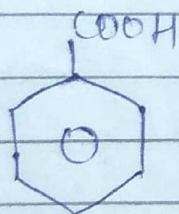
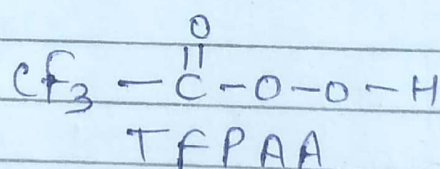
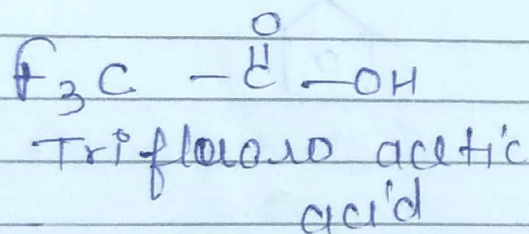
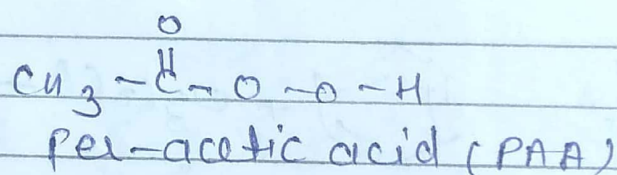
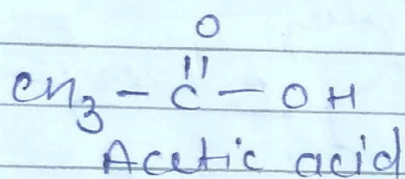
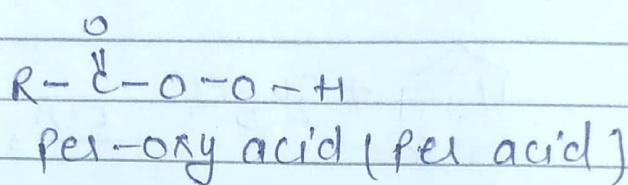
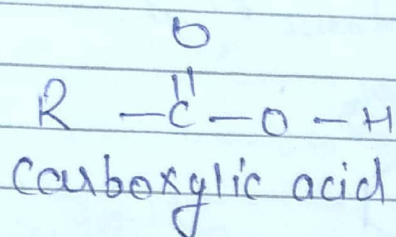


SBG STUDY

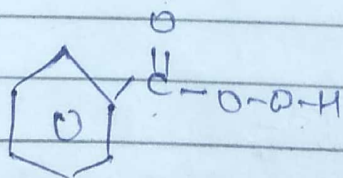
Oxidation

Aldehyde & Ketone

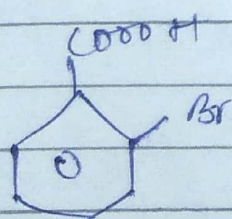
(1) By Per-acid or Per-oxo acid or Baeyer villiger
oxidation:



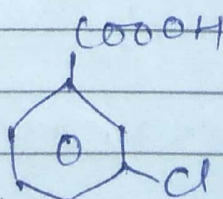
BA



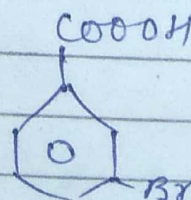
PBA



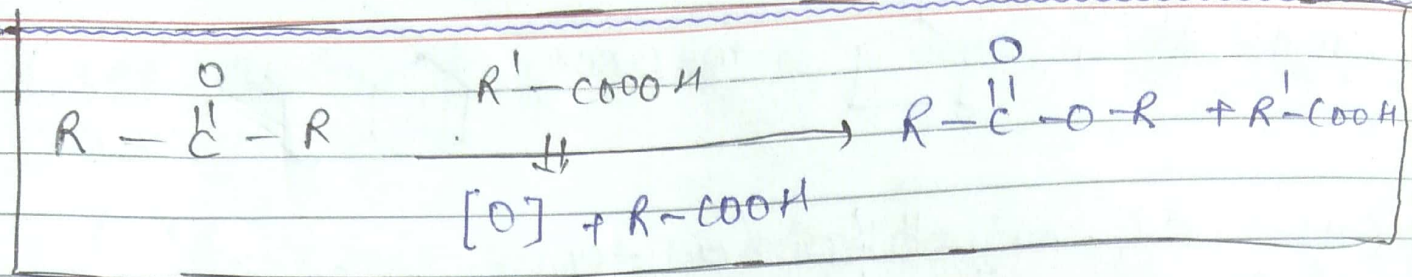
o-BPBA



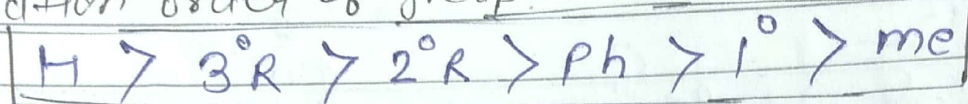
m-CPBA



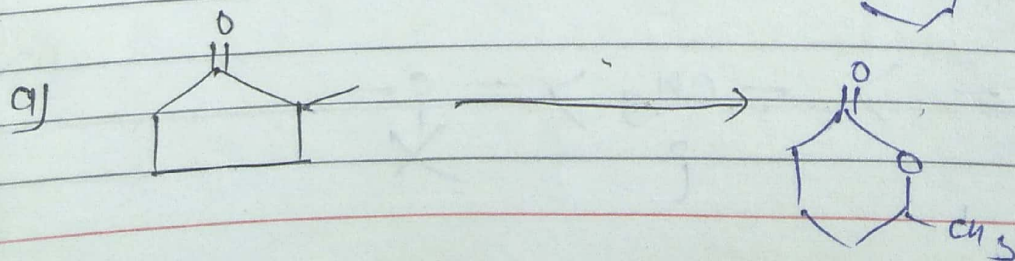
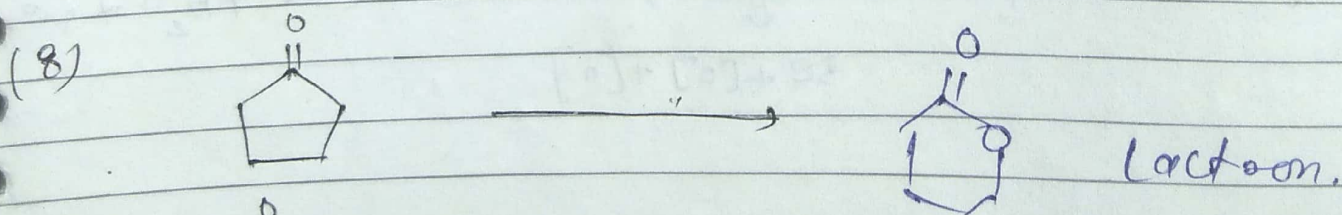
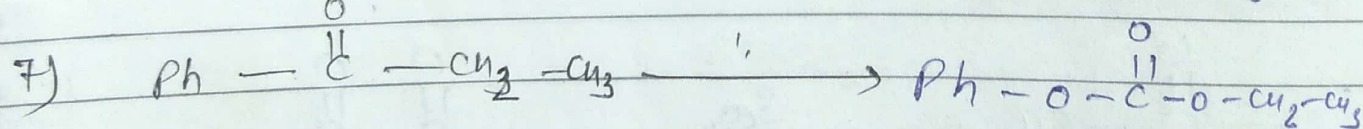
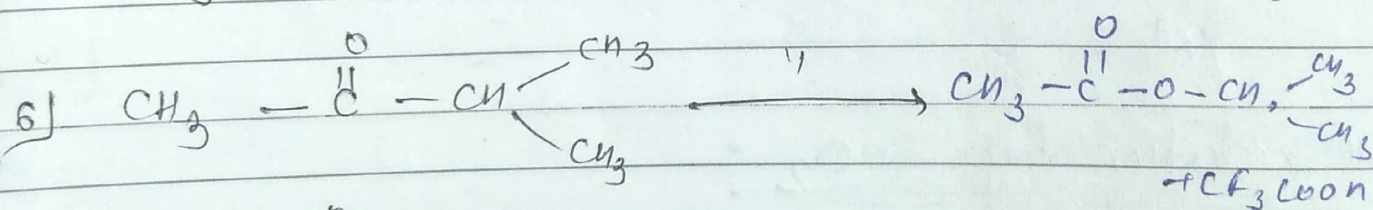
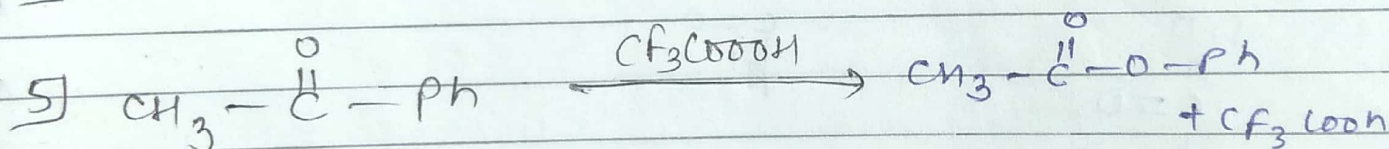
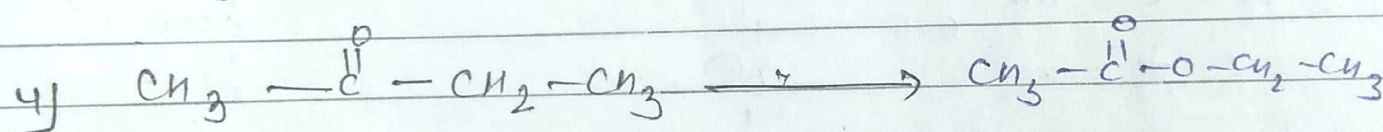
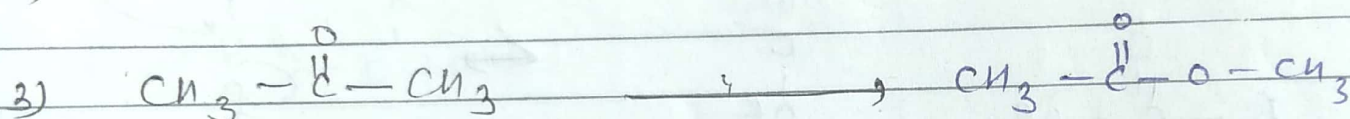
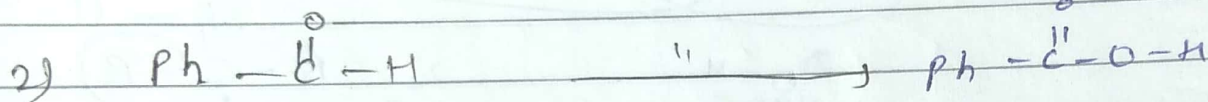
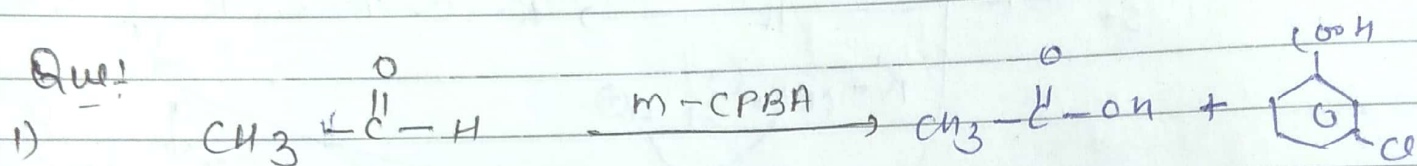
m-BPBA

