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Application of E^2 :-

(1) Dehydrohalogenation :

⇒ Reaction in which hydrogen & halogen are eliminated

(1) $CH_3-CH_2-Cl \xrightarrow{\text{Alc. NaOH}} CH_2=CH_2$

0 α H

(2) 

$\xrightarrow{\text{''}}$ 

3 α H

(3) 

$\xrightarrow{\text{''}}$ 

3 α H

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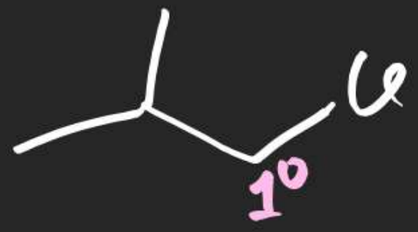
(4) 


6 of H

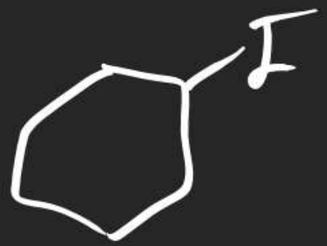
(5) 


6 of H

E_2- rate order

$\gamma_5 > \gamma_4 > \gamma_3 > \gamma_2 > \gamma_1 > \gamma_6$

(6) $D_3C-CD_2Cl \xrightarrow{\Delta} D_2C=CD_2$

(7) 

$(\gamma_7 > \gamma_8 > \gamma_9)$

$\therefore$

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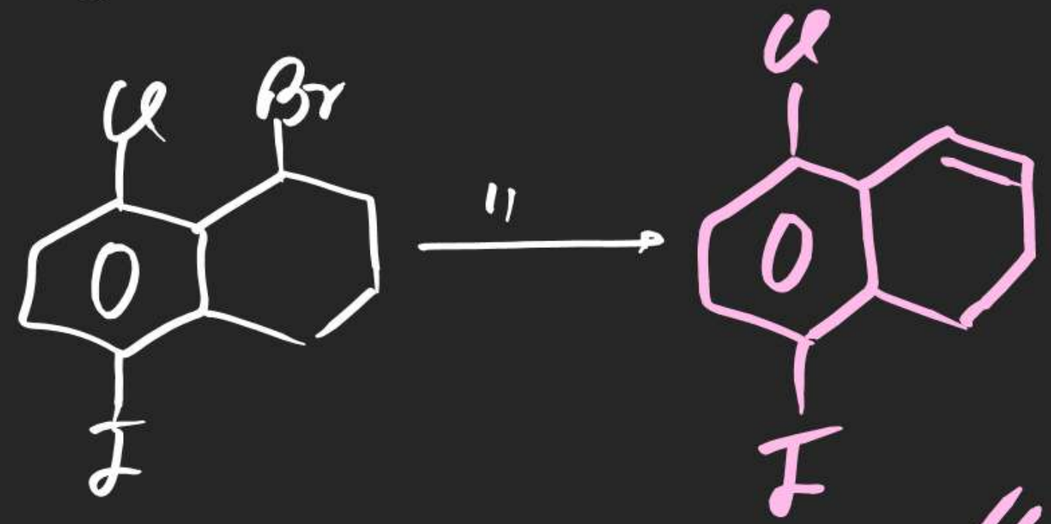
(8) 

(9) 

(10) 

(11) 

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(12) 

(13) $CH_2(Cl)-CH_2(Cl) \xrightarrow{\text{Alc. KOH}} CH_2=CH(Cl)$

$Na^{\oplus}\,{}^{\ominus}C\equiv C^{\ominus}\,Na^{\oplus}$

Imp

(14) $CH_2(Cl)-CH_2(Cl) \xrightarrow[\text{(ii) } NaNH_2]{\text{(i) Alc. KOH}} H-C\equiv C-H$

$-NH_3 \uparrow$ 2 "$NaNH_2$" ✓

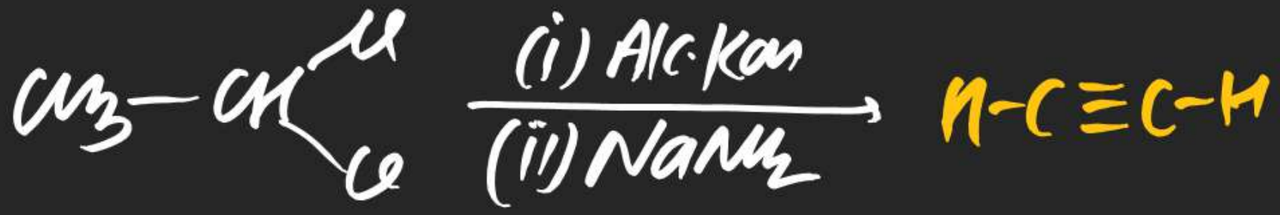
$[H-C\equiv C-H]$

(15) Total No of moles of $NaNH_2$ can be consumed by 1 mole of 1,2-dichloro Ethane.

4 mole

$CH_2(Cl)-CH_2(Cl) \xrightarrow{NaNH_2} [CH_2=CH(Cl)] \xrightarrow{NaNH_2}$ ↑

✓ ✓

(16) 

(17) 

(18) 

(19) 

(20) 

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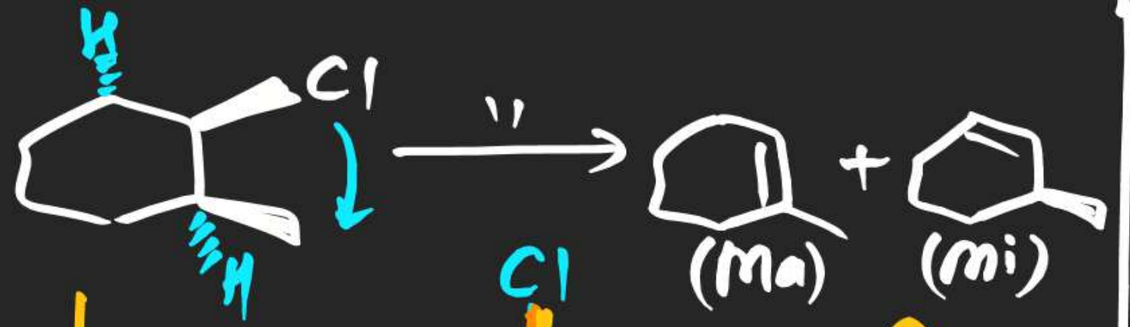
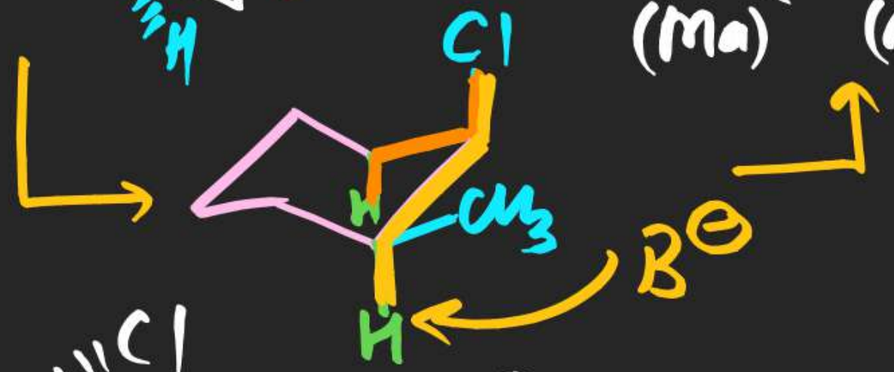
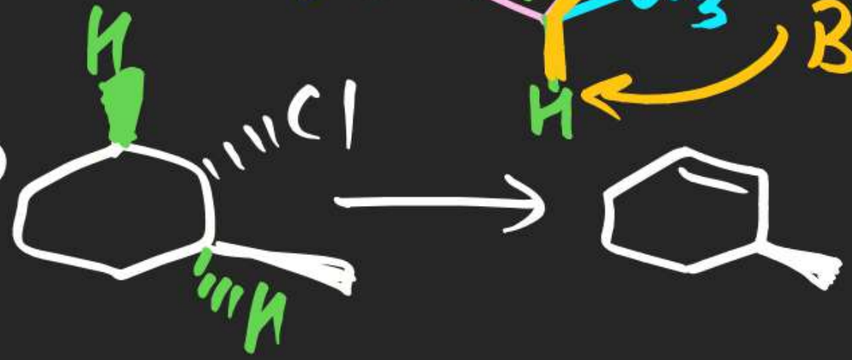
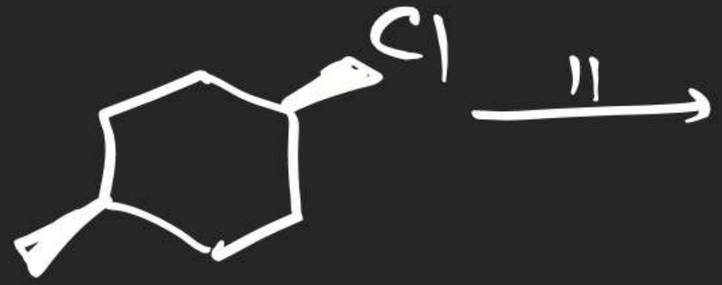
(21) 

