Ex! Complete following & Predict Keq

(1)  $K_{eq} = 1$

(2) 

less stable ⇌ more stable ($K_{eq} > 1$)

(3) 

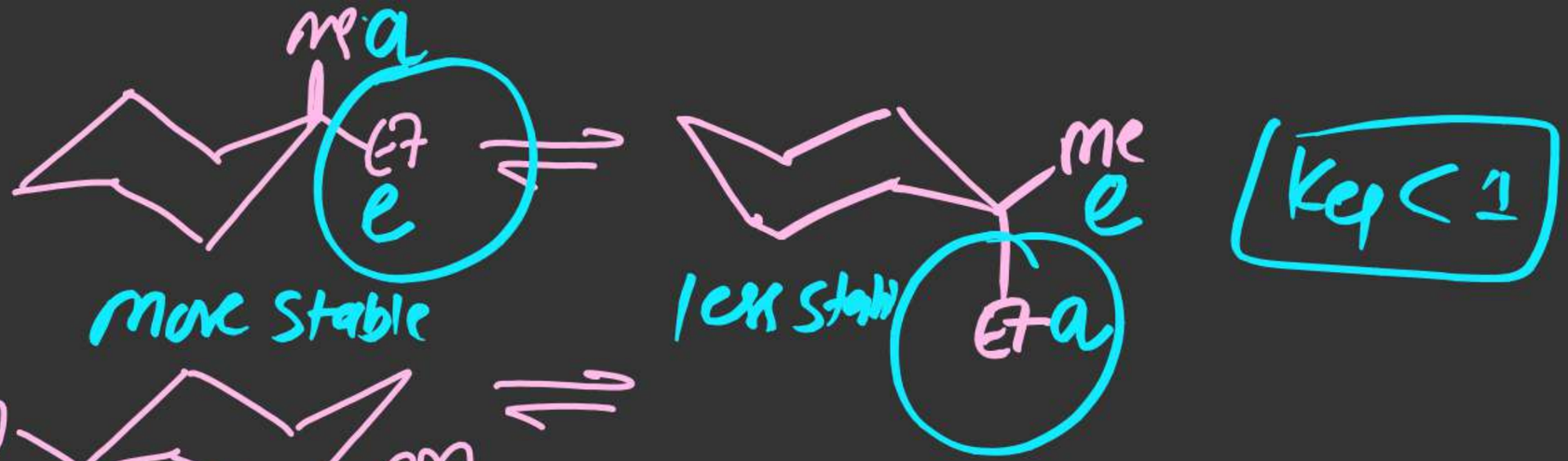
($K_{eq} = 1$)

(4) 

(aa) ⇌ (ee)

$K_{eq} > 1$

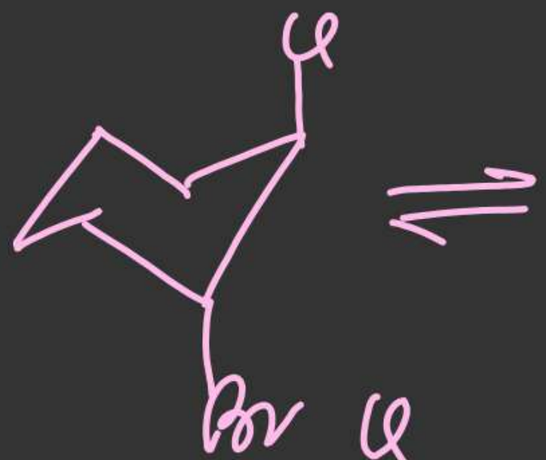
(5)



$K_{eq} < 1$

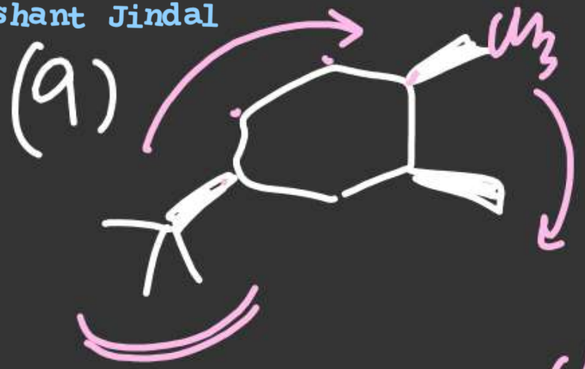
(6)