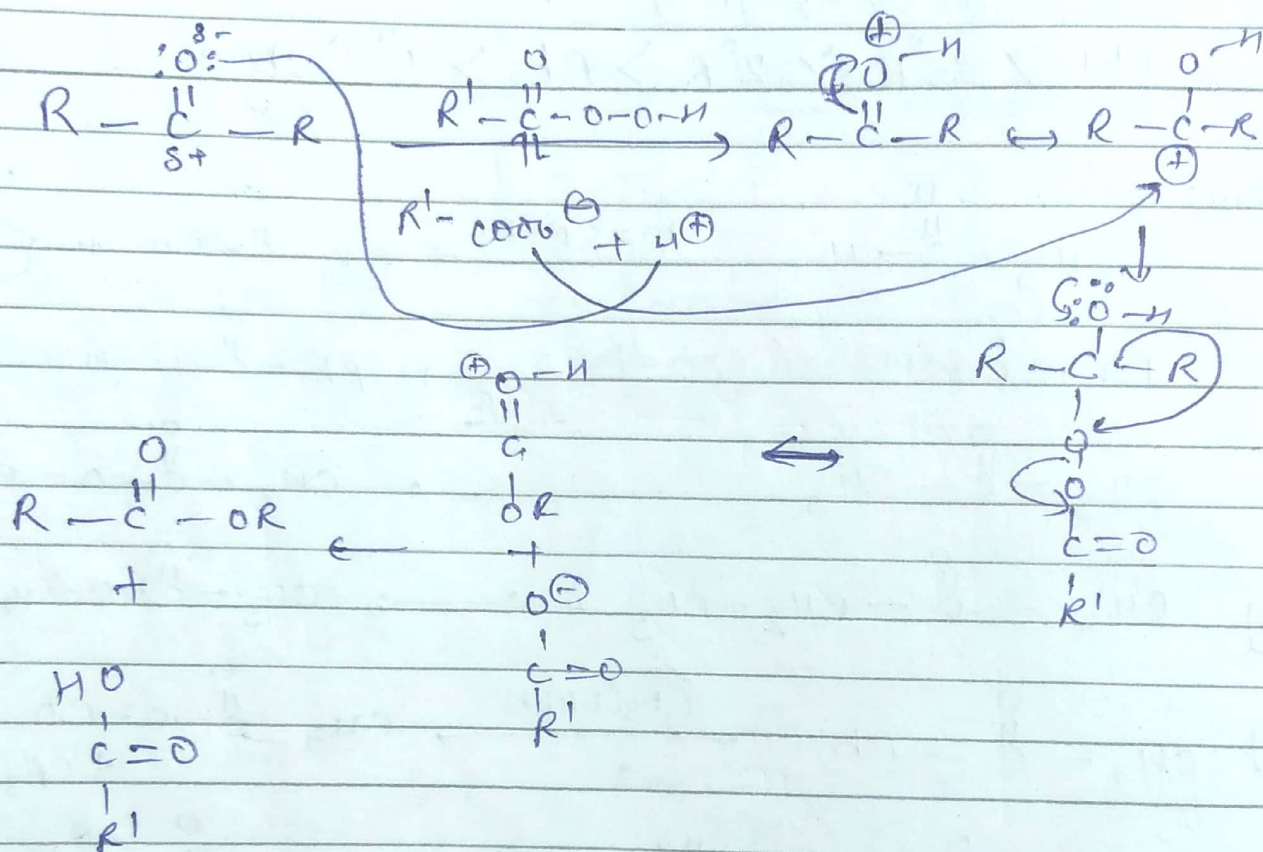
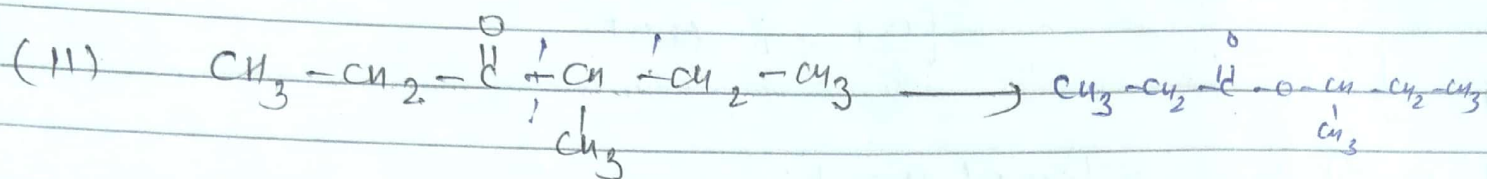
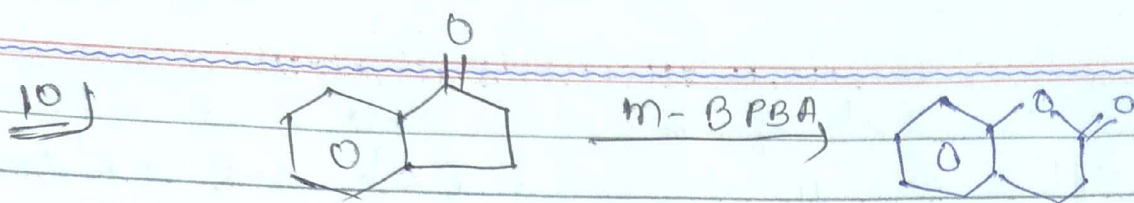


Oxidation order of group:

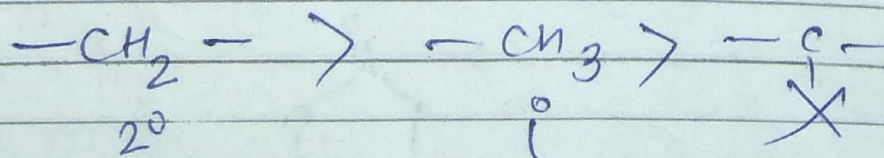
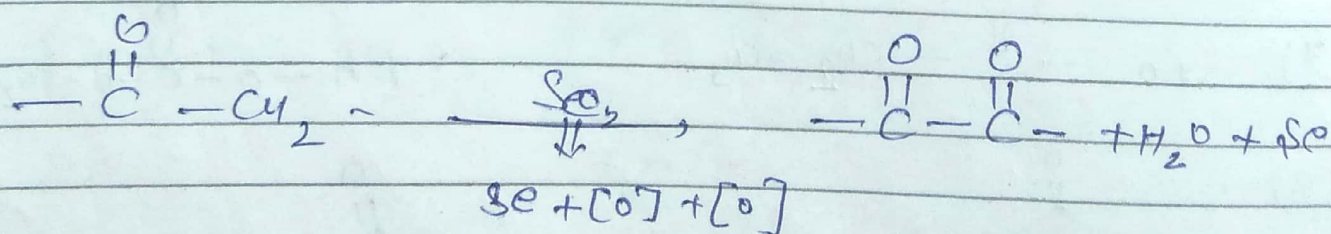


Que:





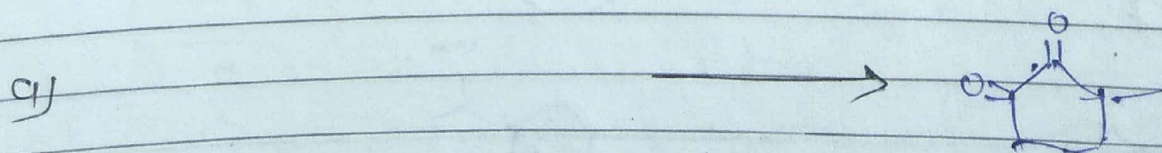
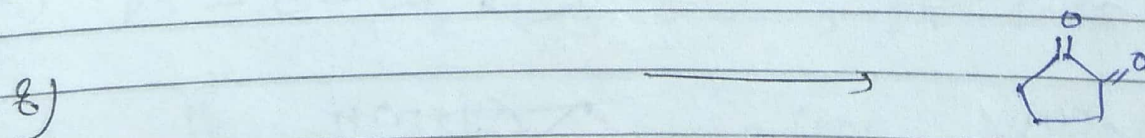
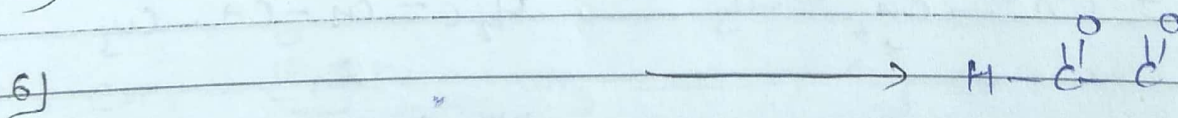
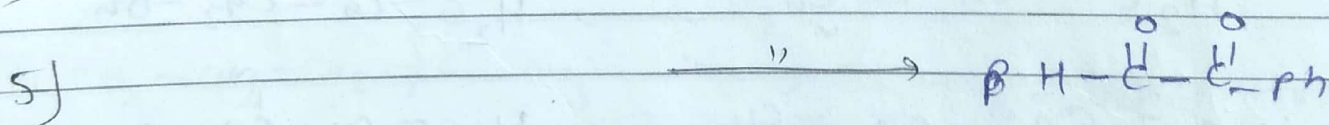
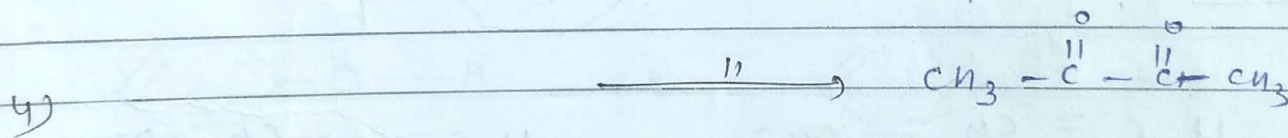
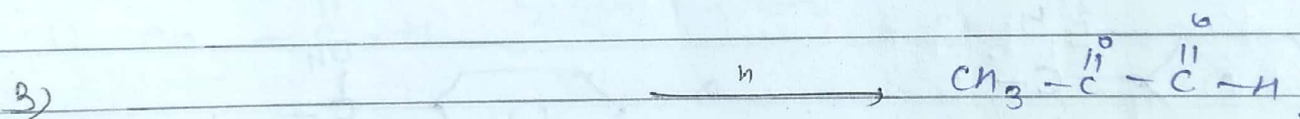
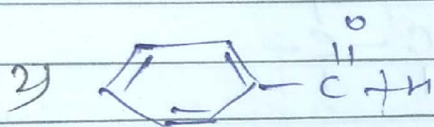
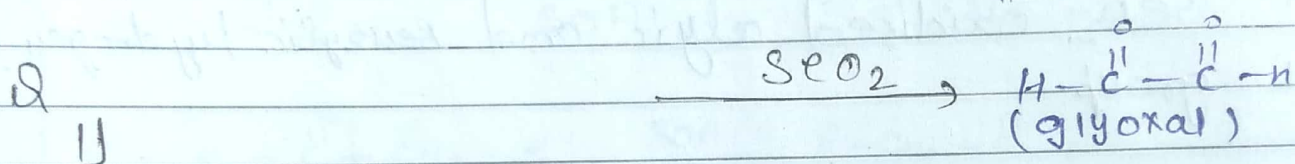
* Oxidation by SeO_2 :



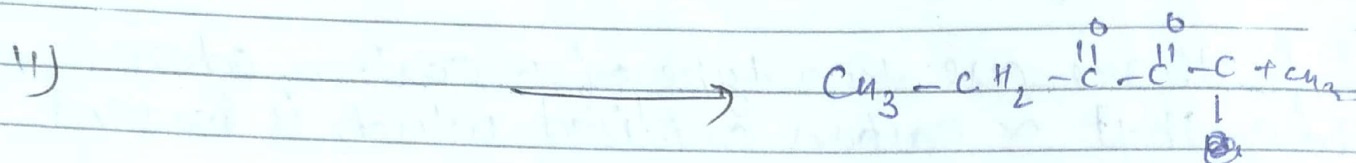
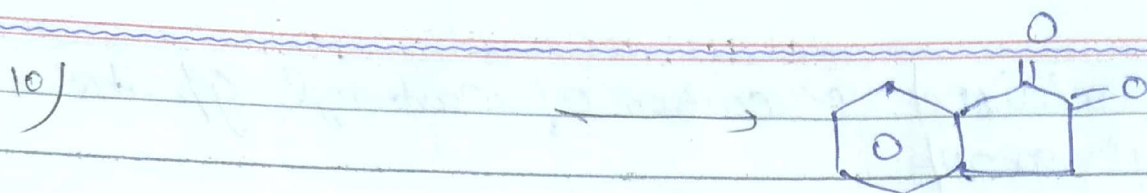
* SeO_2 oxidised α carbon of carbenyl gp to carbonyl group.

* If there are two type of α carbon atom then that α carbon oxidised which is present in long chain.

* 3° α Carbon never oxidised. ~~$\text{H}-\text{C}-\text{H}$~~

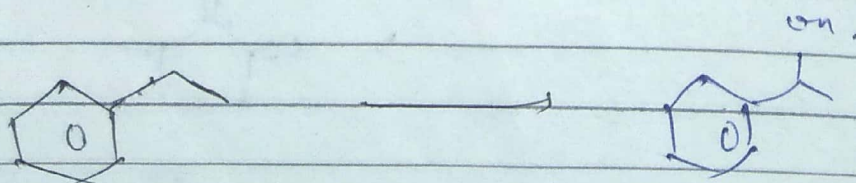
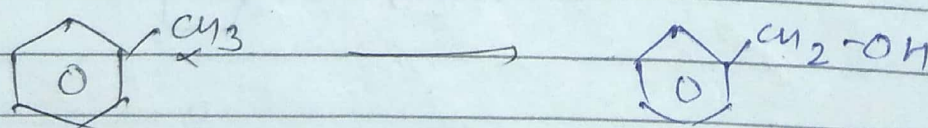
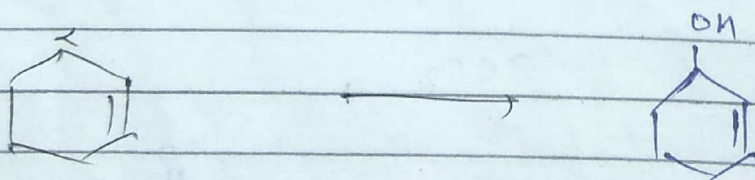
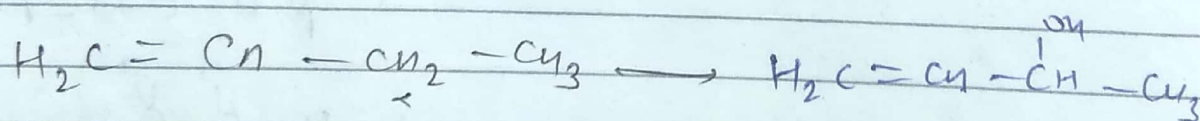
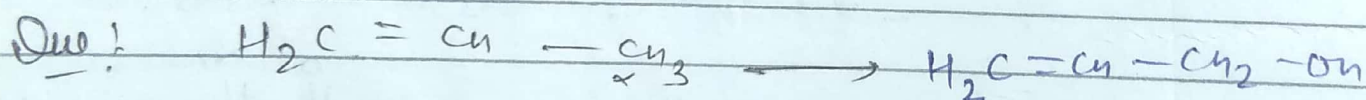
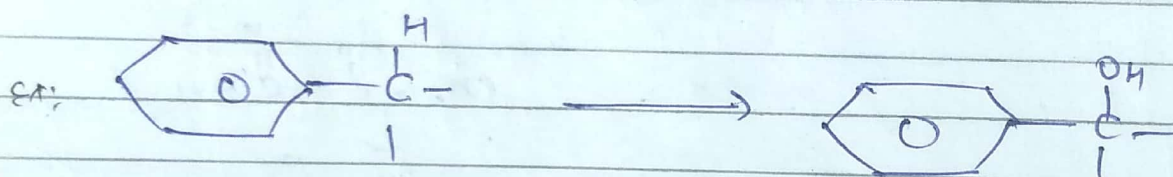
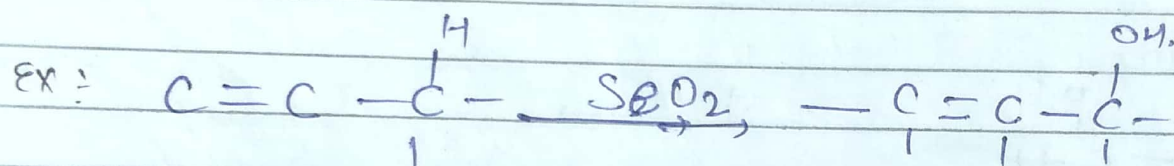