Soln: 

(22) 

(23) 

(24) 

(25) 

(26) 

(27) In following observation

Base	Sytzeff	Hofmann
$^{\ominus}OH$	90%	10%
$^{\ominus}OMe$	82%	18%
$^{\ominus}O-C(Me)_3$	30%	70%
$^{\ominus}O-CEt_3$	15%	85%

Note Use of Bulkier Bases like ($Me_3C-O^{\ominus}$ & $Et_3C-O^{\ominus}$) gives Hofmann alkene as a Major Product.

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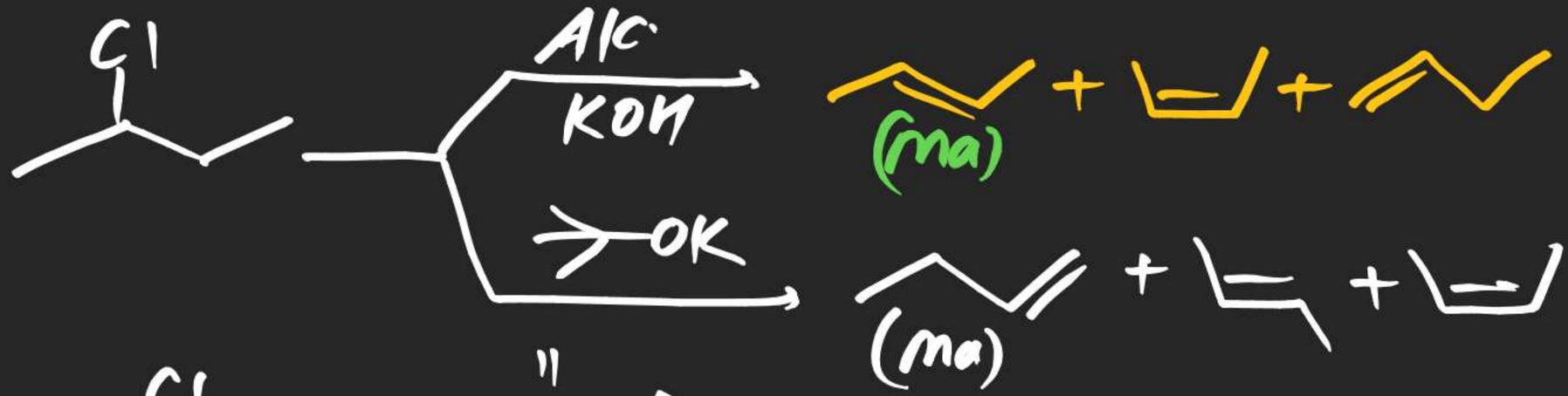
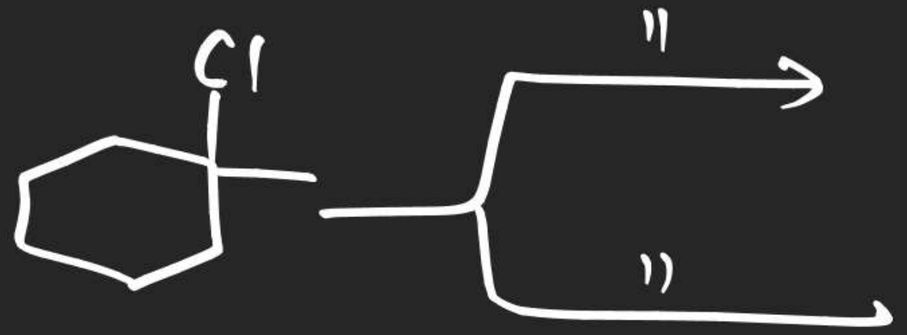
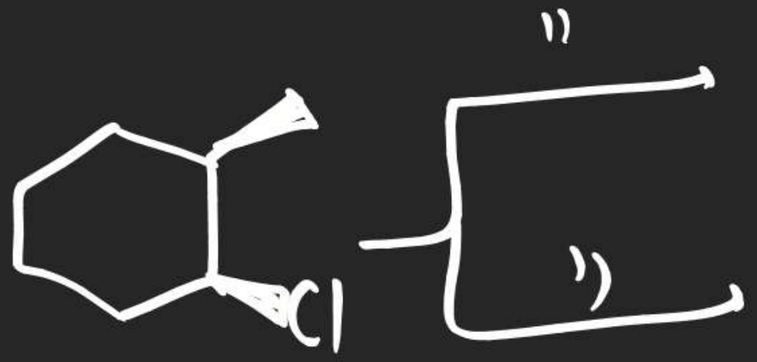
(28)



(29)



(30)



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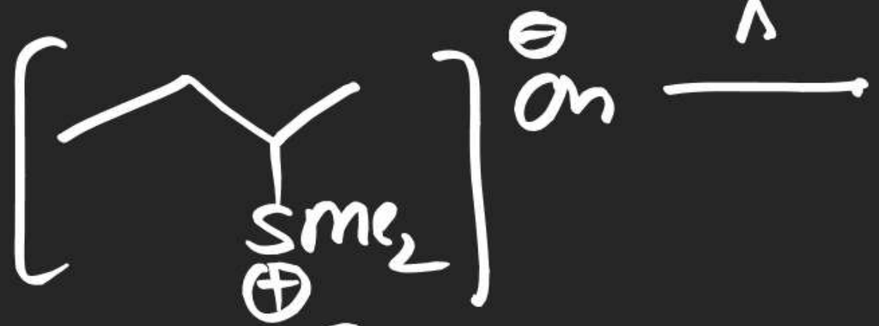
(31) 

