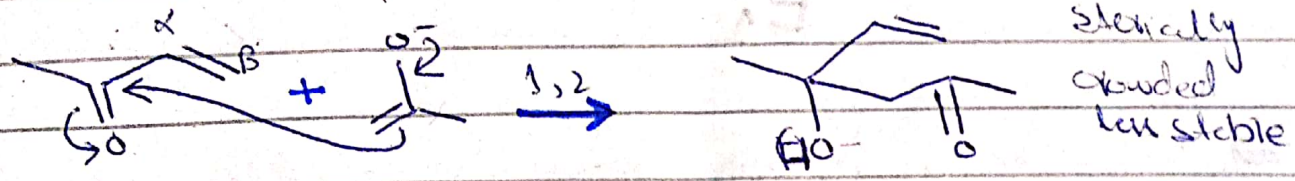
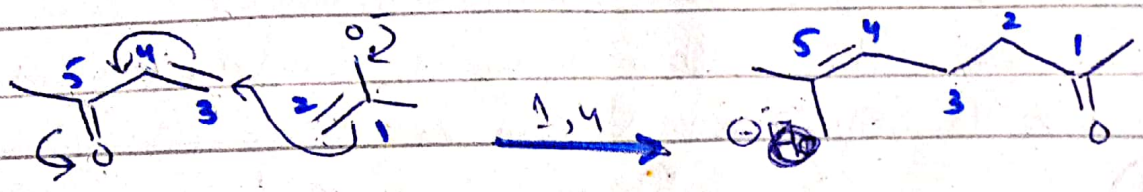
Michael addition

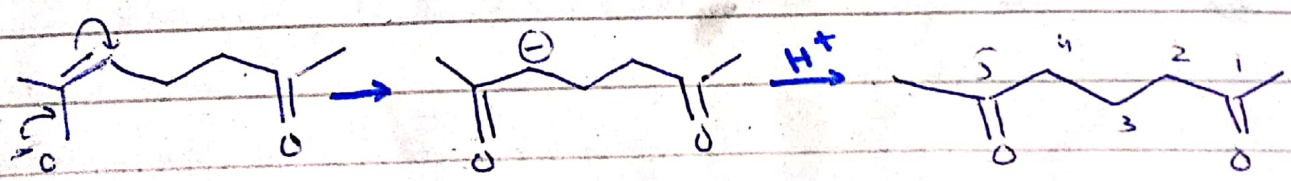
1,2
direct addition
hard site

1,4
conjugate addition
soft site

→ Michael addition majorly give (1,4)