Note:-

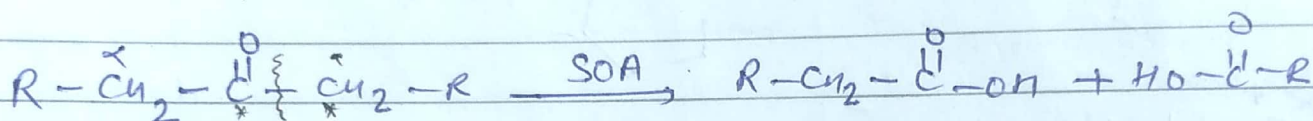
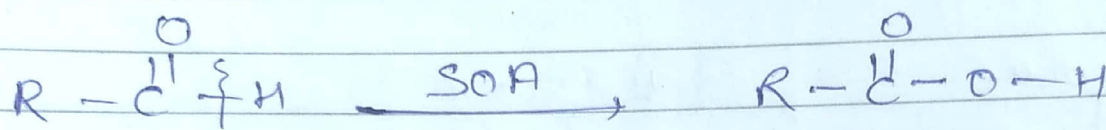
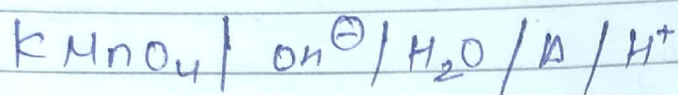
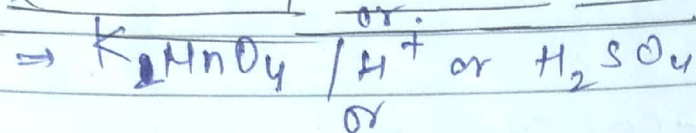
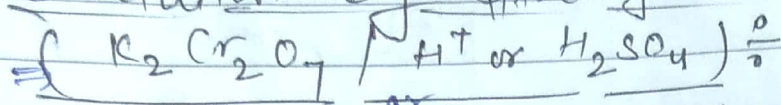


* Oxidation by $K_2Cr_2O_7$

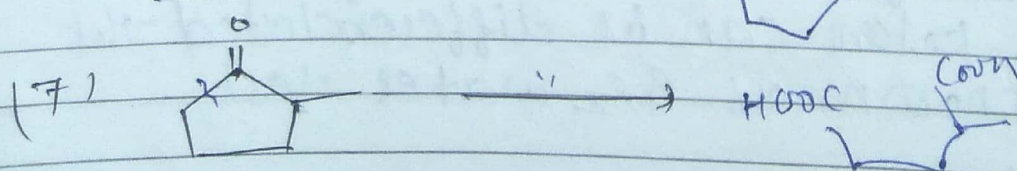
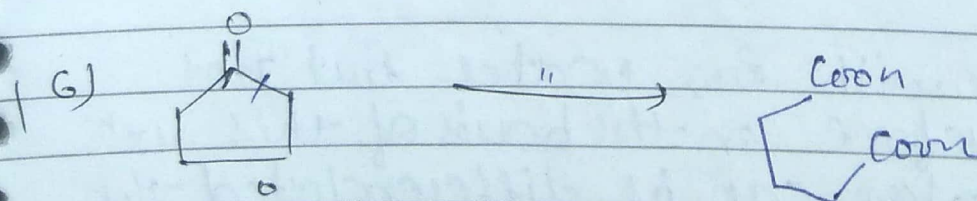
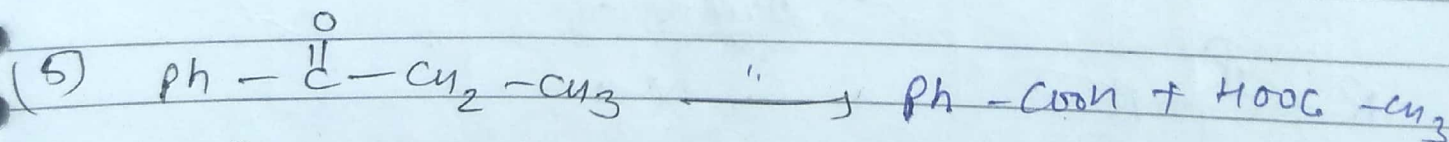
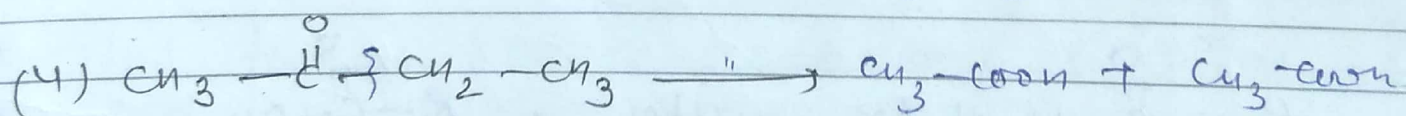
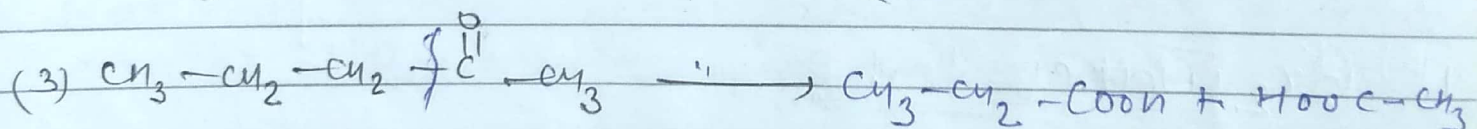
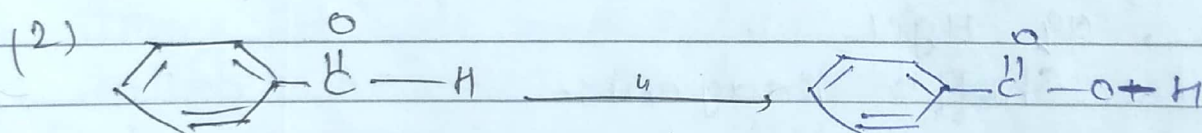
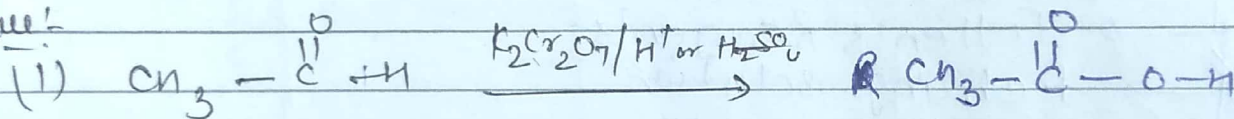
Note! SeO_2 oxidised allylic and benzylic hydrogen.
OH group.



* Oxidation by Strong oxidising Agent (SOA):

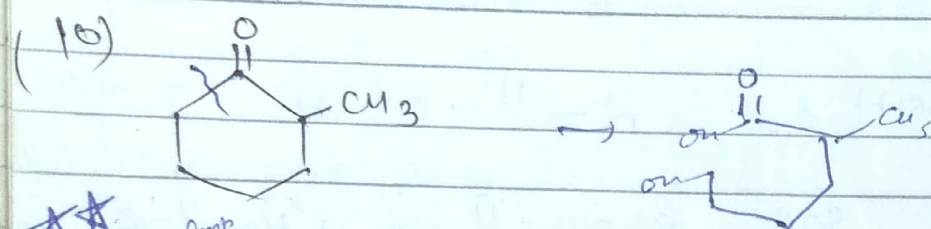
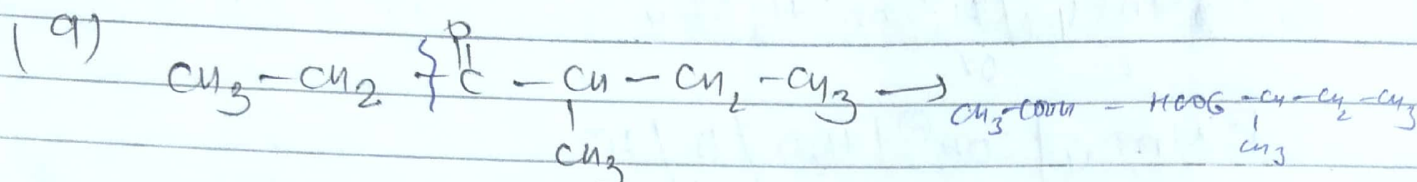
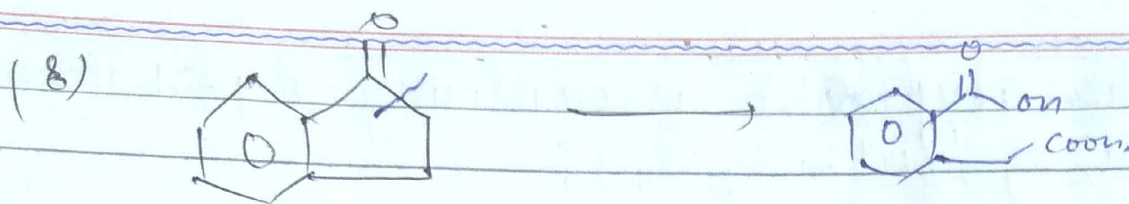


Que:-



η - ald
change

$R - \text{ke}$

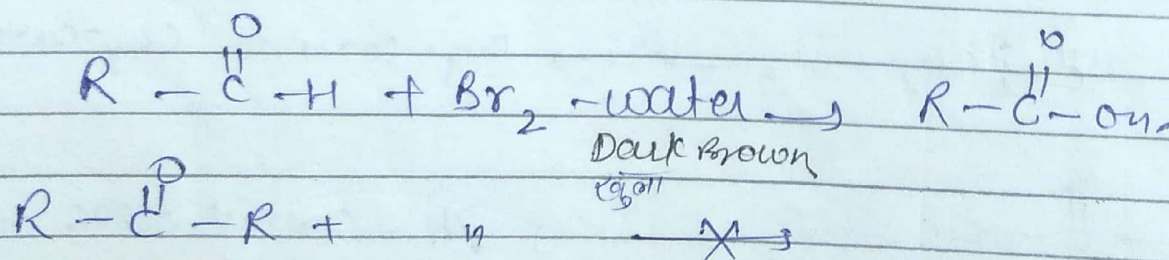


*** Oxidation by MOA! (Mild Oxidising Agent)

~~Very Imp.~~

- Br_2 - water
- Tollen's Reagents
- Fehling solution
- Benedict Solution
- aq HgCl_2 "
- Schiff's Reagents.

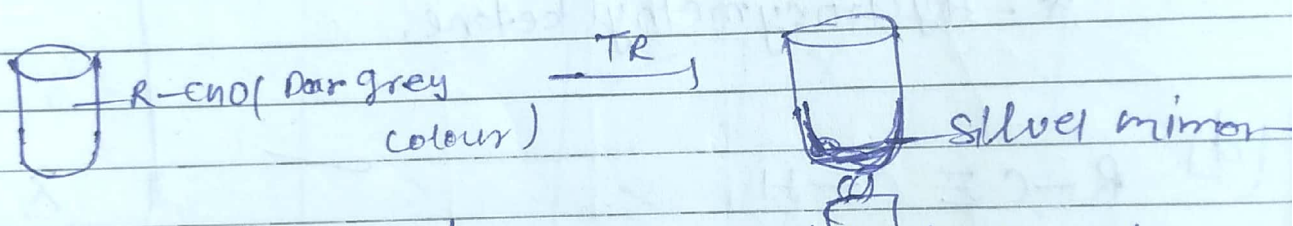
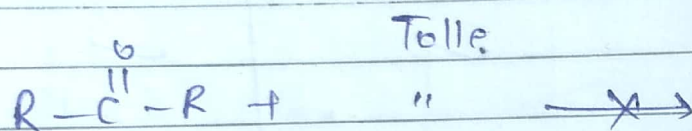
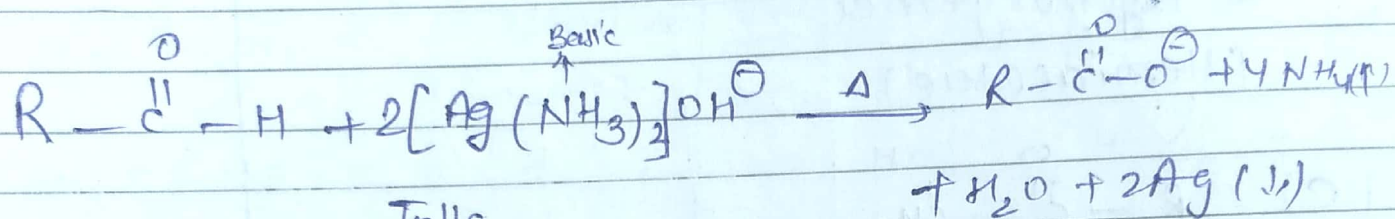
1) Br_2 water test



Aldehyde react with Br_2 water But not ketone. therefore on the basis of this aldehyde & ketone can be differentiated the test is known as Br_2 water test.