Leaving Group	Sytzeff	Hofmann
$-I$ (E_2)	84%	16%
$-Br$ (E_2)	76%	24%
$-Cl$ (E_2)	65%	35%
$-F$ (E_{2a})	22%	78%

Note:- If leaving group is poor & having strong $-I$ effect then it dominates hofmann alkene as a major product due to (E_{2a})

like $(-F, -\overset{\oplus}{N}R_3, -\overset{\oplus}{S}R_2 \cdots)$

(32) 

(33) 

(34) (a) 

(b) 

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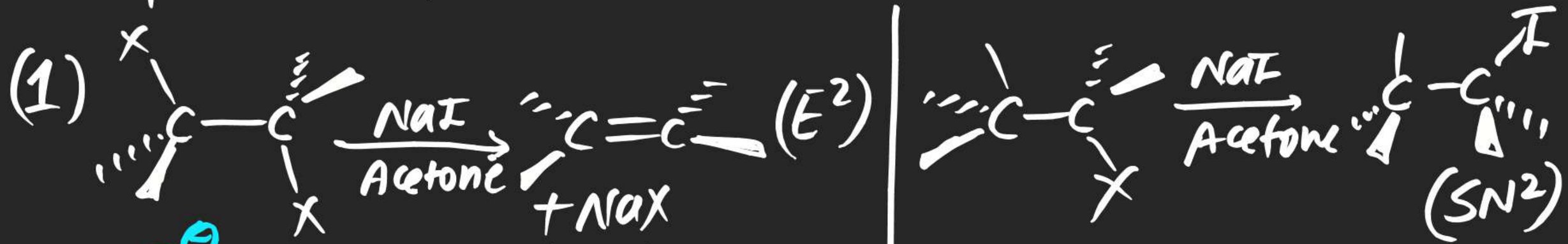
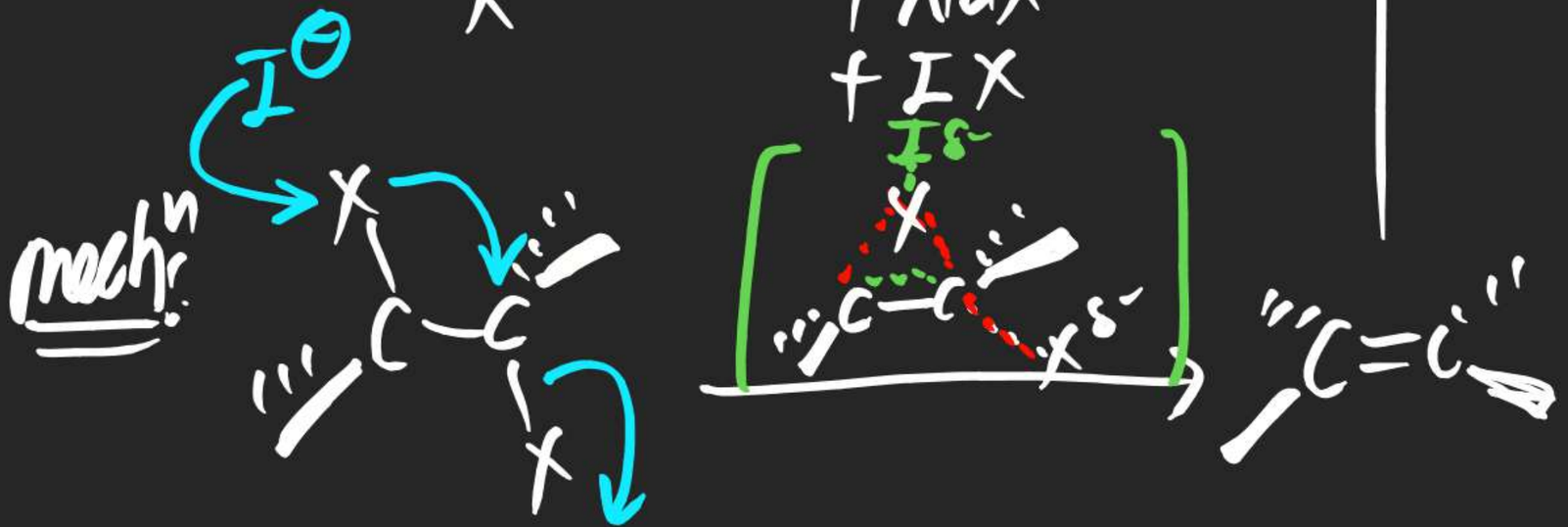
(#) Dehalogenation :

$\Rightarrow$ In This Reaction vic-dihalide Compounds are treated with NaI-Acetone or Zn-Dust so that dehalogenation takes place & alkene is obtained as a Product.

(1) 

Mechⁿ :

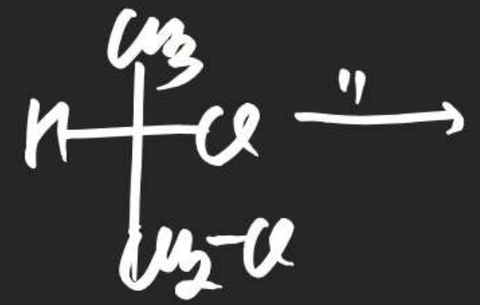


Note (i) Anti Elimination

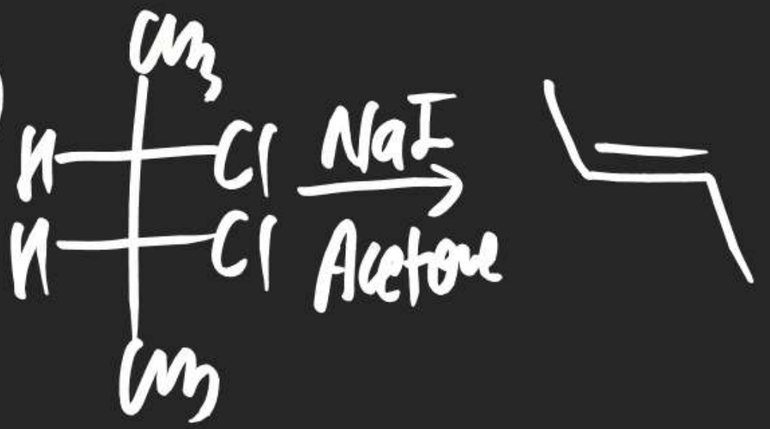
(ii) order of rate of rxn

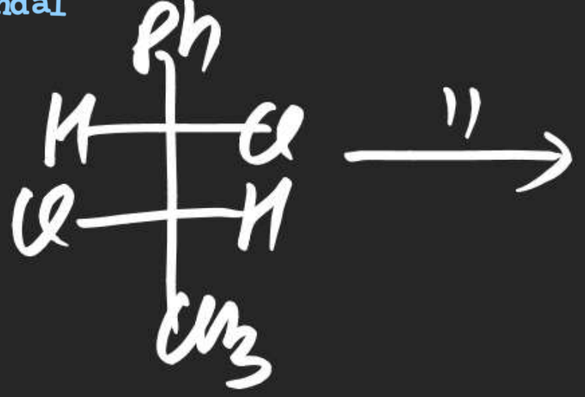
(2) $CH_2Cl-CH_2Cl \xrightarrow[\text{Acetone}]{NaI}$