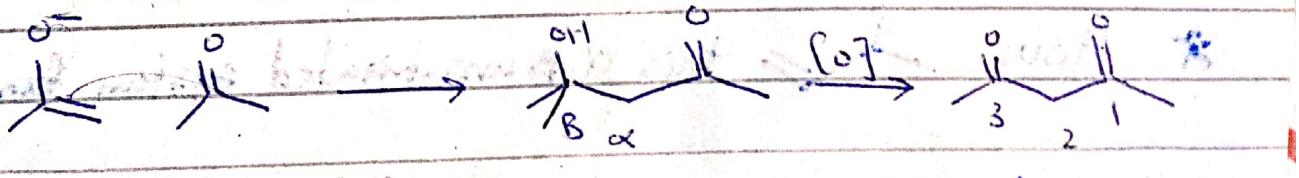






1,5-dicarbonyl

Aldol condensation:-

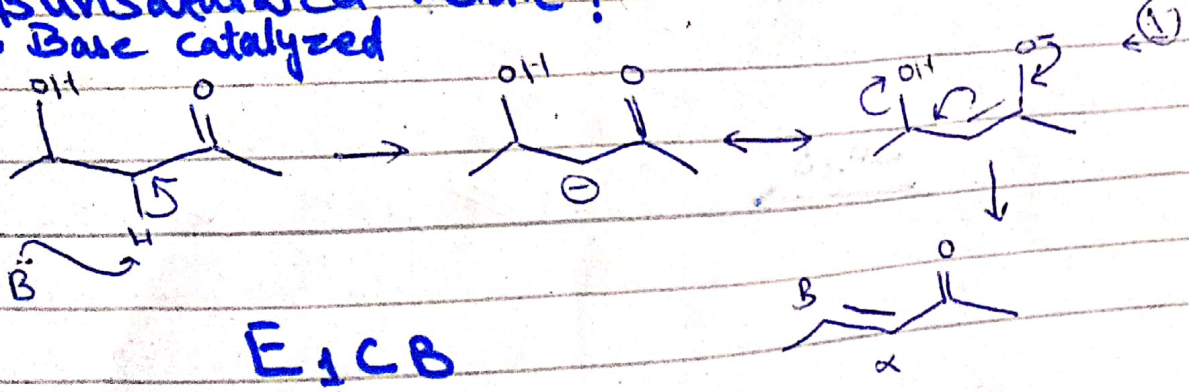


β hydroxy carbonyl 1,3-dicarbonyl

this is only method to form 1,3 dicarbonyl

How elimination of β-hydroxy carbonyl occur to form α-β unsaturated ketone?

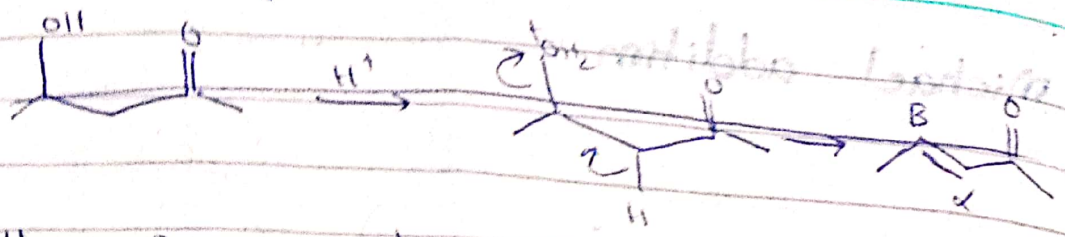
⇒ Base catalyzed

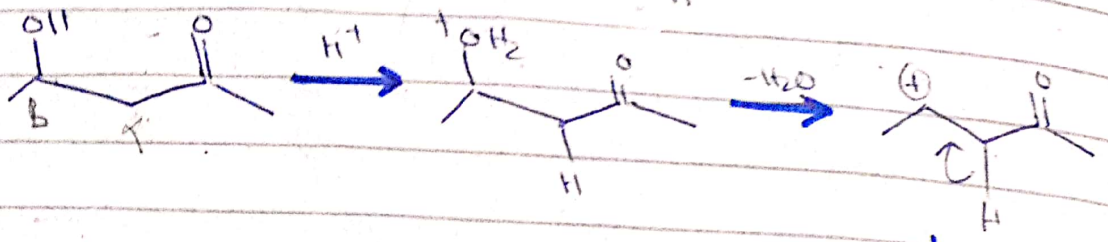


E_1cB

E_1 conjugate Base

Acid catalyzed:-





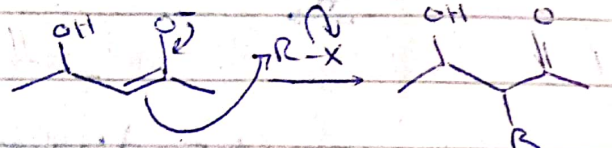
E_1

⇒ E_1CB → in this anion form which is stabilize by carbonyl. (EWG)

⇒ E_1CB is done when carbanion form is stabilize by EWG.

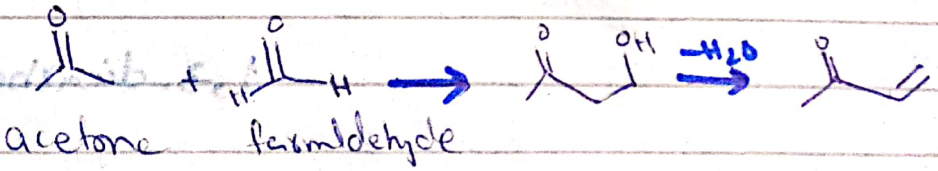
⇒ for E_1CB ① Carbanion must form ② stabilizing (EWG) must present