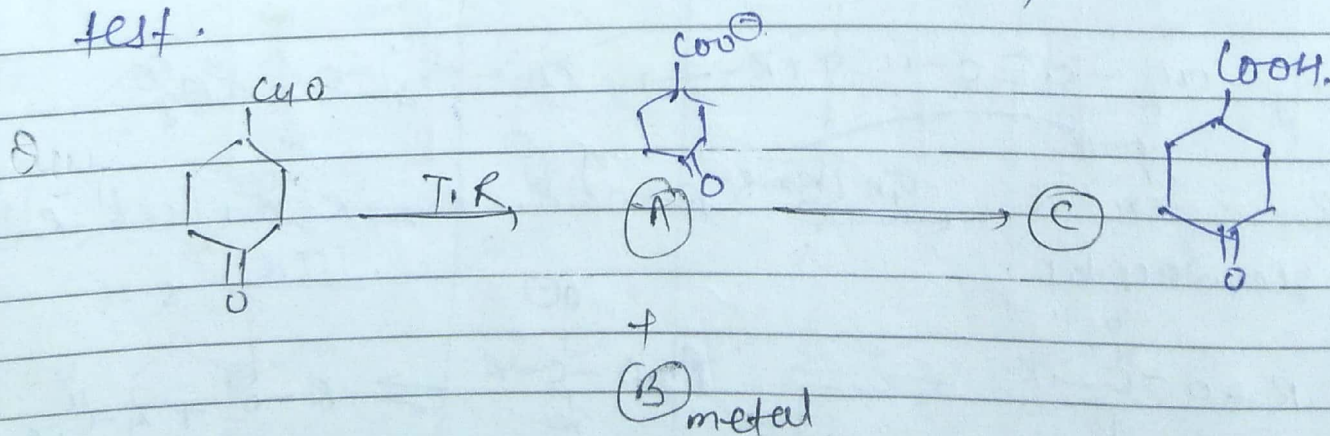
(ii) Tollen's Reagents test :

$R-\text{CHO} \Rightarrow \text{Tollen's Reagents} \Rightarrow \text{Ammonical sol}^n \text{ of silver Nitrate}$
 $\Rightarrow [Ag(NO_3)_2]^{+} OH^{-}$



* Among Aldehyde and ketone Aldehyde React with Tollen's Reagent and form silver mirror But not ketone. By the Help of this Rxⁿ Aldehyde can be differentiated by Ketone

This test is known as Tollen's & Silver mirror test.



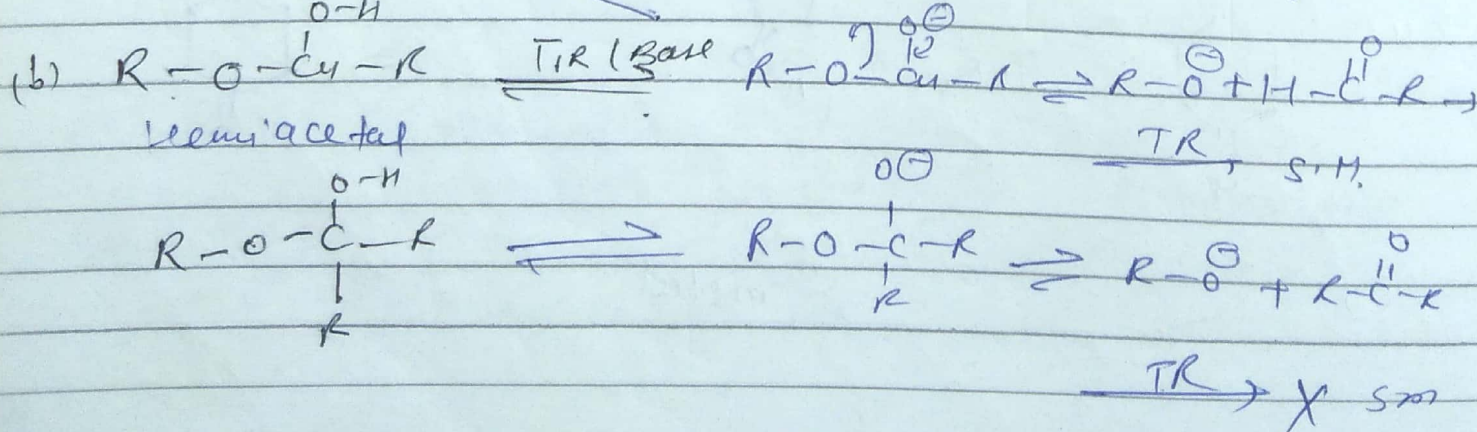
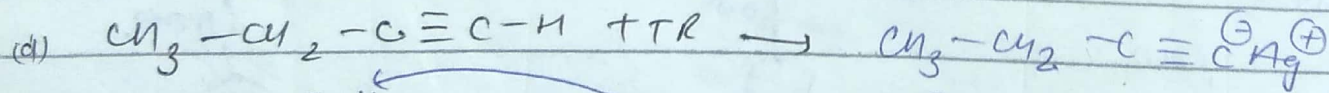
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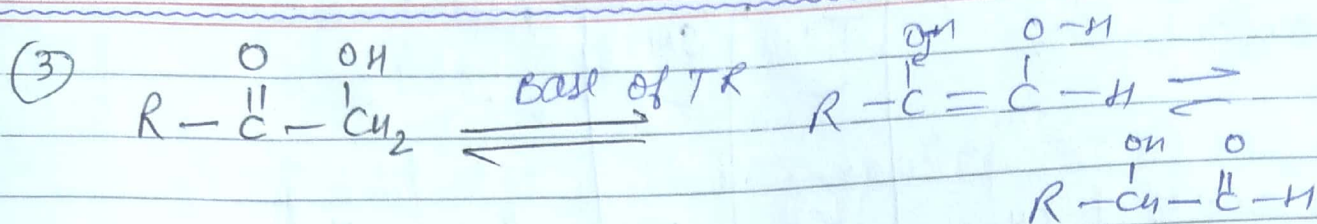
★

Note! following comp. also gives tollen's test

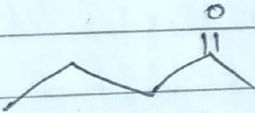
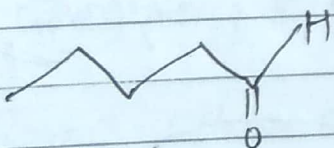
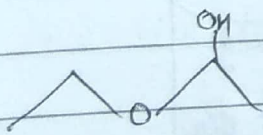
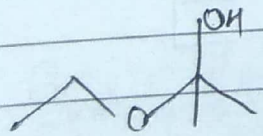
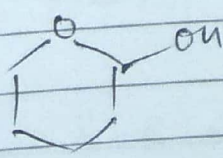
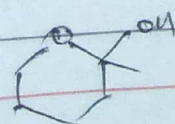
		T. T	silver mirror test
a)	$\text{H}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{OH}$ formic acid	✓	✓
b)	$\text{R}-\text{O}-\overset{\text{OH}}{\underset{\text{O}}{\text{C}}}-\text{R}$ α Hydroxyether (Hemiacetal)	✓	✓
c)	$\text{R}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\overset{\text{OH}}{\text{CH}_2}$ α-Hydroxymethyl ketone.	✓	✓
d)	$\text{R}-\text{C}\equiv\text{C}-\text{H}$	✓	X. white ppt.
e)	$\text{Ph}-\text{NHOH}$	✓	

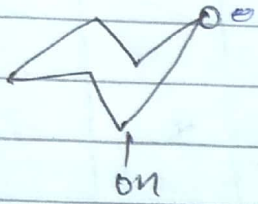
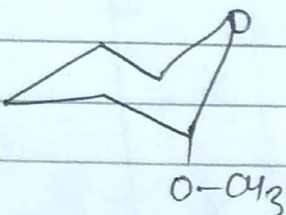
Note! Terminal alkyl gives tollen's test But not silver mirror test because it form white ppt with terminal alkyl not silver mirror





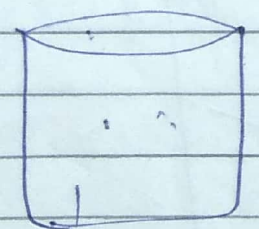
Q Identify the comp. among following which will give Tollen's test and silver mirror test.

	Tollen's test	Silver mirror test	FT	BT
(1) $H-\overset{\overset{O}{\parallel}}{C}-OH$	✓	✓	✓	✓
(2) $CH_3-\overset{\overset{O}{\parallel}}{C}-OH$	✗	✗	✗	✗
(3) $H-\overset{\overset{O}{\parallel}}{C}-CH_3$	✓	✓	✓	✓
(4) $PH-\overset{\overset{O}{\parallel}}{C}-H$	✓	✓	✗	✗
(5) $CH_3-\overset{\overset{O}{\parallel}}{C}-CH_3$	✗	✗	✗	✗
(6) 	✗	✗	✗	✗
(7) 	✓	✓	✓	✓
(8) 	✓	✓	✓	✓
(9) 	✗	✗	✗	✗
(10) 	✓	✓	✓	✓
(11) 	✗	✗	✗	✗

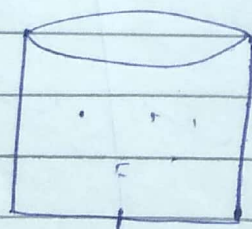
	TT	SMT	F.T	B.T
(12) $\text{CH}_3 - \overset{\text{O}}{\underset{\text{OH}}{\text{C}}} - \text{CH}_2$	✓	✓	✓	✓
(13) $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$	X	X	X	X
(14) $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{C} - \text{H}$	✓	X	✓	✓
(15)  ether X-OH	✓	✓	✓	✓
(16)  O-CH ₃	X	X	X	X

(iii) ★ Fehling Test :

OR
oxidation by Fehling solution : only Comp



aq. CuSO_4
f. solution 1

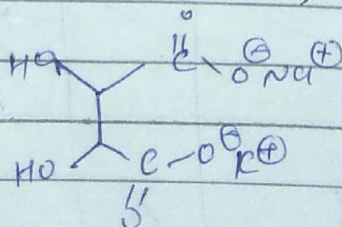


NaOH + aq. sod. Pot.
Tartrate
(Rochelle salt)

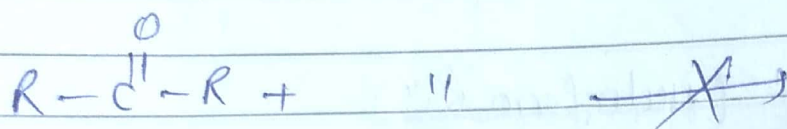
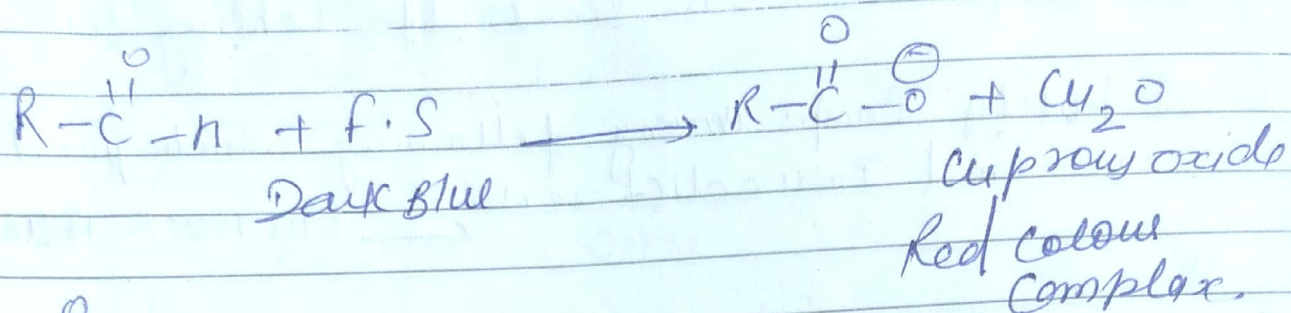


Fehling
solⁿ
Dark Blue

Cu^{++} Complex
with Tartrate ion



Red +1
Blue +2



★

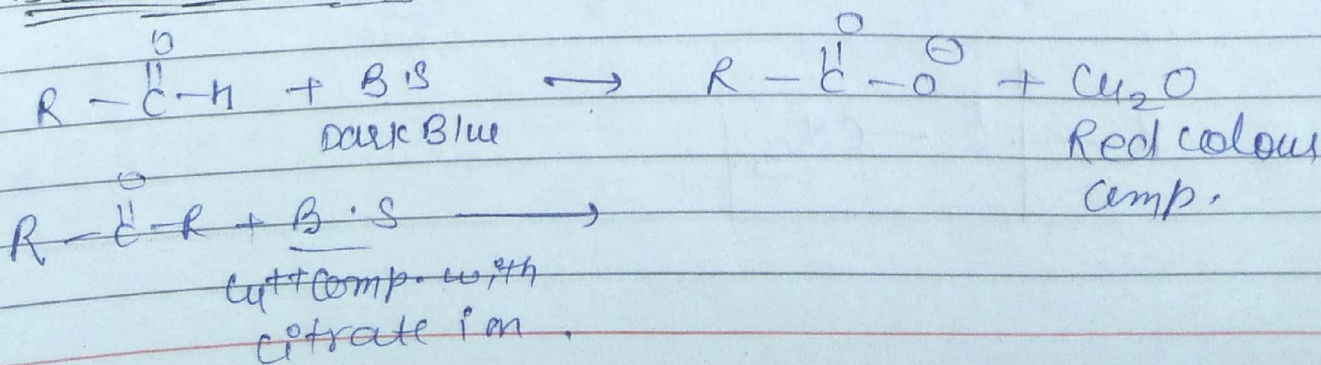
* Aldehyde converted dark blue of Fehling solution to red colour compound Cu_2O but not ketone therefore by the help of this Rxn Aldehyde and ketone can be differentiated to each other the test is known as Fehling test.