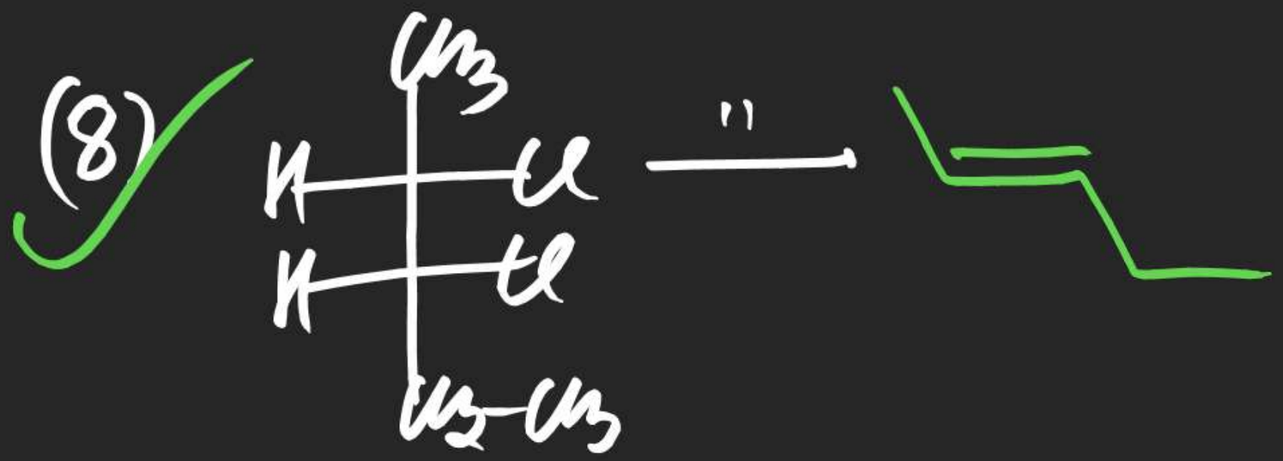
(3) $CH_3-\underset{Cl}{CH}-\underset{Cl}{CH_2} \longrightarrow$

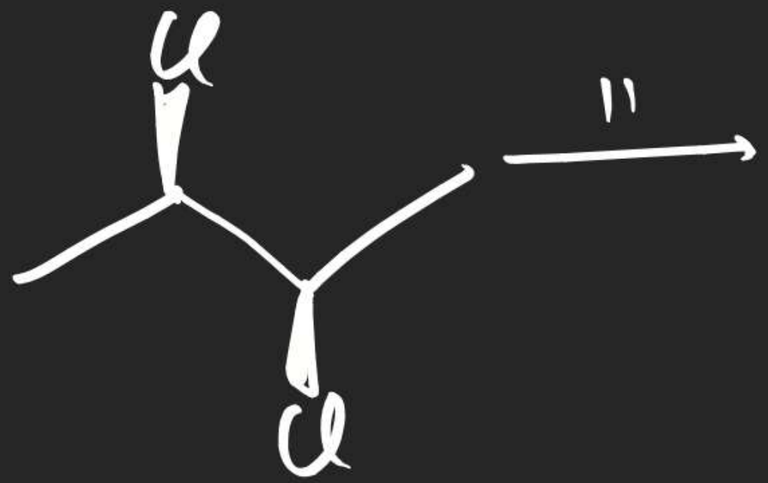
(4) 

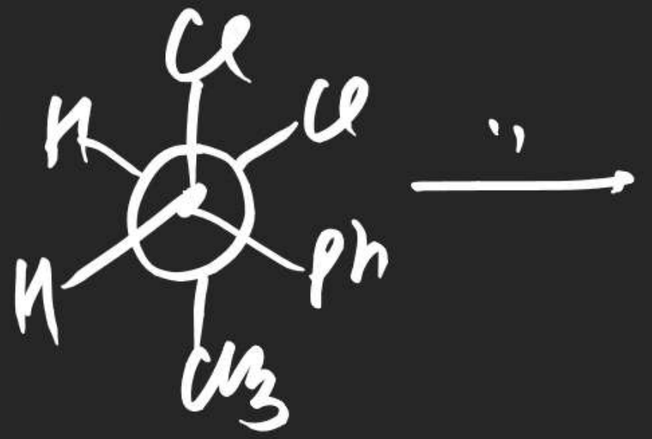
(5) 

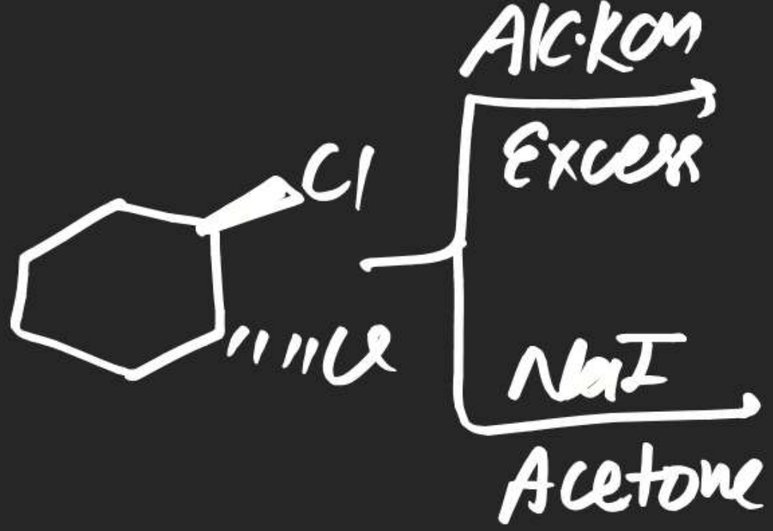
(6) 

(7) 

(8) 

(9) 

(10) 

(11) 

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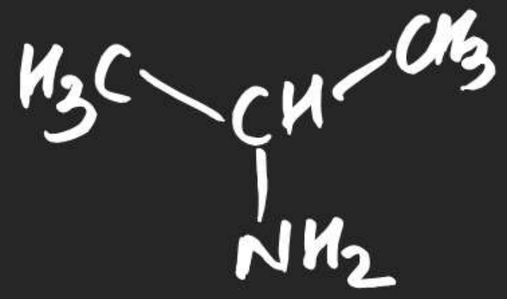
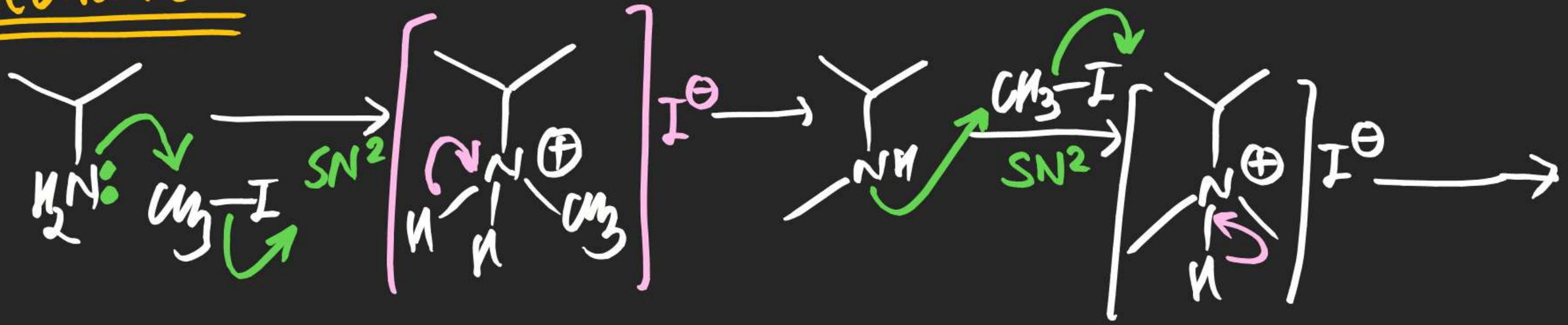
(#) Hofmann Exhaustive Ellimination :