①  can also undergoes α alkylation like

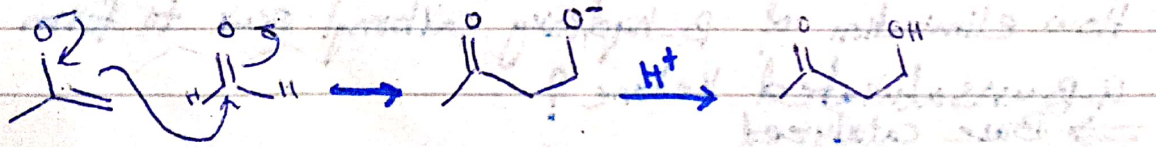


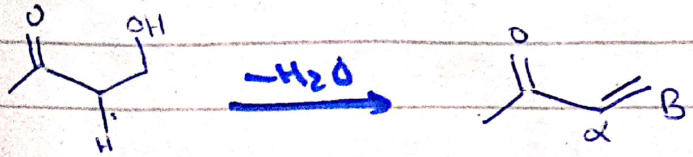
but we want to eliminate so not done this

★ How  this α-β unsaturated system form?

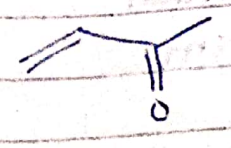


acetone formaldehyde

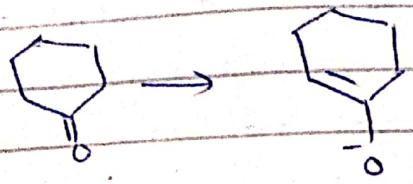




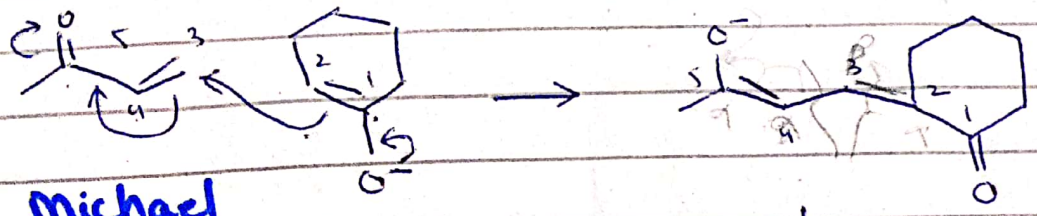
Michael addition



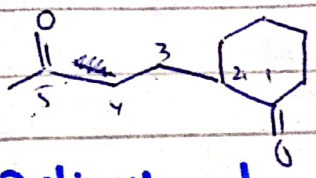
it is Nucleophilic addition of carbanion or another Nu) to α-β unsaturated carbonyl compound.