* On reacting Fehling solⁿ aldehyde converted to acid but not ketone.

* Note: Benzaldehyde (aromatic aldehyde) not give Fehling test

* Some other comp. also give this test
(1, 2, 3, 4, in follow test)

* Benedict test:



* Work of BS is similar to Fehling solⁿ.

Q. Identify Comp. among following which give Fehling test and Benedict test. $\leftarrow$ In Back page.

Haloform test: (Haloform Rxⁿ)

$\text{CHX}_3 \Rightarrow$ Haloform

$\rightarrow \text{CHF}_3 \Rightarrow$ Fluoroform $\Rightarrow$ P.b. $\rightarrow$ colourless

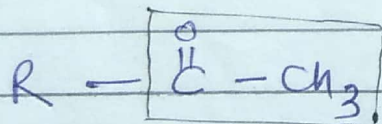
$\rightarrow \text{CHBr}_3 \Rightarrow$ Bromoform $\Rightarrow$ Yellow colour only liquid

$\rightarrow \text{CHI}_3 \Rightarrow$ Iodoform $\Rightarrow$ Sweet smelling liquid

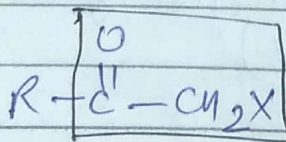
$\rightarrow \text{CHCl}_3 \Rightarrow$ Chloroform $\Rightarrow$ Sweet smelling liquid
Solid $\downarrow$ Anti-septic
Use for Anaesthesia

* Those Rxⁿ which directly give produce Haloform as one of the product is known as Haloform Rxⁿ.

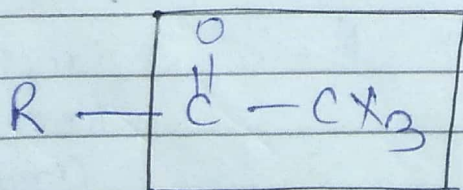
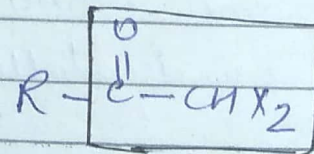
* Following Comp. give Haloform Rxⁿ when treated with X_2/base .

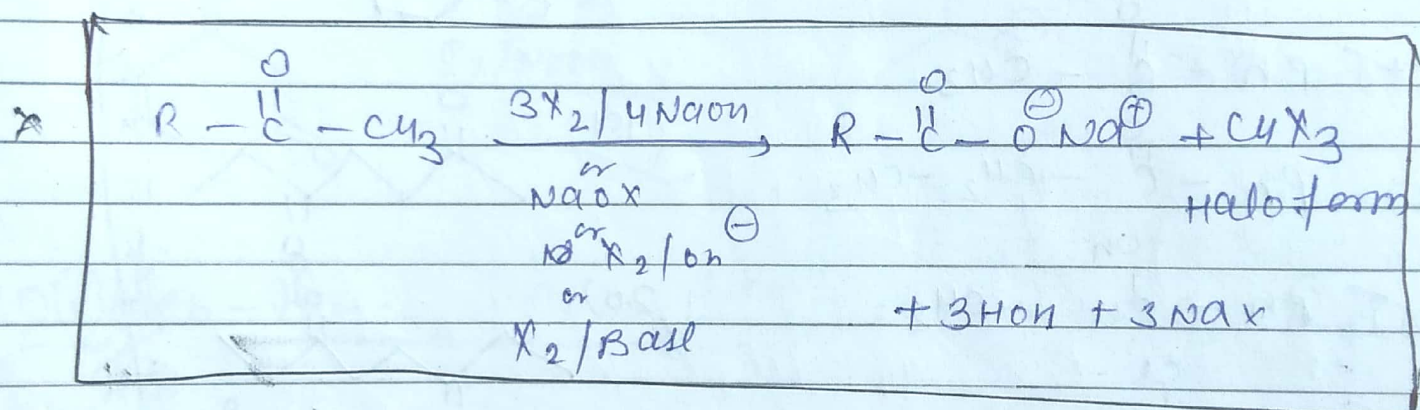
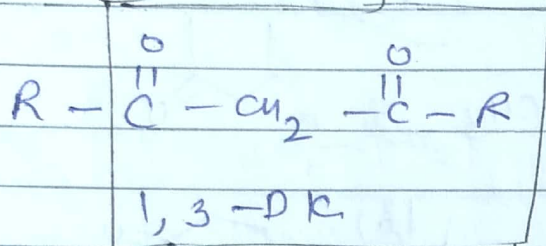
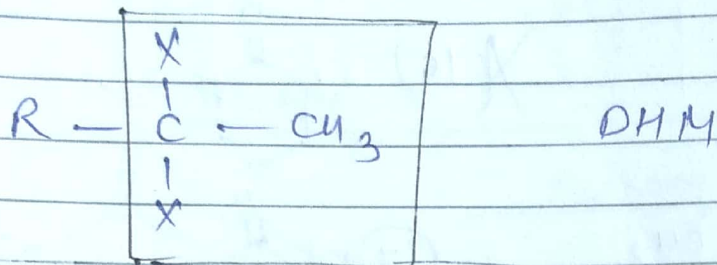
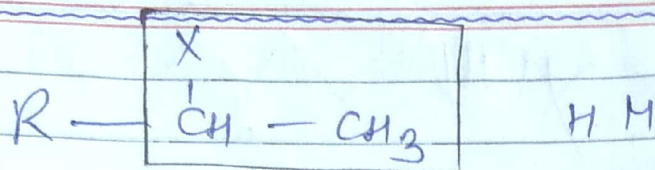


Methyl ketone

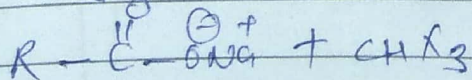
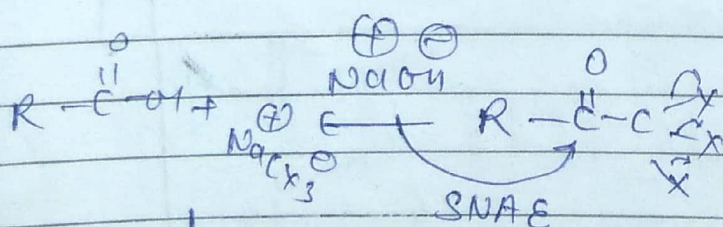
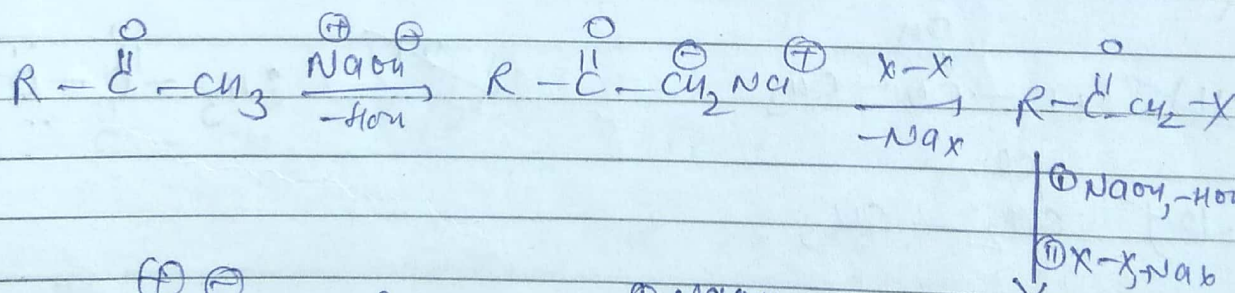


α -Halomethyl ketone

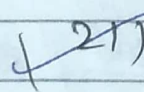
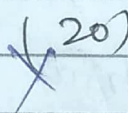
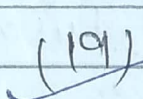
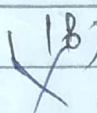
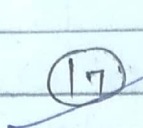
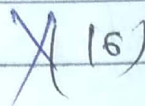
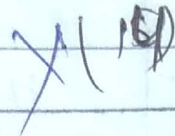
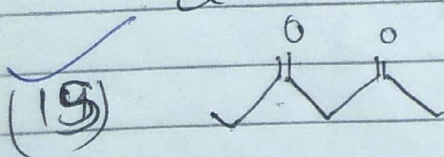
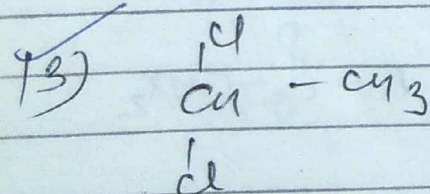
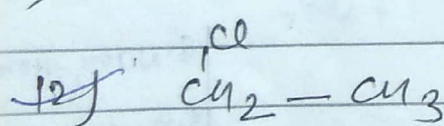
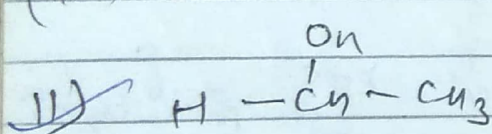
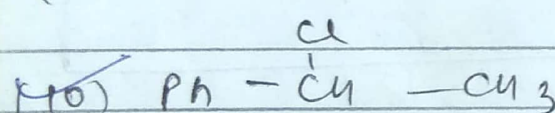
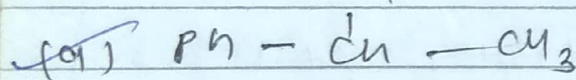
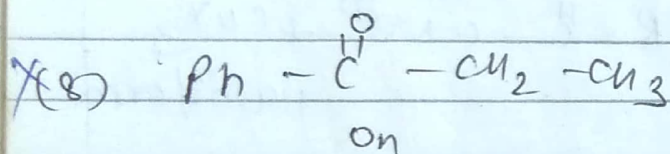
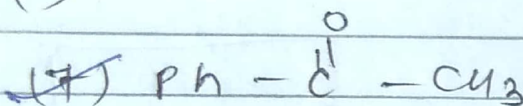
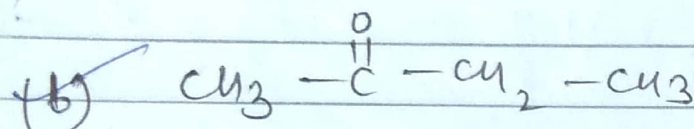
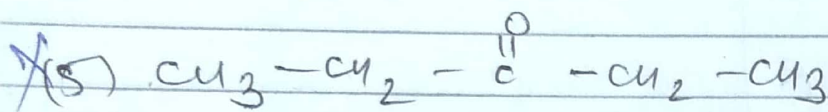
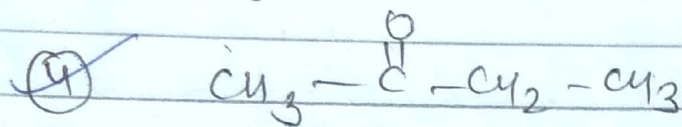
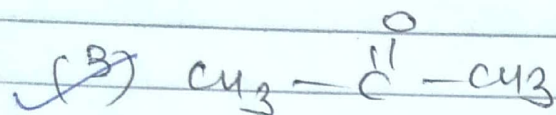
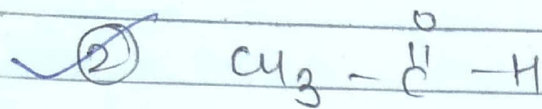
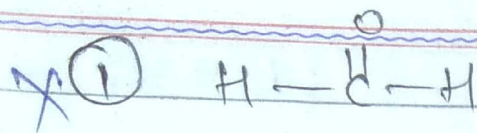