(1) 

(i) CH_3-I (Excess)
(ii) moist Ag_2O
(iii) Δ

Mechanism



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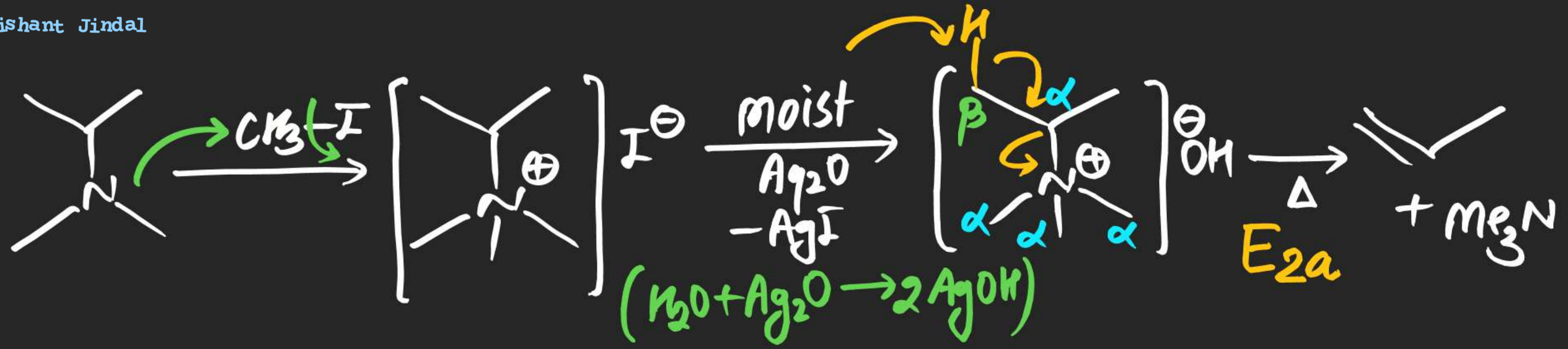
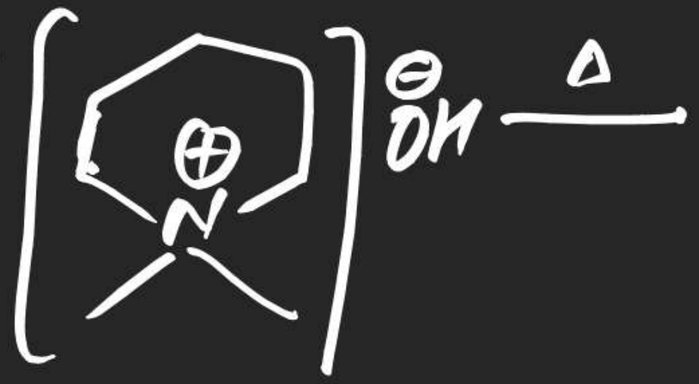
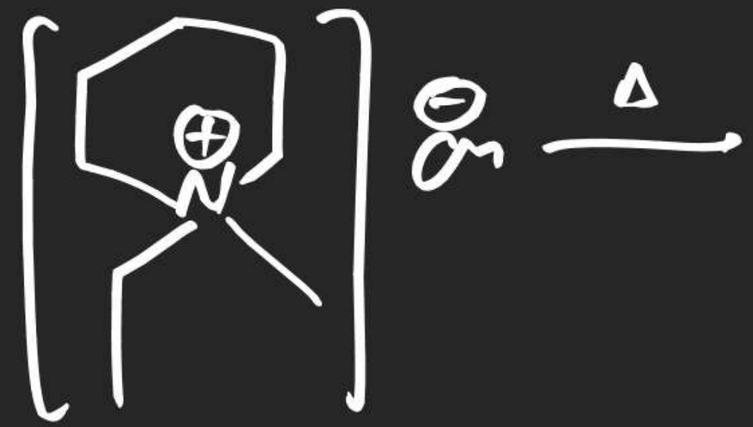


(2)

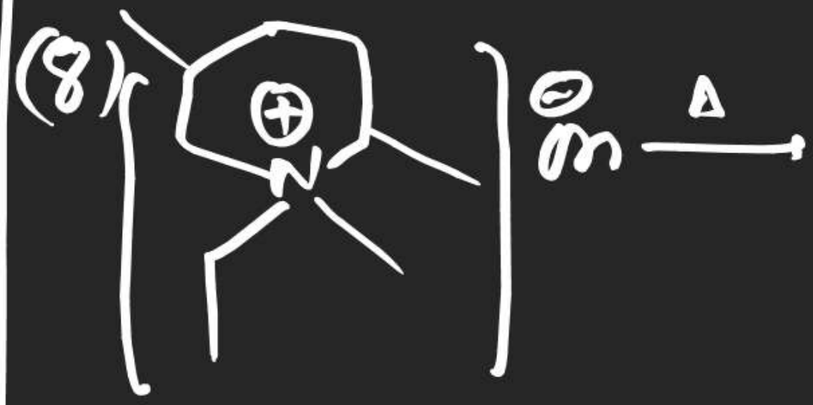
(3)

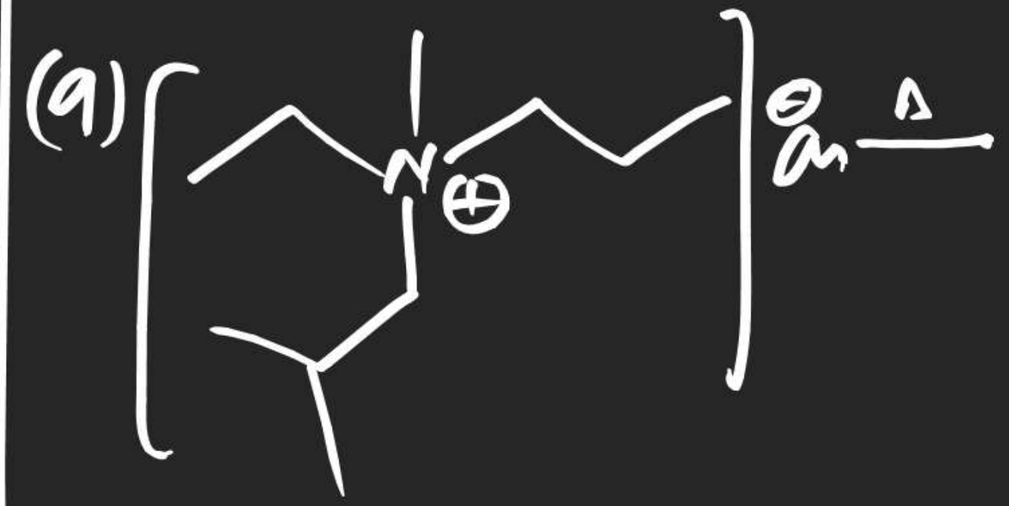
(4)