(7)

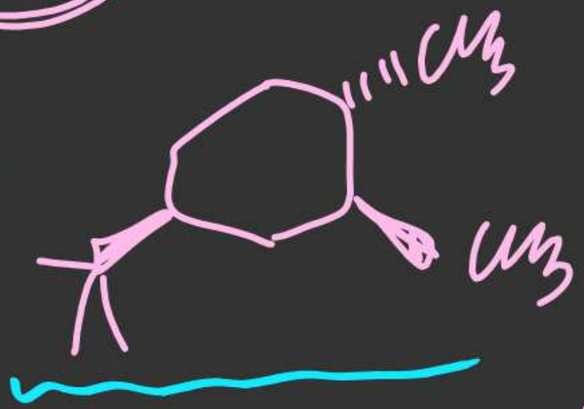


(8)

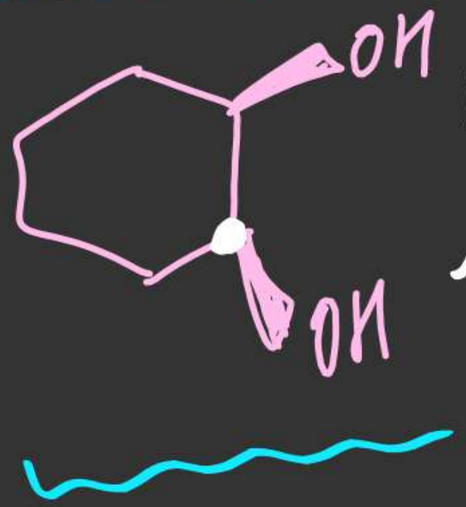
(9)

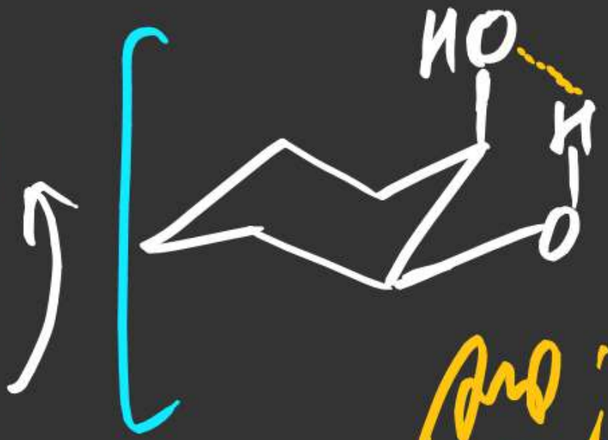


(10)



(11)





Ans :

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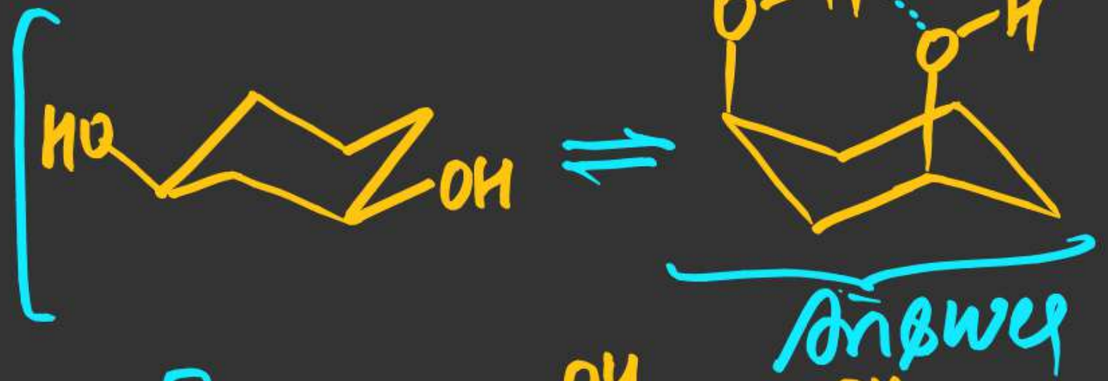
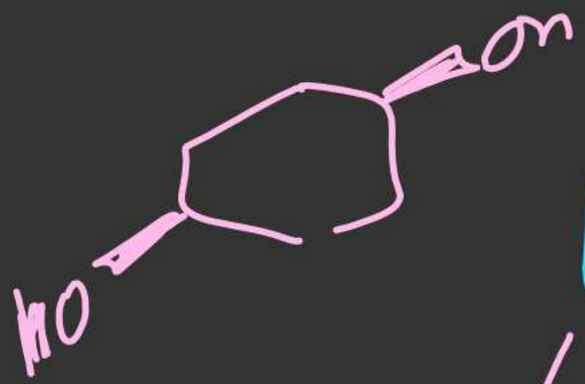
(12)