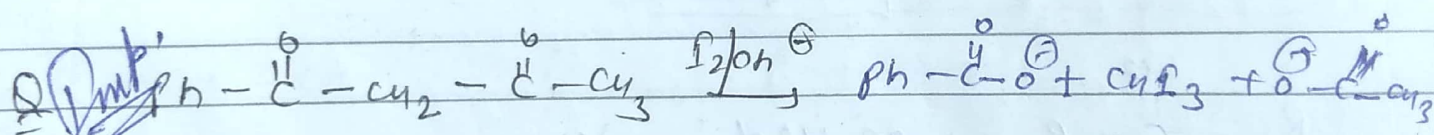
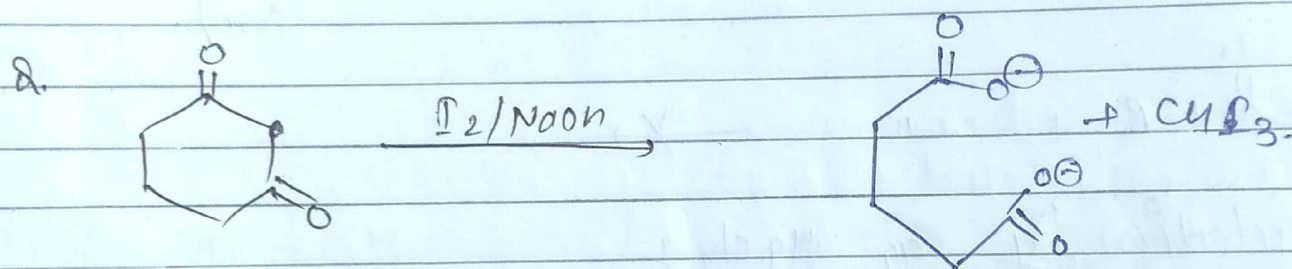
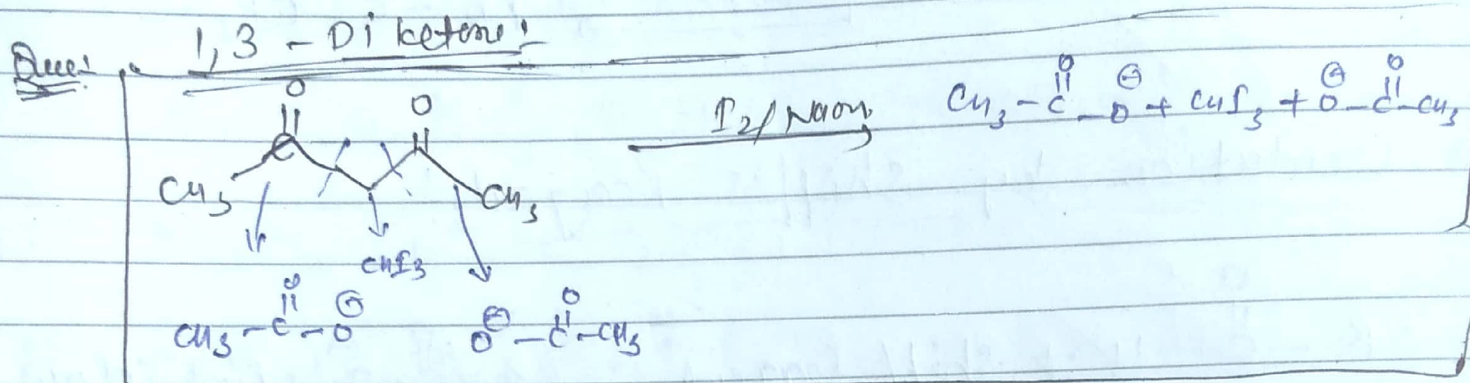
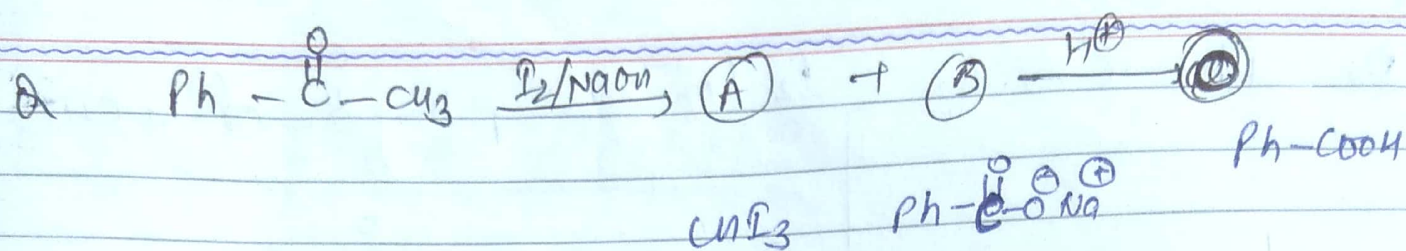
Mechⁿ:



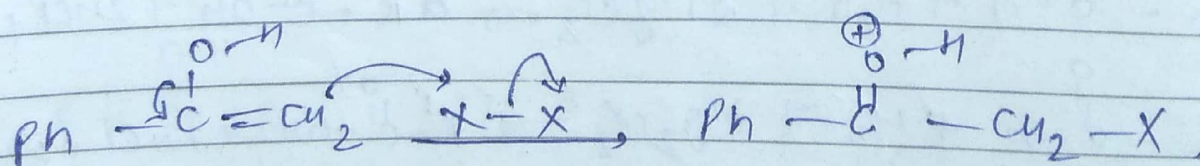
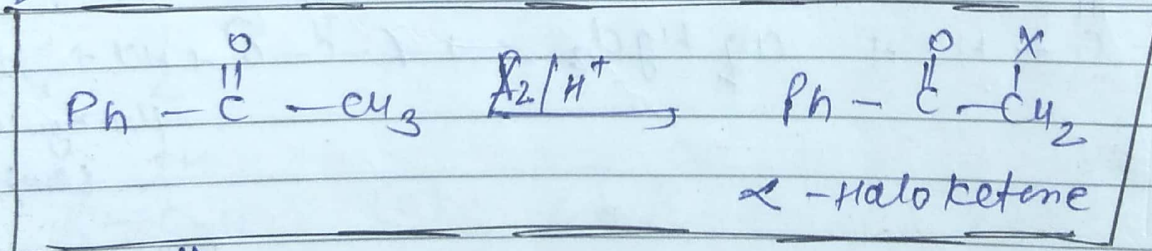
$I_2 / NaOH$



Ketone $\rightarrow$ Carb u2 n et Hkoren

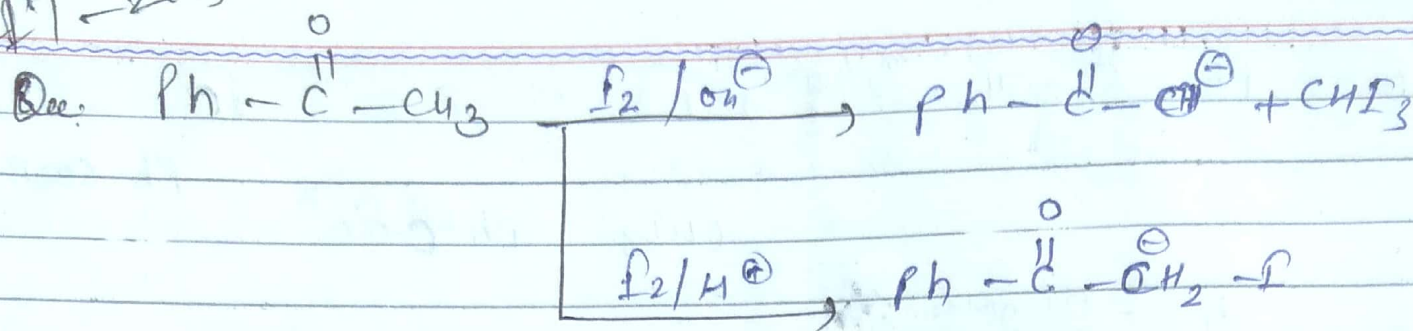


Haloform Rxn in the Presence of Acid:

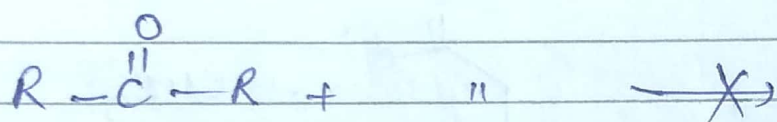
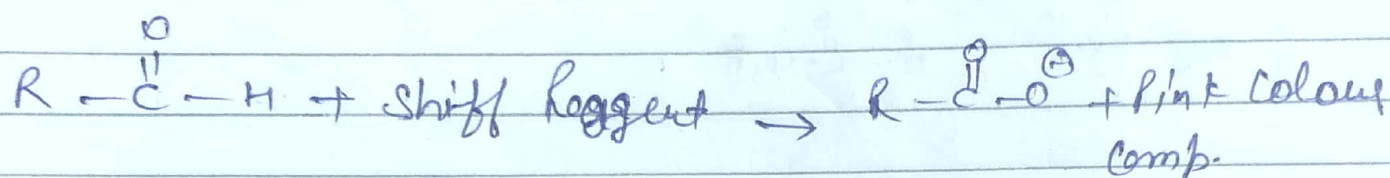


Entry

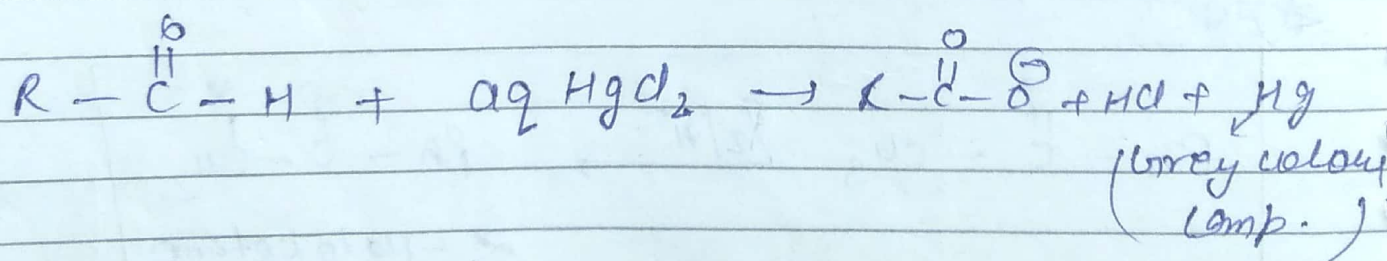
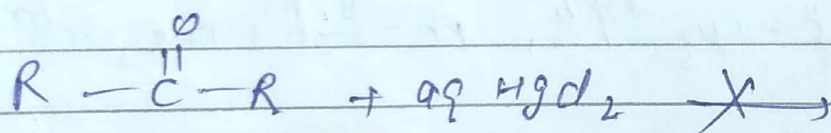
QPT-2015



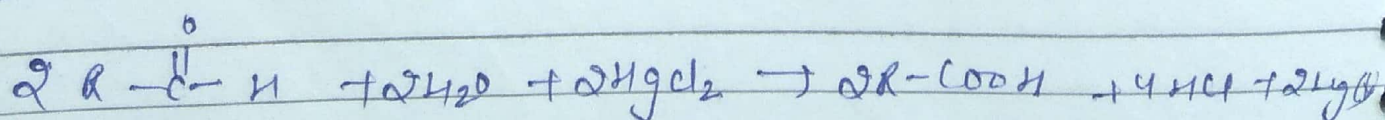
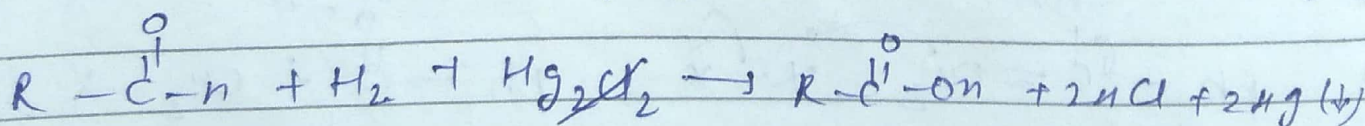
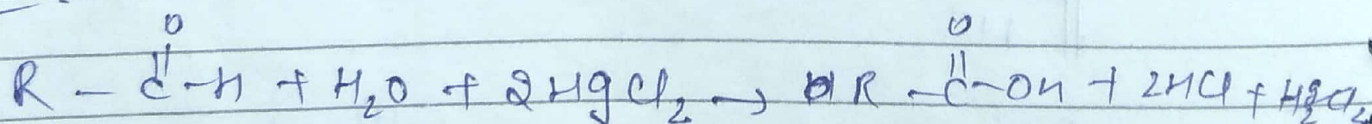
* Oxidation by Schiff's Reagents:



* Oxidation by aq. HgCl_2 :



Mech:



* Oxidation of alcohol

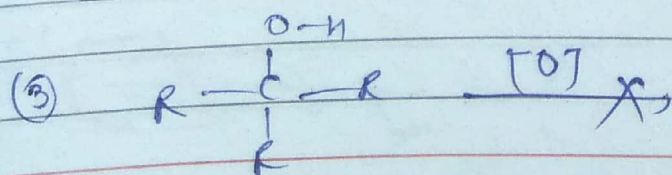
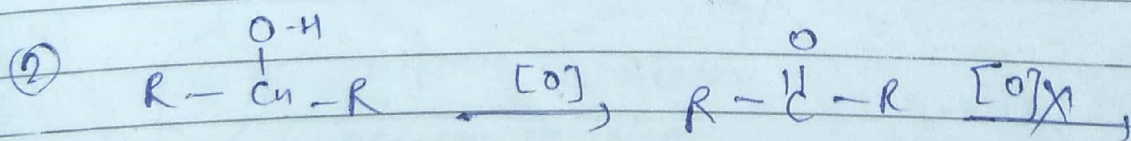
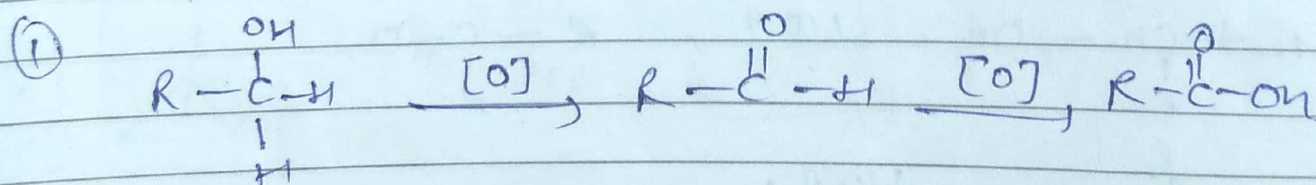
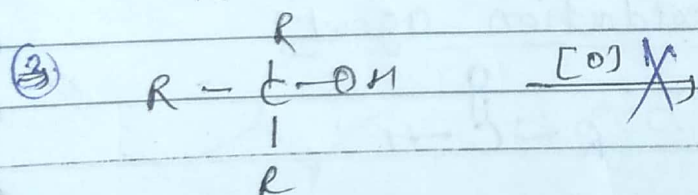
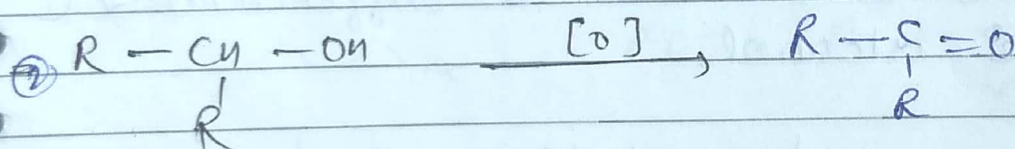
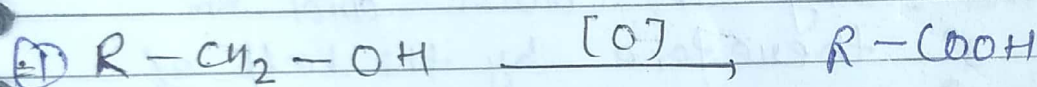
(1) by strong oxidising agent:

(1) $K_2Cr_2O_7 / H^+$ or H_2SO_4 (orange colour)

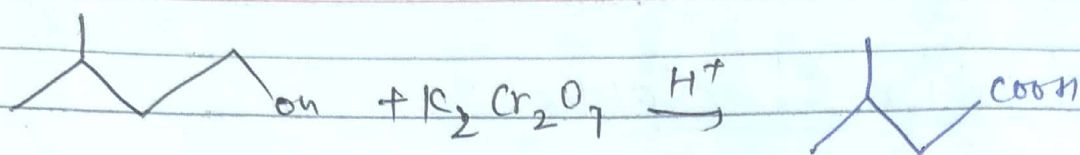
(2) $KMnO_4 / H^+$ or H_2SO_4 (Purple)

(3) CrO_3 / H_2SO_4 or H^+ (Jones's Reagent)

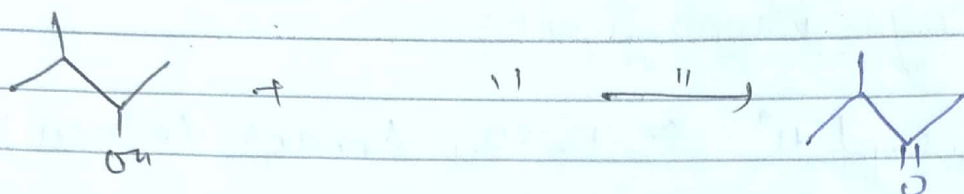
(4)



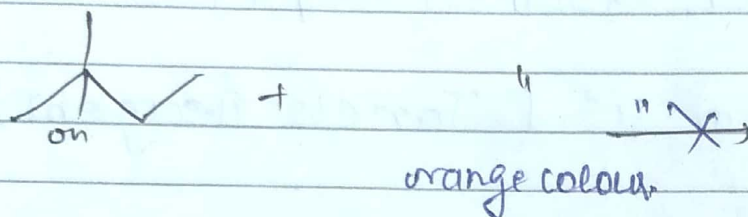
Ques:



Ques:

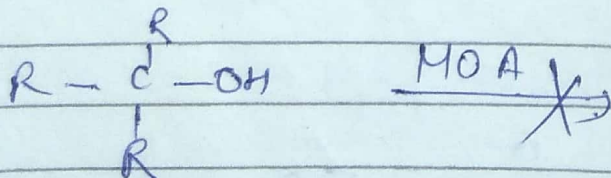
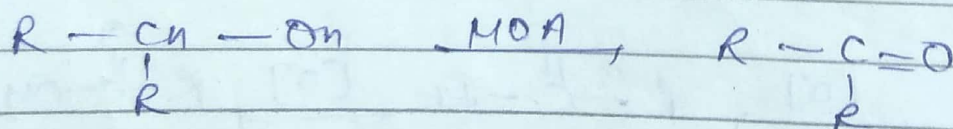
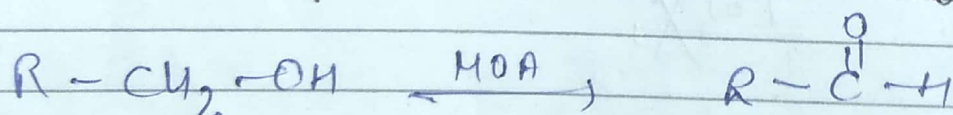


Ques:



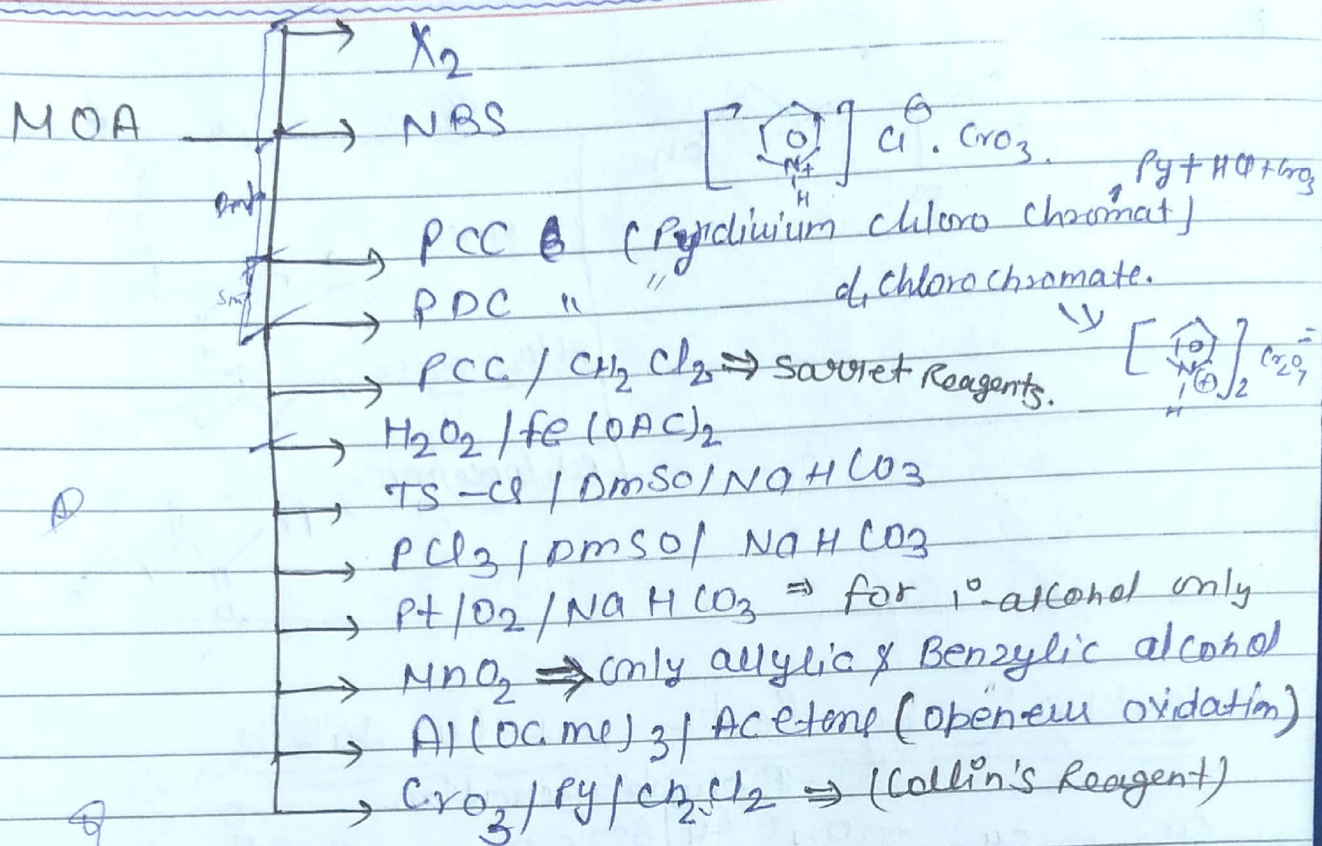
* One $1^\circ, 2^\circ$ alcohol react with $\text{K}_2\text{Cr}_2\text{O}_7$ and KMnO_4 and change its colour and ~~km~~
But not 3° therefore by the help of
this rxn $1^\circ, 2^\circ$ alcohol can be differentiated
from 3° alcohol.

* Oxidation by mild oxidation agent:

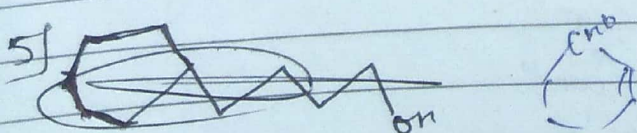
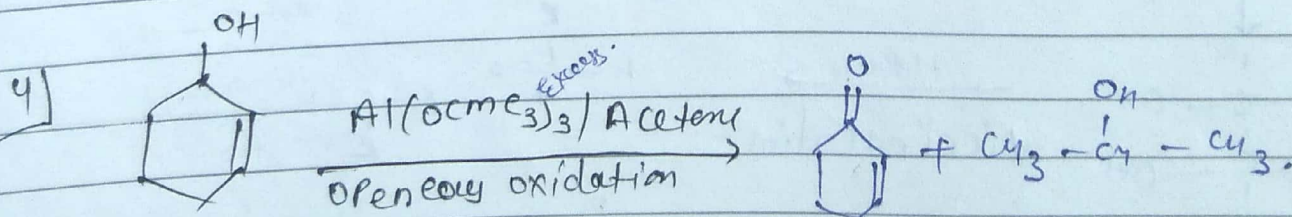
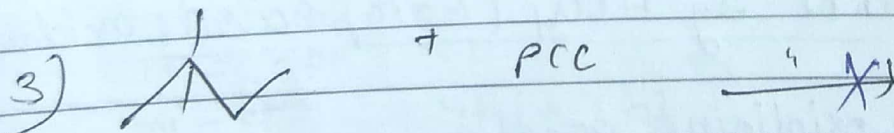
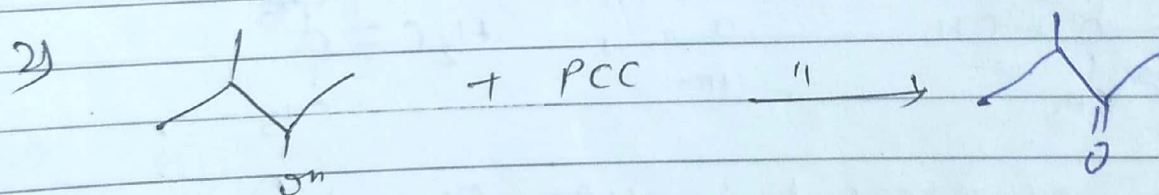
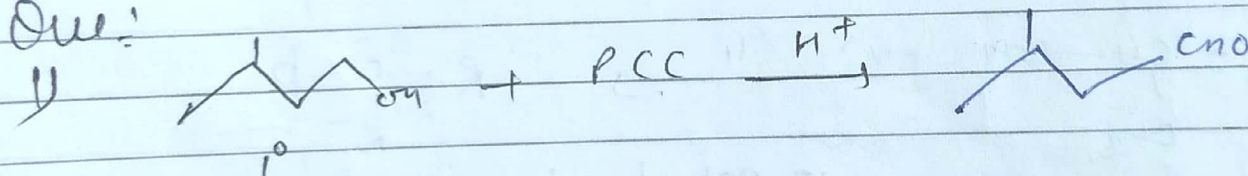