1

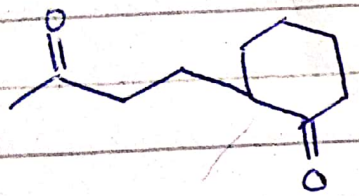


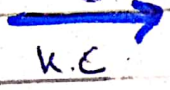
Michael acceptors

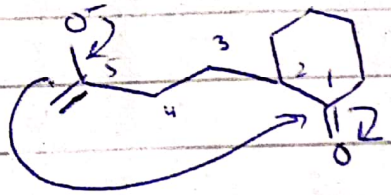


1,5 dicarbonyl

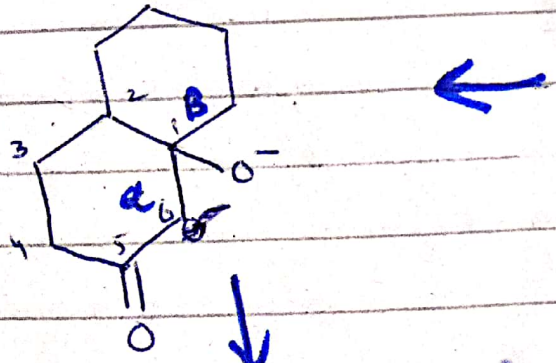
2

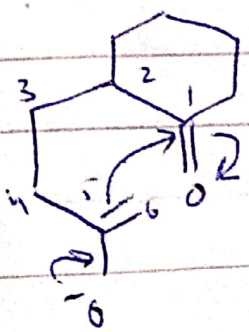


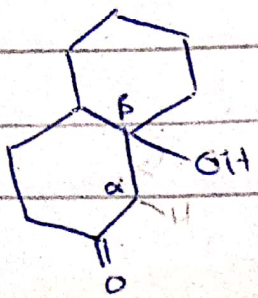




Aldol type condensation



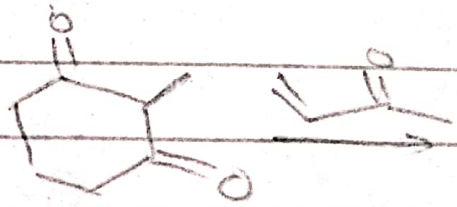


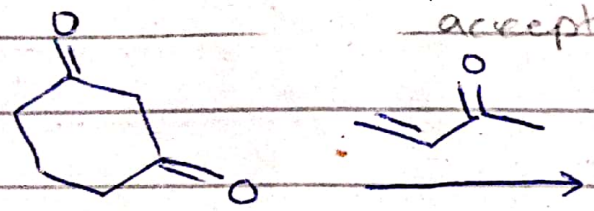


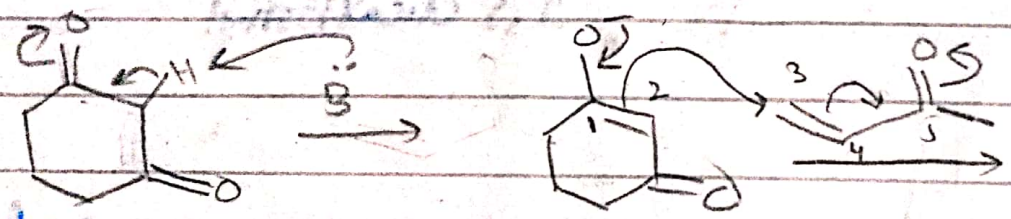
Both step collectively called **Robinson annulation** or **Robinson annelation**

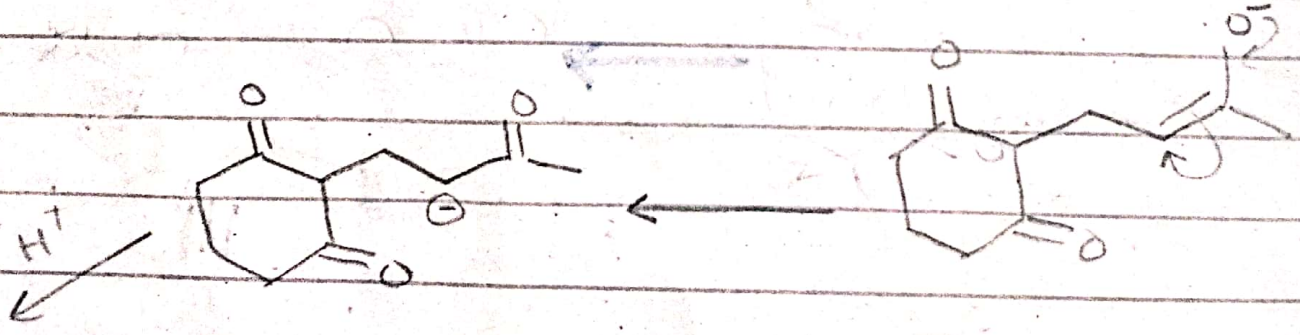
It is classical method of formation of 6 member ring.