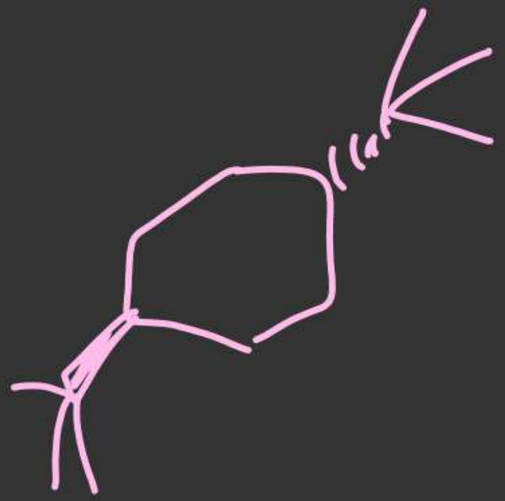
Answer

(13)



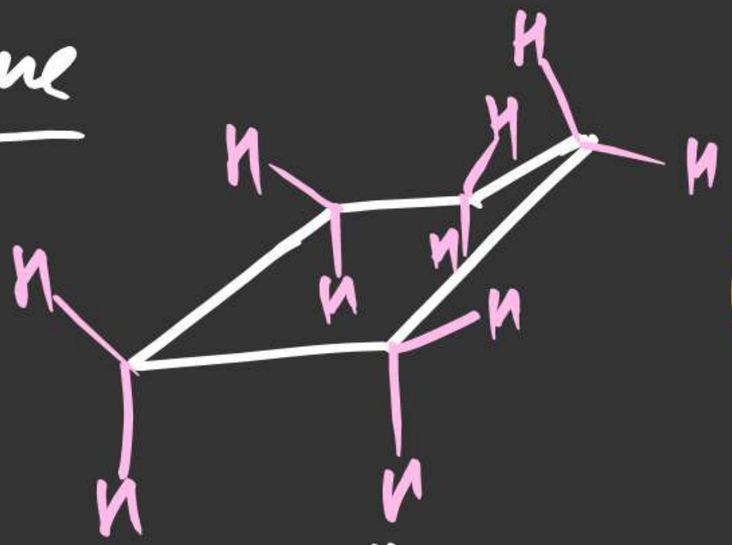
"Answer"

(14)



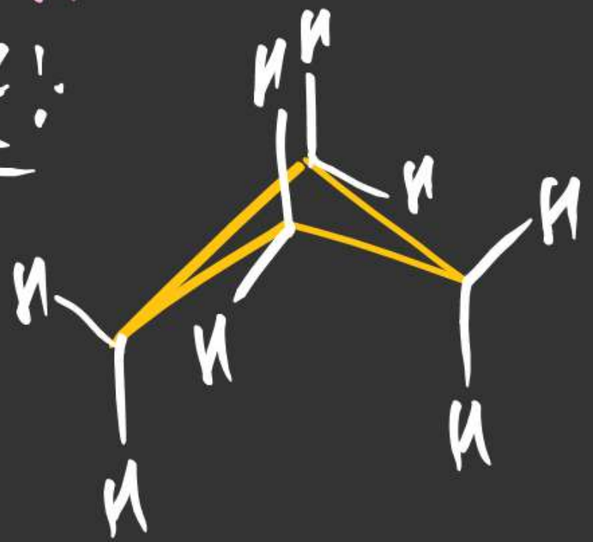
(21) 1-Ethyl-2-methyl cyclohexane

Conformation of Cyclopentane



(Envelope Conformation)

Conformation of cyclobutane :



(B·fly Conformation)

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Reaction mechⁿ

First 6 lecture (No Previous Concept is Req)