PH $\xrightarrow{PCC}$ CHO

LOGU



Que:

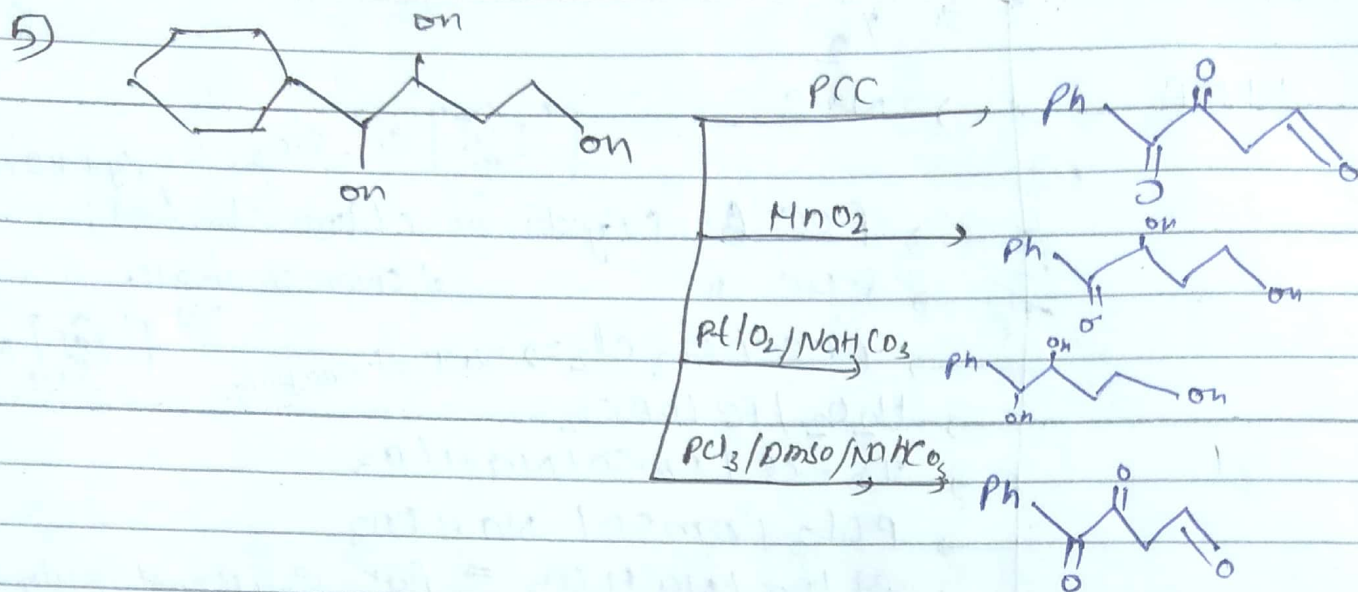


Friday

Halogen reactions

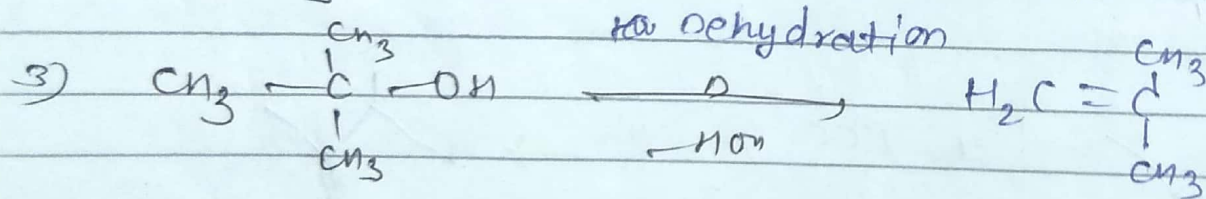
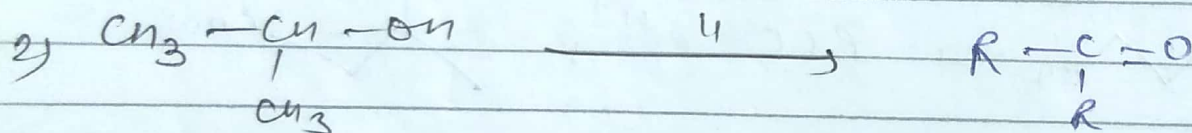
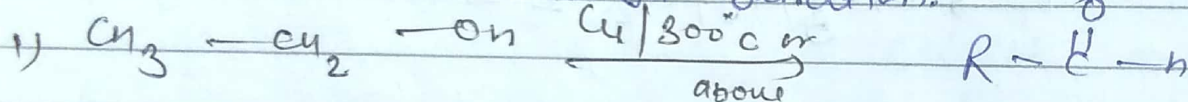
Reduction after acid

nitrogen, oxidation



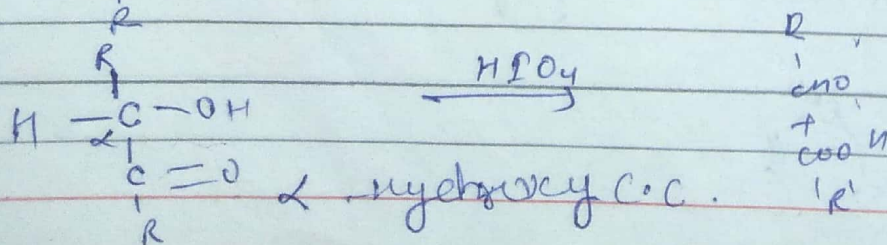
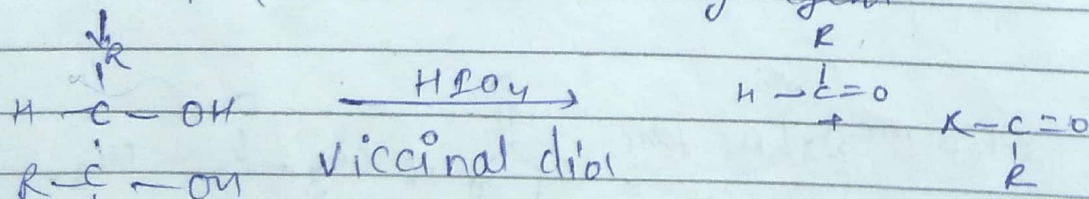
* Oxidation by Red - Hot Cu tube!

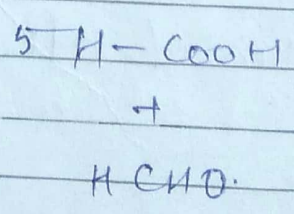
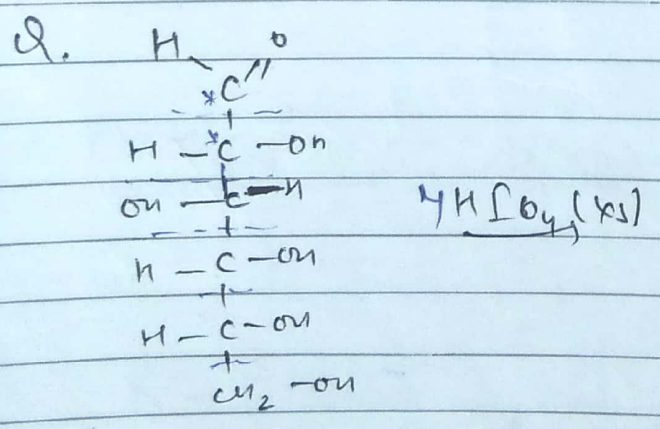
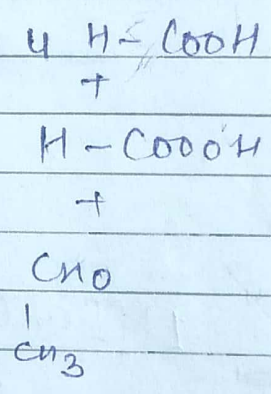
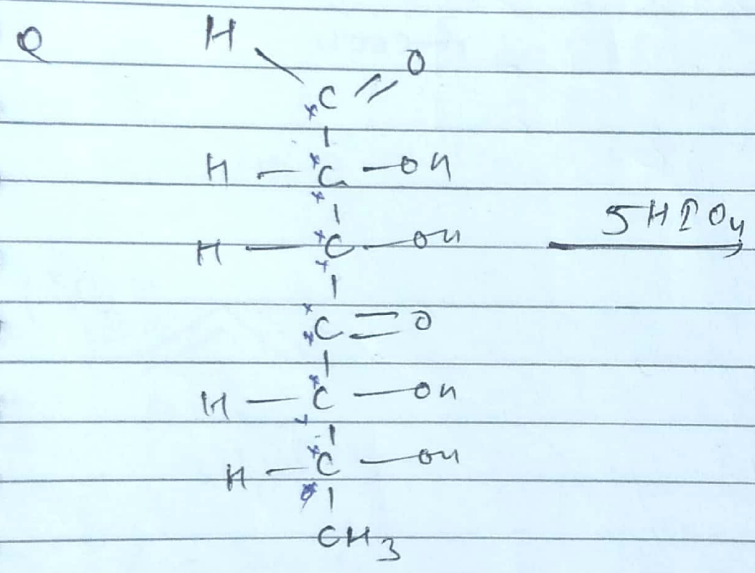
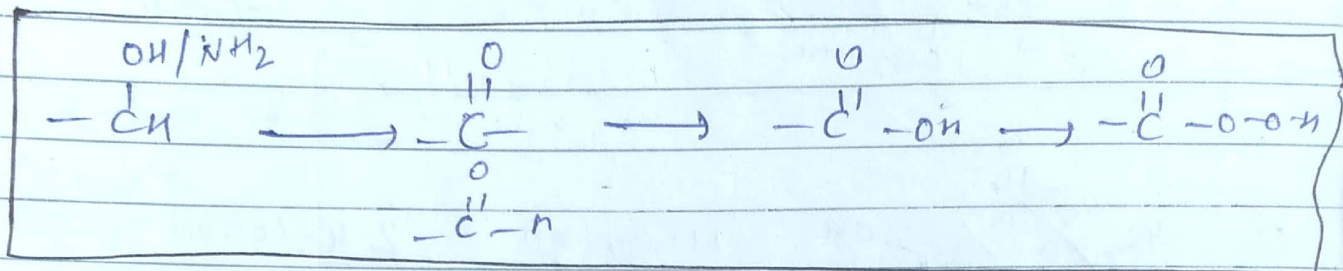
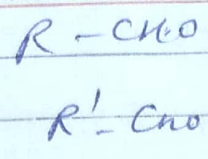
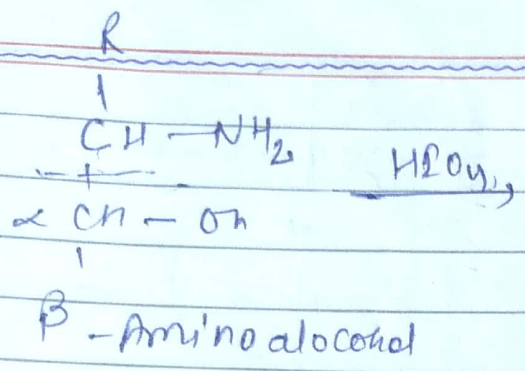
Dehydrogenation.



* Oxidation of Alcohol by HPO_4 (Malaprade's oxidation)

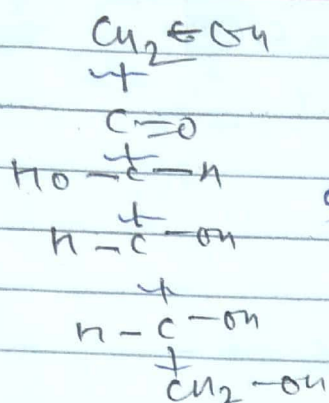
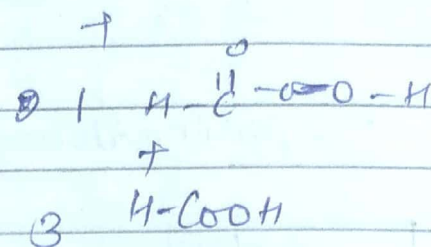
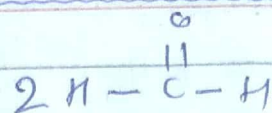
HPO_4 (special oxidising agent.)



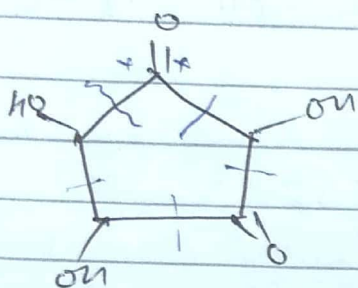
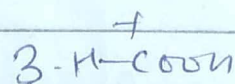
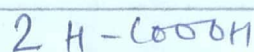


D Glucose

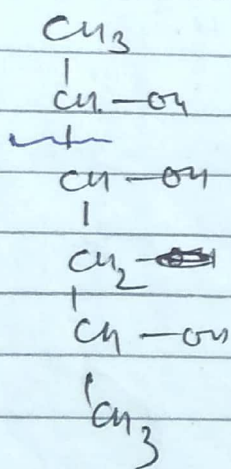
Q

5HIO₄(x1)

Q

HIO₄(x1)

Q

1HIO₄(x1)

* oxidation of alk

SBG STUDY