(5) 

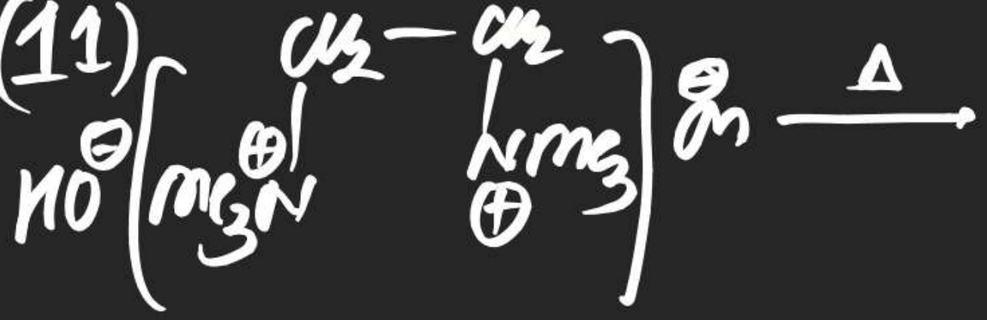
(6) 

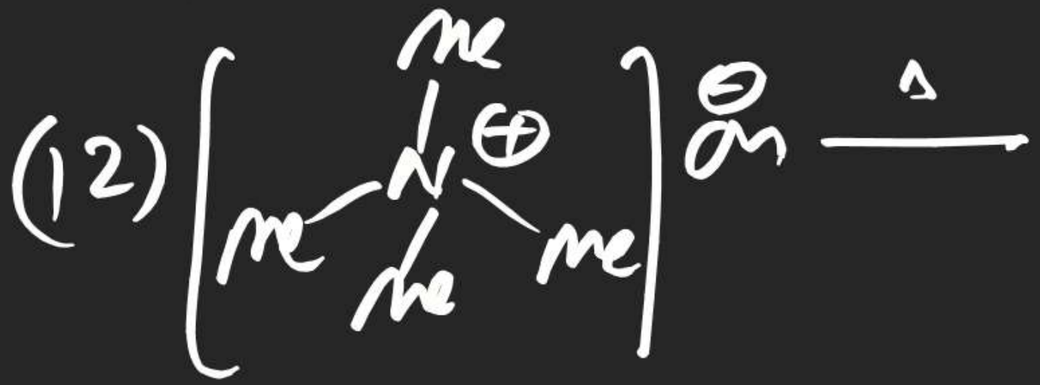
(7) 

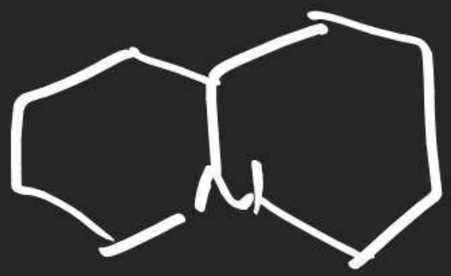
(8) 

(9) 

(10) 

(11) 

(12) 

(13) 

(14) 

$\xrightarrow[2Cl]{CH_3-I}$ P $\xrightarrow[Ag_2O]{moist}$ Q $\xrightarrow{\Delta}$ R $\xrightarrow{CH_3-I}$ S $\xrightarrow[Ag_2O]{moist}$ T $\xrightarrow{\Delta}$ U (+V)

(15) 

(16) 

(#) Application of E^1 :

(1) Dehydration of Alcohol:

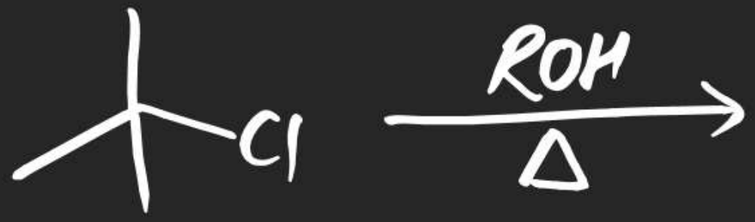
(1) 

(2) 

(3) 

(2) Elimination of alkyl halide

S_N1 E^1

(4) 

(5) 

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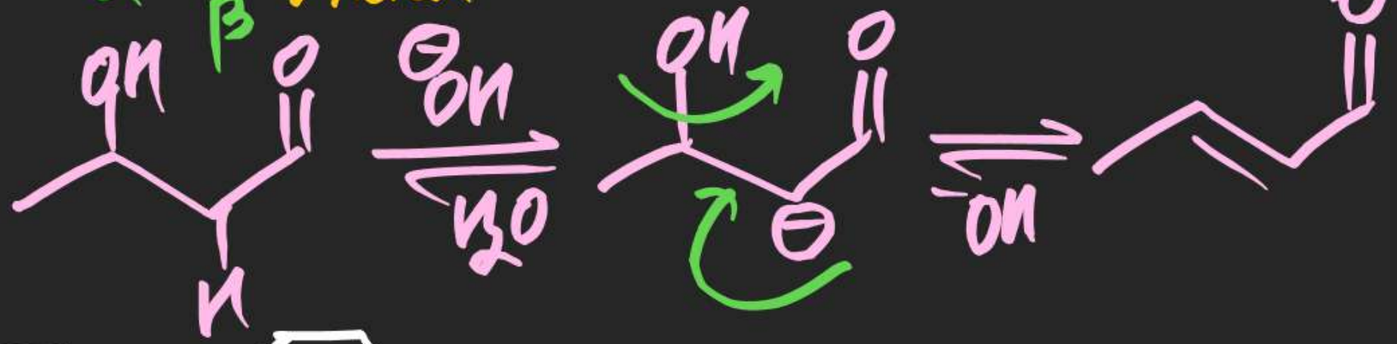
Application of E^{1}CB :-

Bad lg

(1)

mechⁿ :-



(2)

(3)

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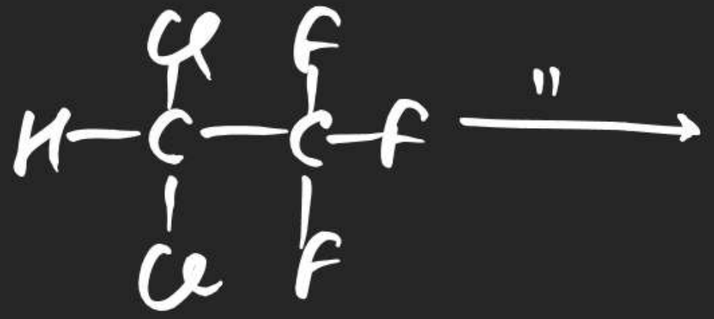
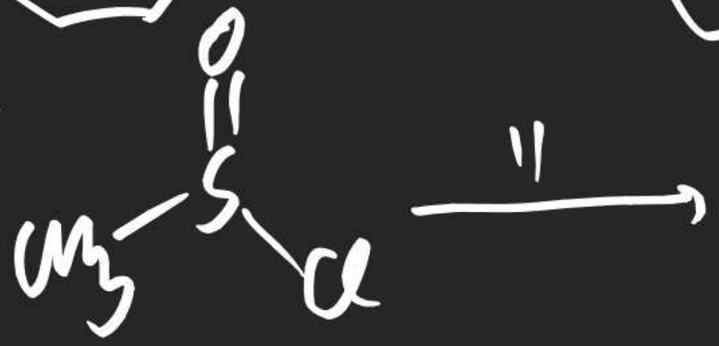
(4) 