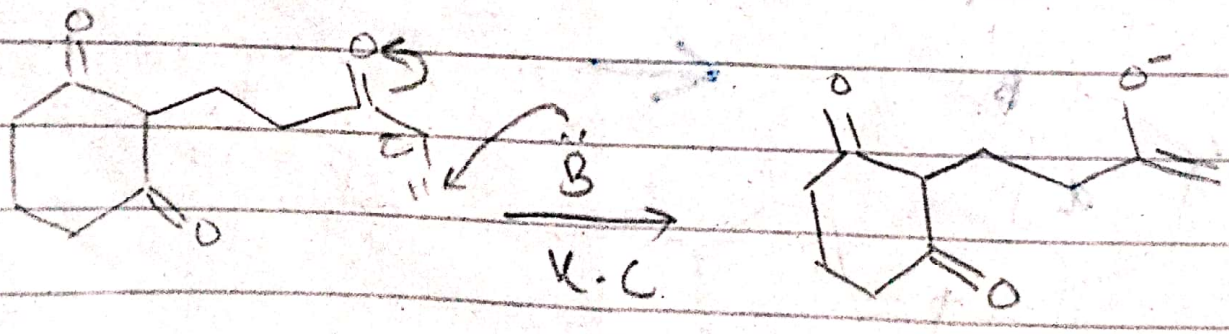
EWG with = bond → Michael acceptor

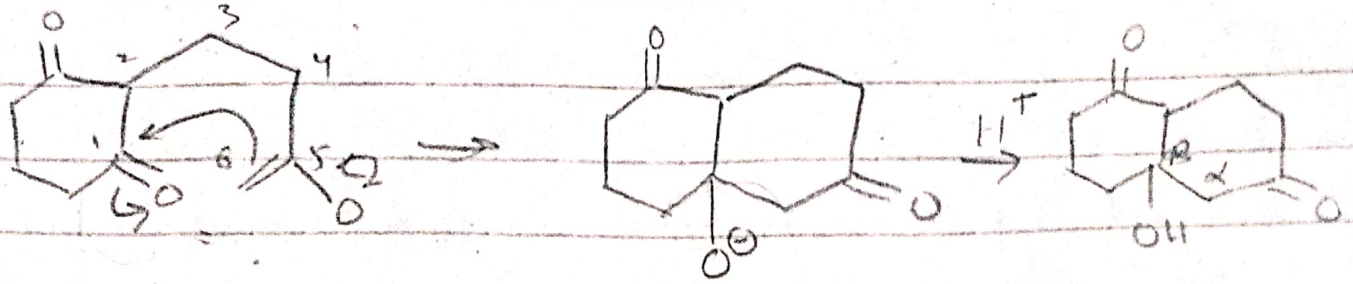


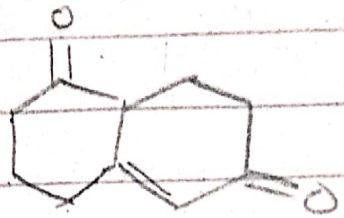


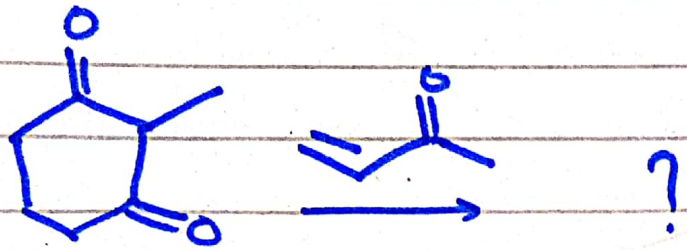


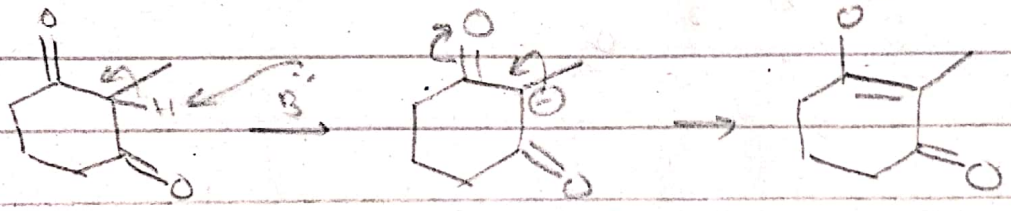


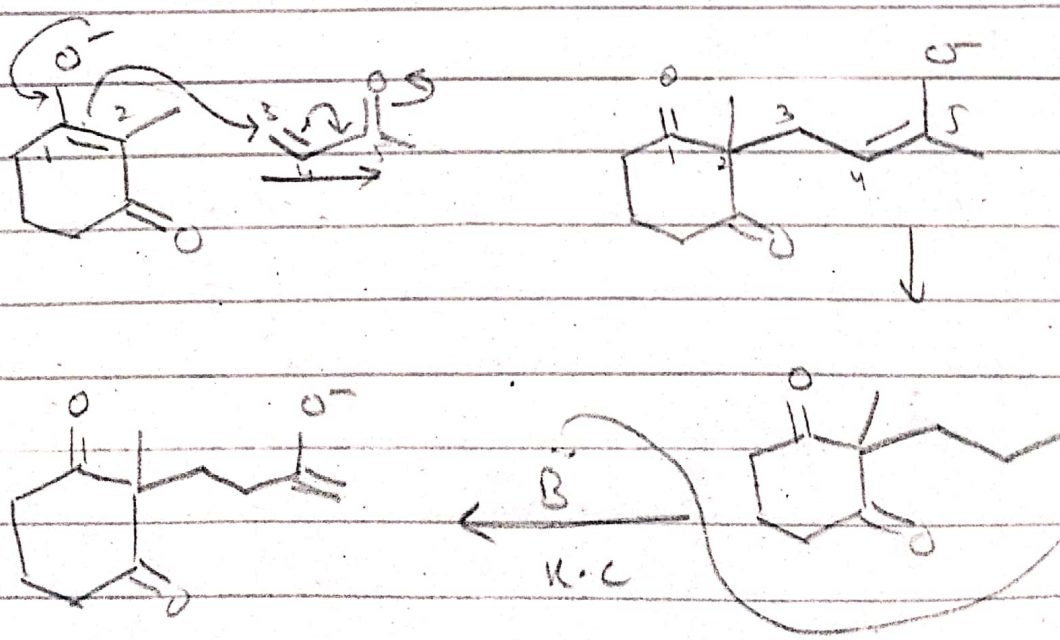