Optical Requirm

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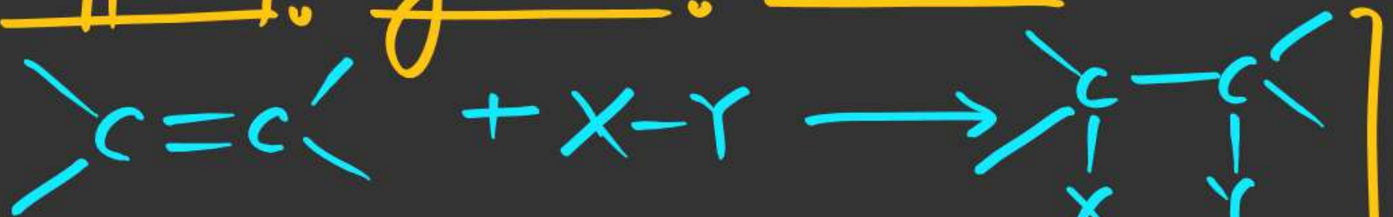
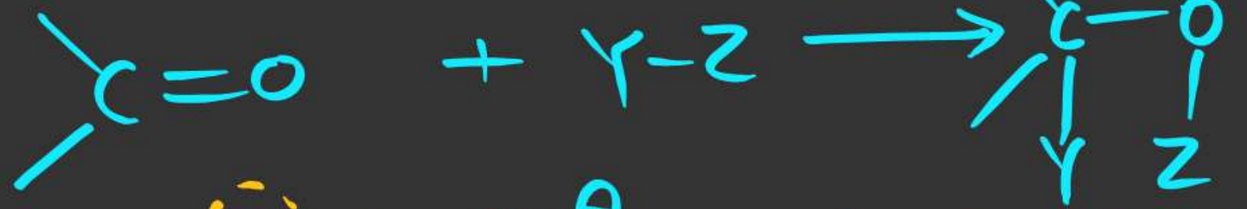
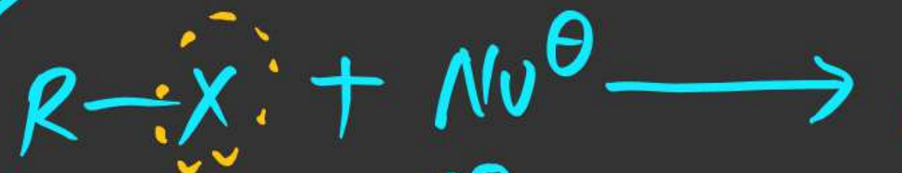
Organic Reaction Mechanism (ORM)

(#) Type of Organic Reactions :

(a) 

(b) 

] Addⁿ Reaction

(c) 

] Substitution Reaction

(d) 

] Elimination Rxⁿ

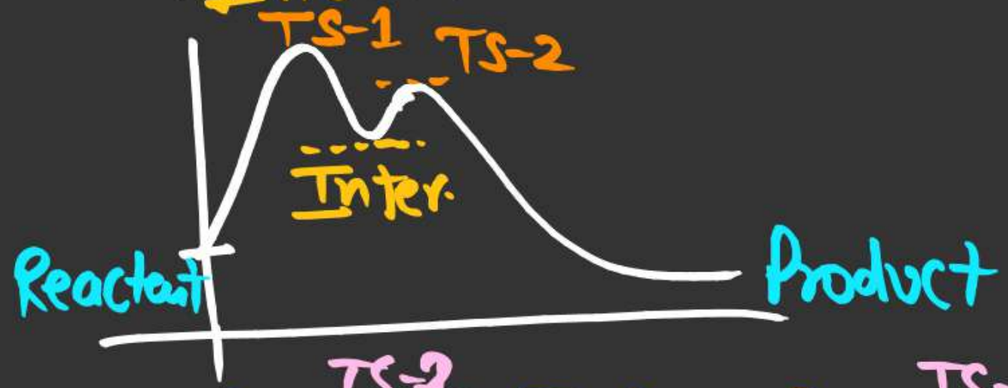
(e) 

] Rearrangement Rxⁿ

(#)

(i) Reactant $\xrightarrow{\text{Transition state (TS)}}$ Product } Simple step rxn, No intermidiate involved

(ii) Reactant $\xrightarrow{TS\text{-}1}$ Intermidiate $\xrightarrow{TS\text{-}2}$ Product } Two step rxn, Intermidiate inv.



