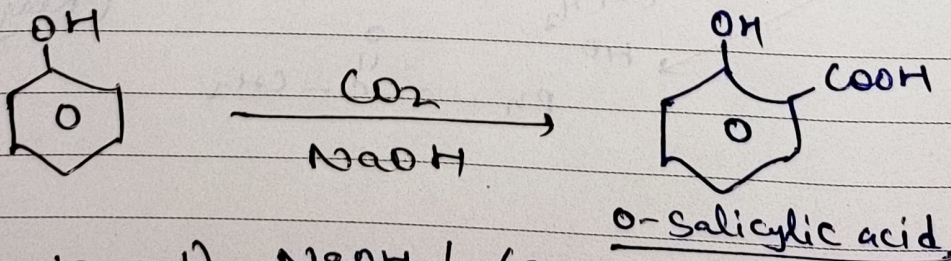
③ Arspoin formation :-



④ EAS :-

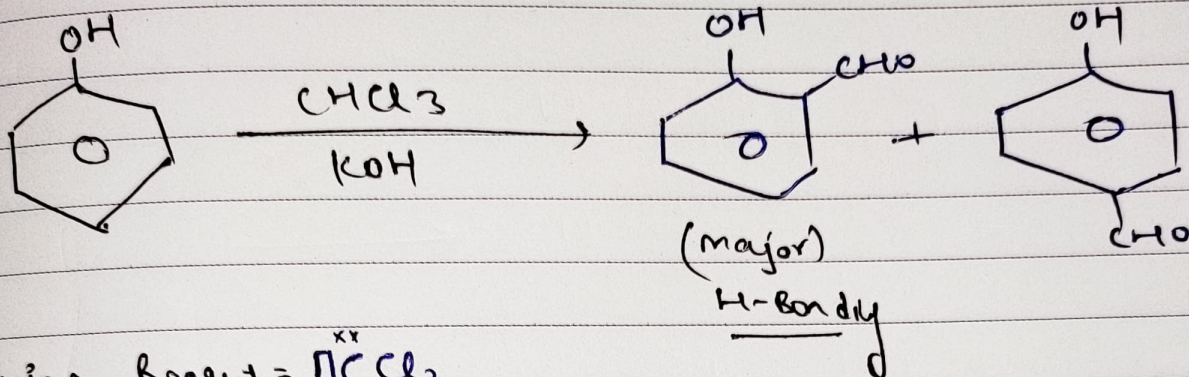


⑤ Kolbe's Rxn :-



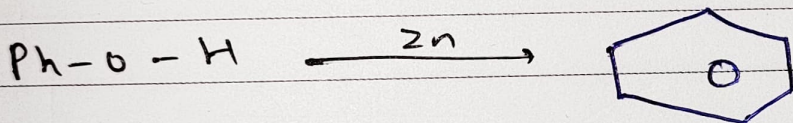
Reagent :- 1) NaOH / CO<sub>2</sub>  
 (i) H<sup>+</sup>

## ⑥ Reimer-Tiemann Rxn:-



1) Attacking Reagent =  $\overset{\text{xx}}{\text{C}}\text{Cl}_2$   
Dichlorocarbene

## ⑥ Rxn with Zn :-



## ⑦ Oxidation:-