(5) 

(6) 

(7) 

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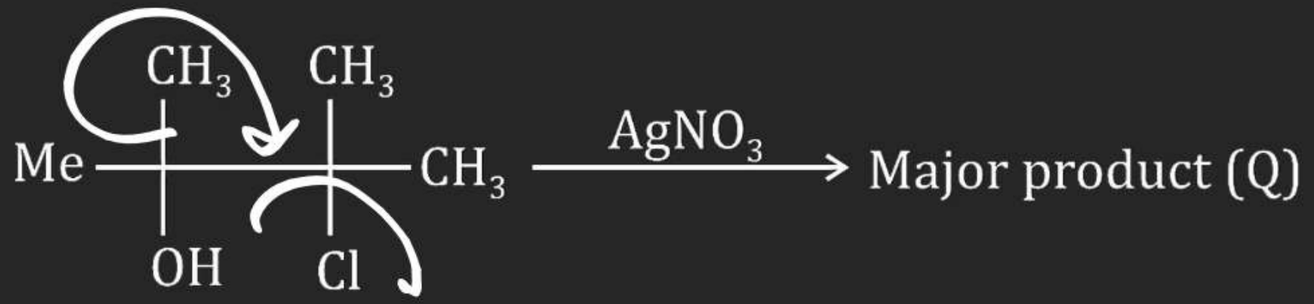
E^{i} Mechanism :-

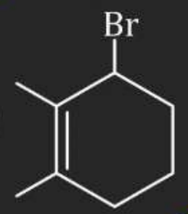
37. In the given Reaction sequence major product (Q) is: -



(A) Ketone (B) Aldehyde (C) Acid (D) Alkene

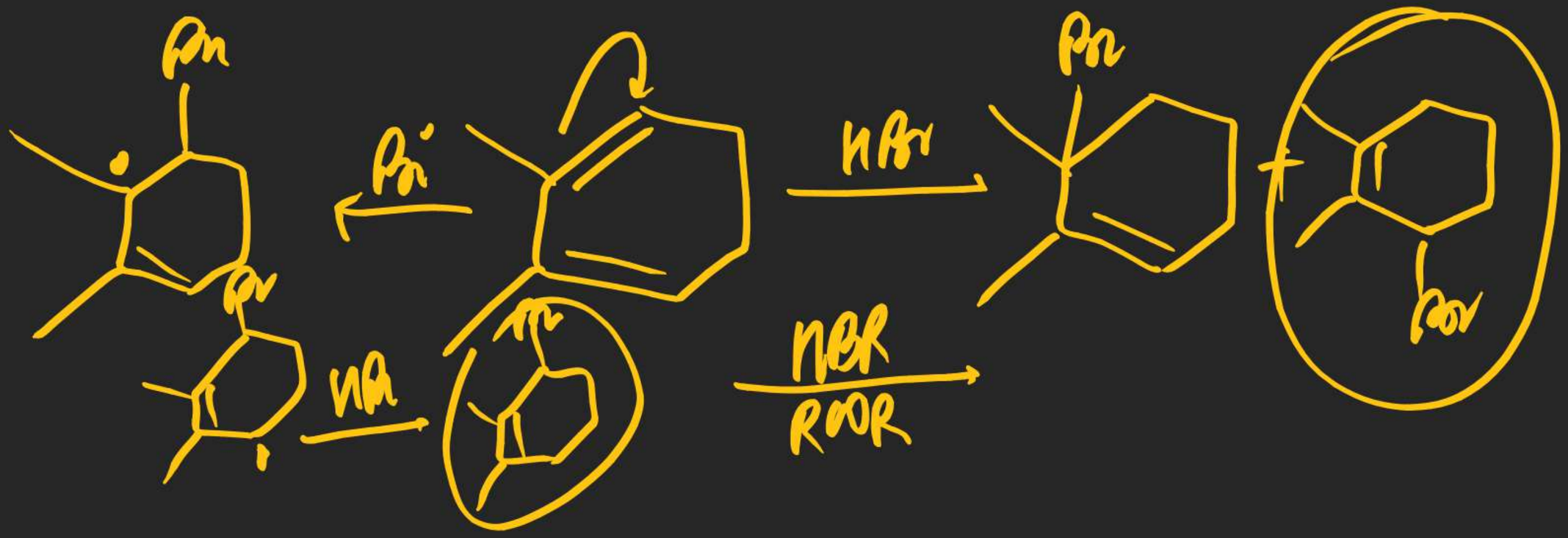
38. Addition of HBr to 2, 3-dimethyl-1, 3-cyclohexadiene may occur in the absence or presence of peroxides. In each case two isomeric $C_8H_{13}Br$ products are obtained. Which of the following is a common product from both reactions

(A) 

(B) 

(C) 

(D) 



43. Total number of following combinations of axial & equatorial bonds show Cis orientation in Dimethyl cyclohexane.

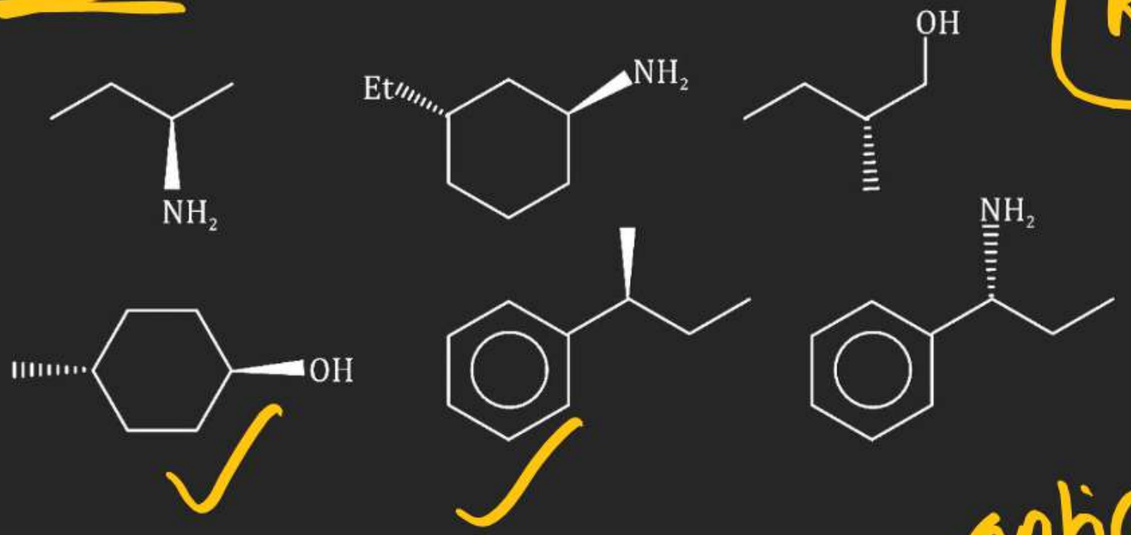
(i) 1e, 2e Trans (ii) 1e, 3e Cis (iii) 1e, 4e Trans (iv) 1e, 2a Cis