(ii) Reactant $\xrightarrow{TS\text{-}1}$ Intermidiat $\xrightarrow{TS\text{-}2}$ Intermidiate $\xrightarrow{TS\text{-}3}$ Product } Three step rxn, Int. involv.

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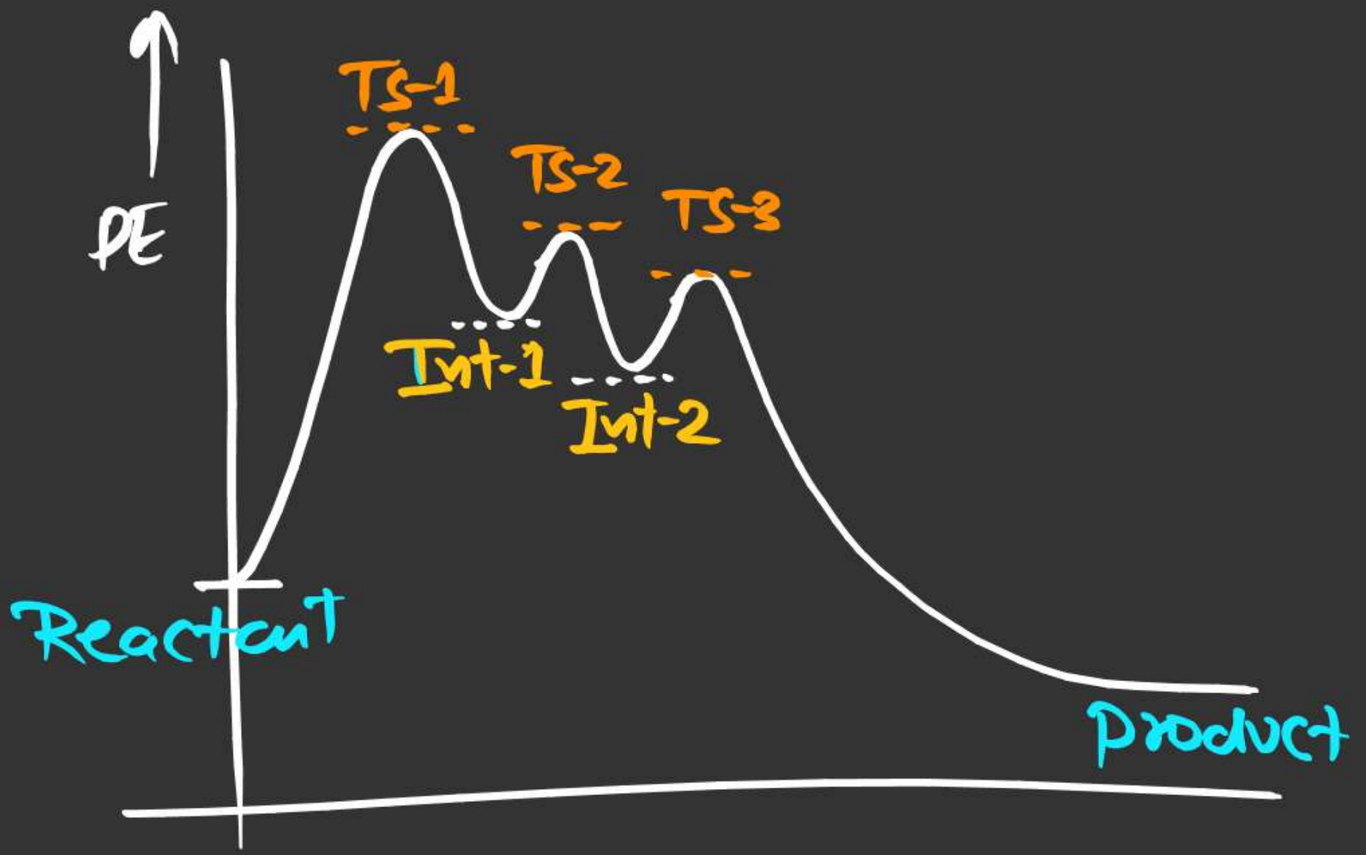