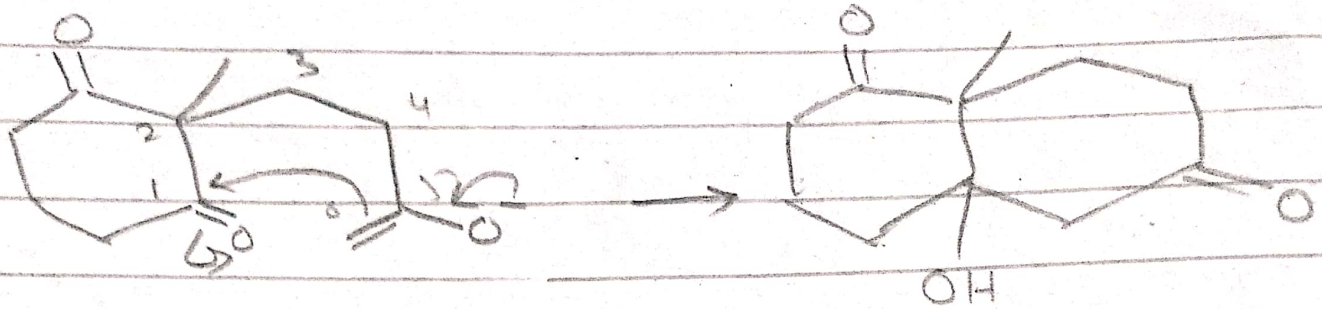




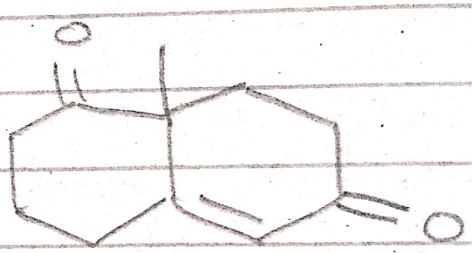




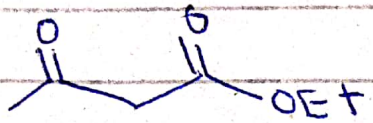


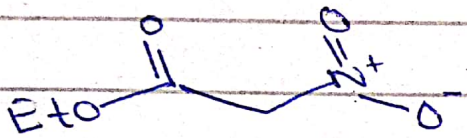


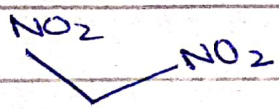
$-H_2O$



Michael donor







Michael acceptor