(v) 1e, 3a (vi) 1e, 4a (vii) 1a, 3a

a → axial
e → equatorial

44. Total number of compounds which can not be convert racemic mixture of carboxylic acid into diastereomeric mixture

Resolution



optically & chemically Active

49. Select correct statements out of following:

(A) Twist boat form of the cyclohexane is optically active C

(B) Aniline have five equivalent resonating structures I

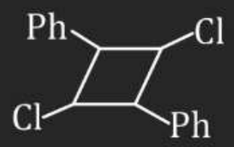
(C) $CH_3 - \overset{+}{C}H - CH = CH_2$ and $\overset{+}{C}H_2 - CH_2 - CH = CH_2$ are resonating structures I

(D)  have five equivalent resonating structures C

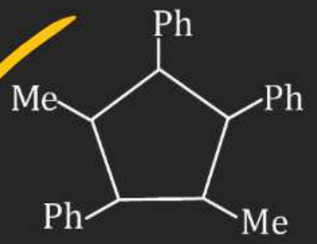
50. The compound having at least one optically active Isomers is/are:-

(A) 

I

(B) 

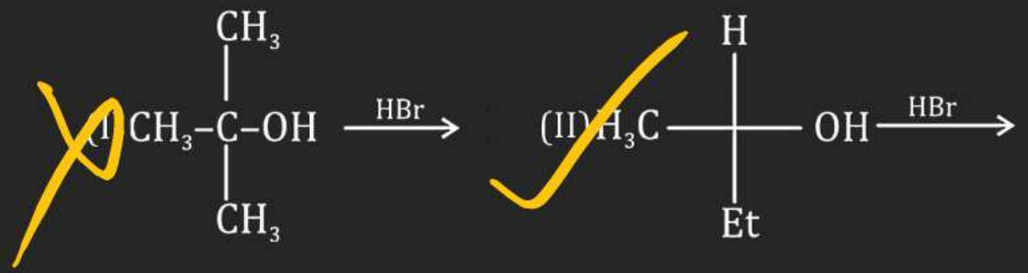
I

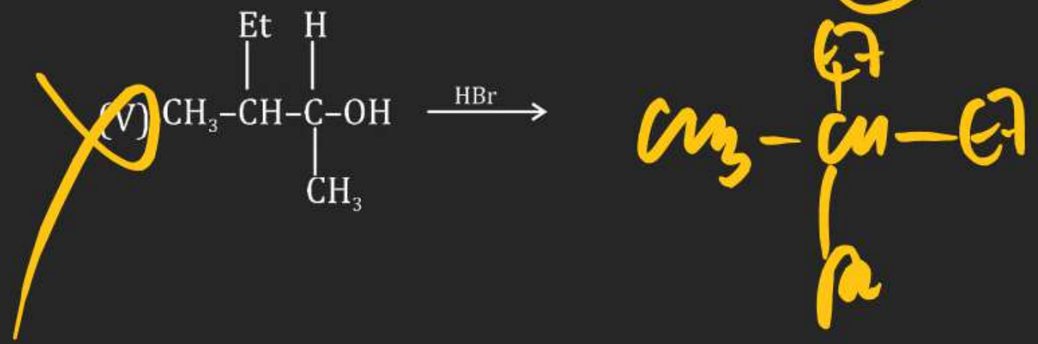
(C) 

(D) 

I

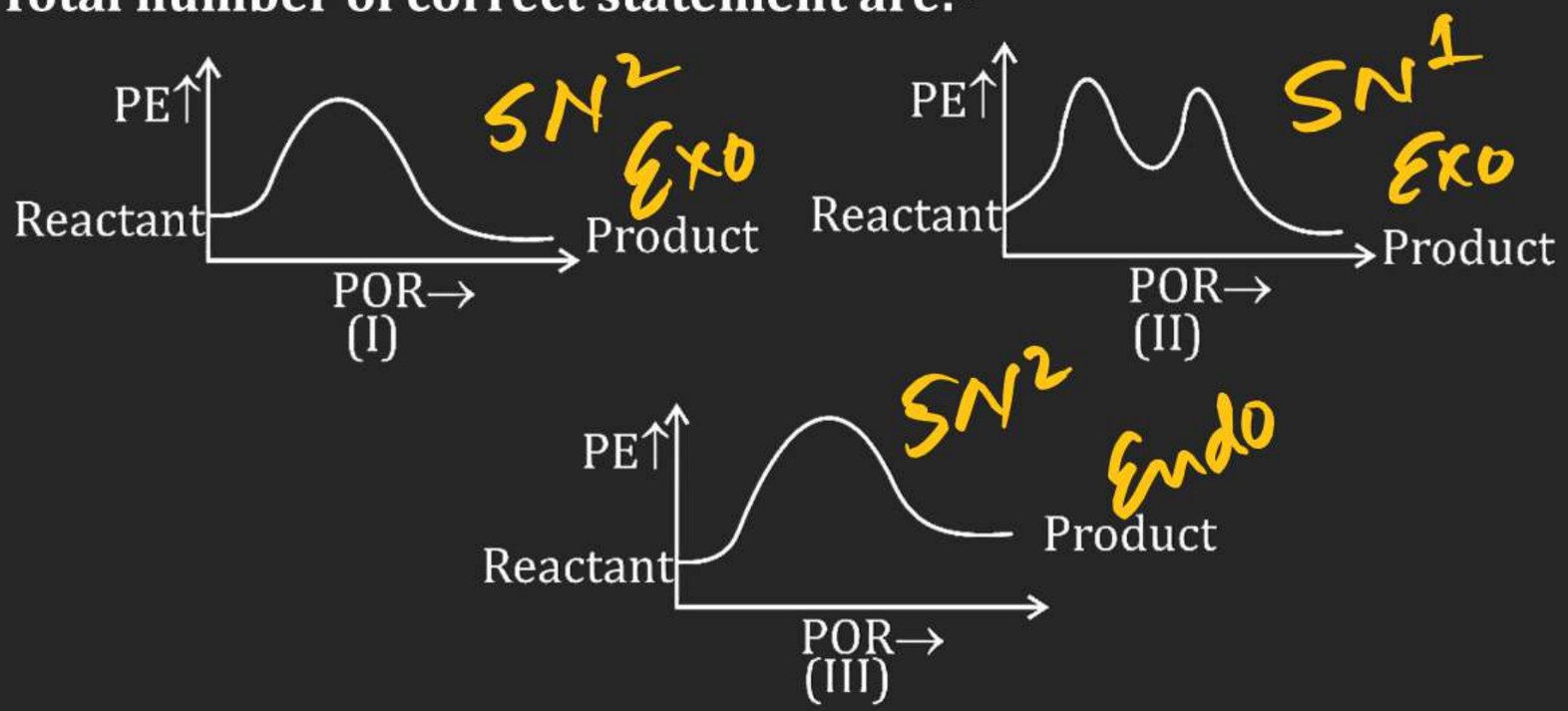
52. Total number of reactions which can given (d) & (λ) from as major product.





53. **Following are the curves for nucleophilic substitution reaction.**

Total number of correct statement are:-



(a) 'I' is potential energy diagram for S_N2 reaction are that takes place with negative potential energy change.

(b) 'II' is potential energy diagram for S_N1 reaction in which $II n_m^{nd}$ transition state is rate determine step.