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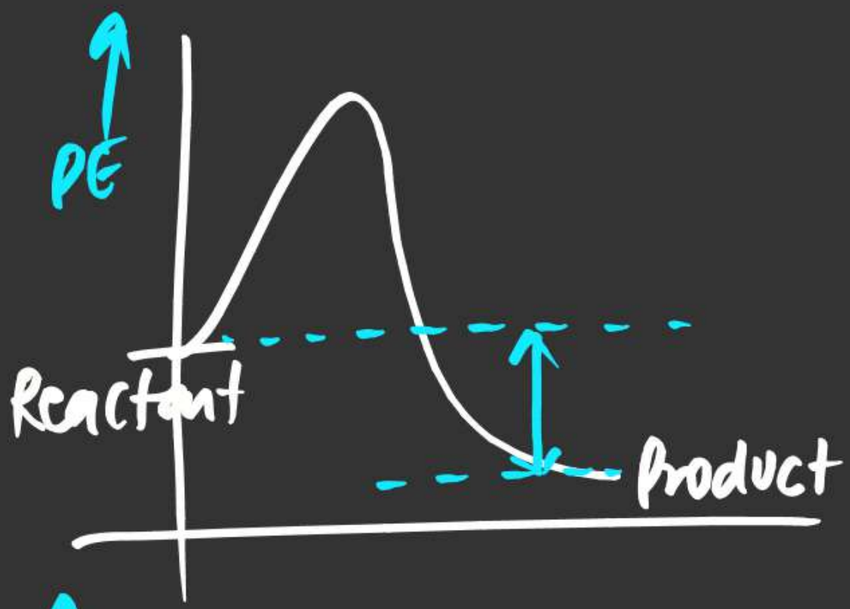
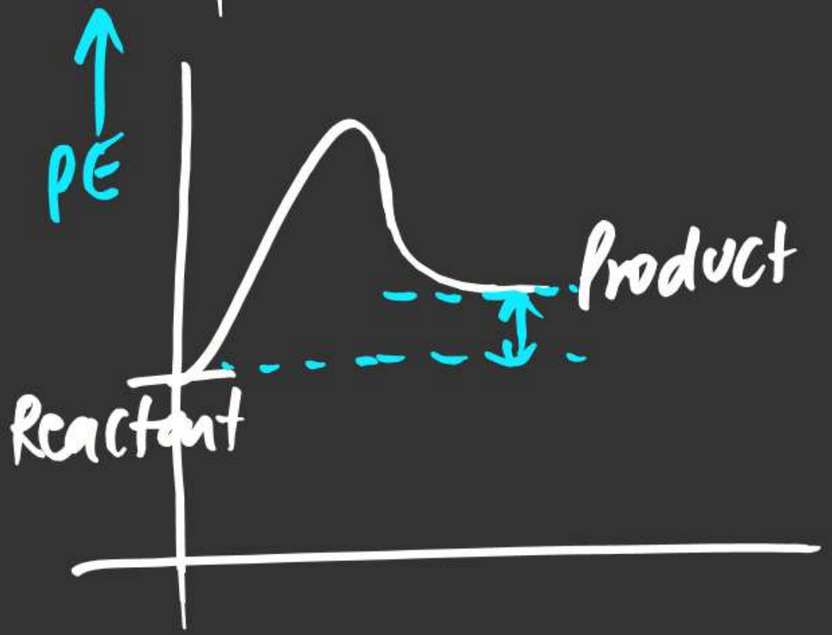
(#) Exothermic Reaction ($\Delta H < 0$)

Reaction in which net heat is evolved.



(#) Endothermic Rxn ($\Delta H > 0$)

Reaction in which net heat is reqd.



(#) Attacking Reagents :-

There are two type of attacking Reagents.

(i) Electrophiles / Electrophilic Reagent :-

⇒ Electro + philic

⇒ Electron loving specise.

⇒ Electron deficient specise.

⇒ Electron acceptor

⇒ must have vO (Vacant orbital)
or may be vacant during approch.

(i) Positive Electrophile & Incomplete octet :-

⇒ Electrophiles having positive charge

Ex: H^+, D^+, T^+, $Cl^{\oplus}$, $Br^{\oplus}$, $I^{\oplus}$, $NO^{\oplus}$, $NO_2^{\oplus}$, $CH_3^{\oplus}$, $CH_2-CH_3^{\oplus}$ ... etc

(ii) Neutral Electrophile & Incomplete octet

⇒ Electrophiles without charge.

Ex: $AlCl_3$, BF_3, BCl_3, - - - - etc.

(iii) Complete Octet Electrophiles

⇒ Electrophiles with Complete octet.

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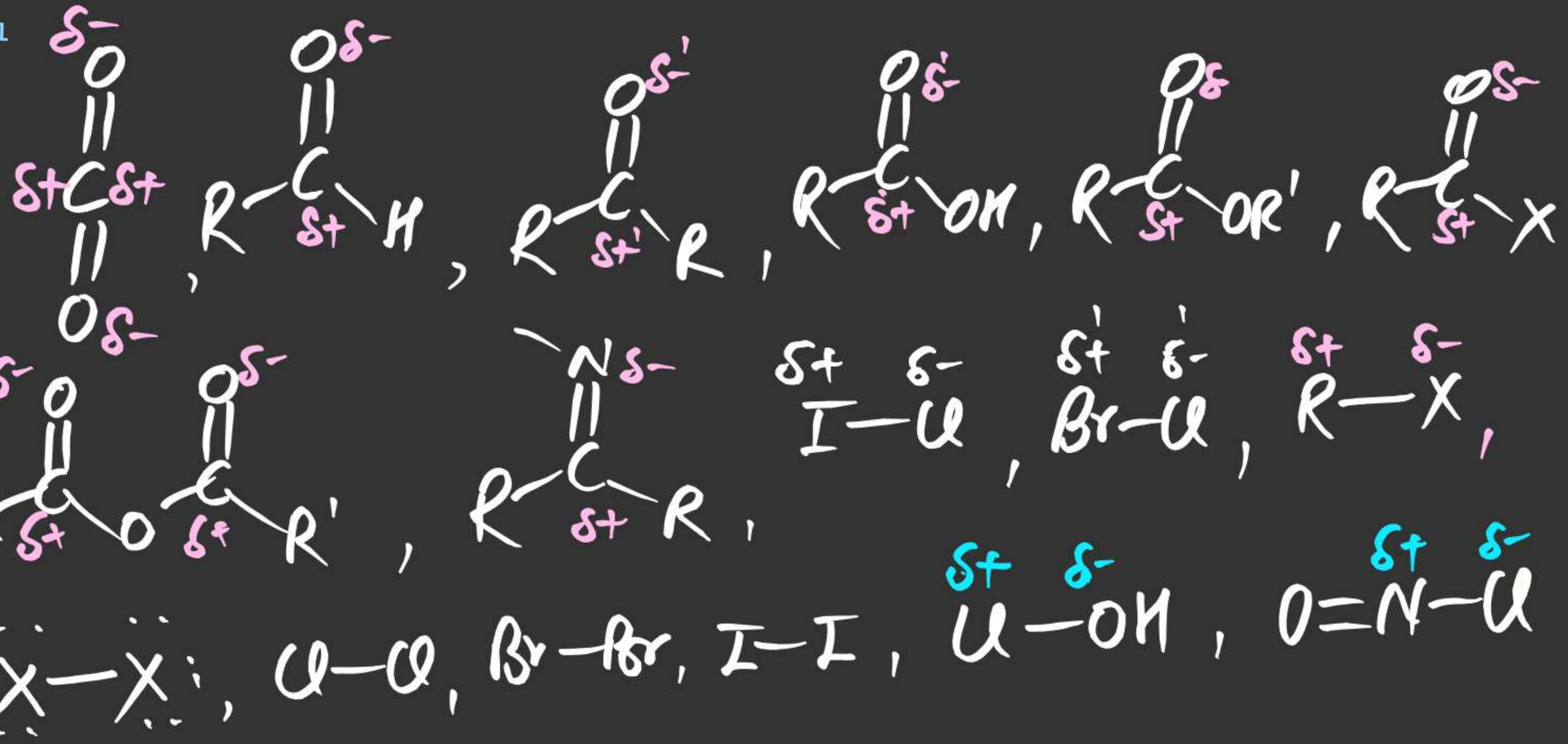
Ex!



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(#) Nucleophiles / Nucleophilic Reagents :-

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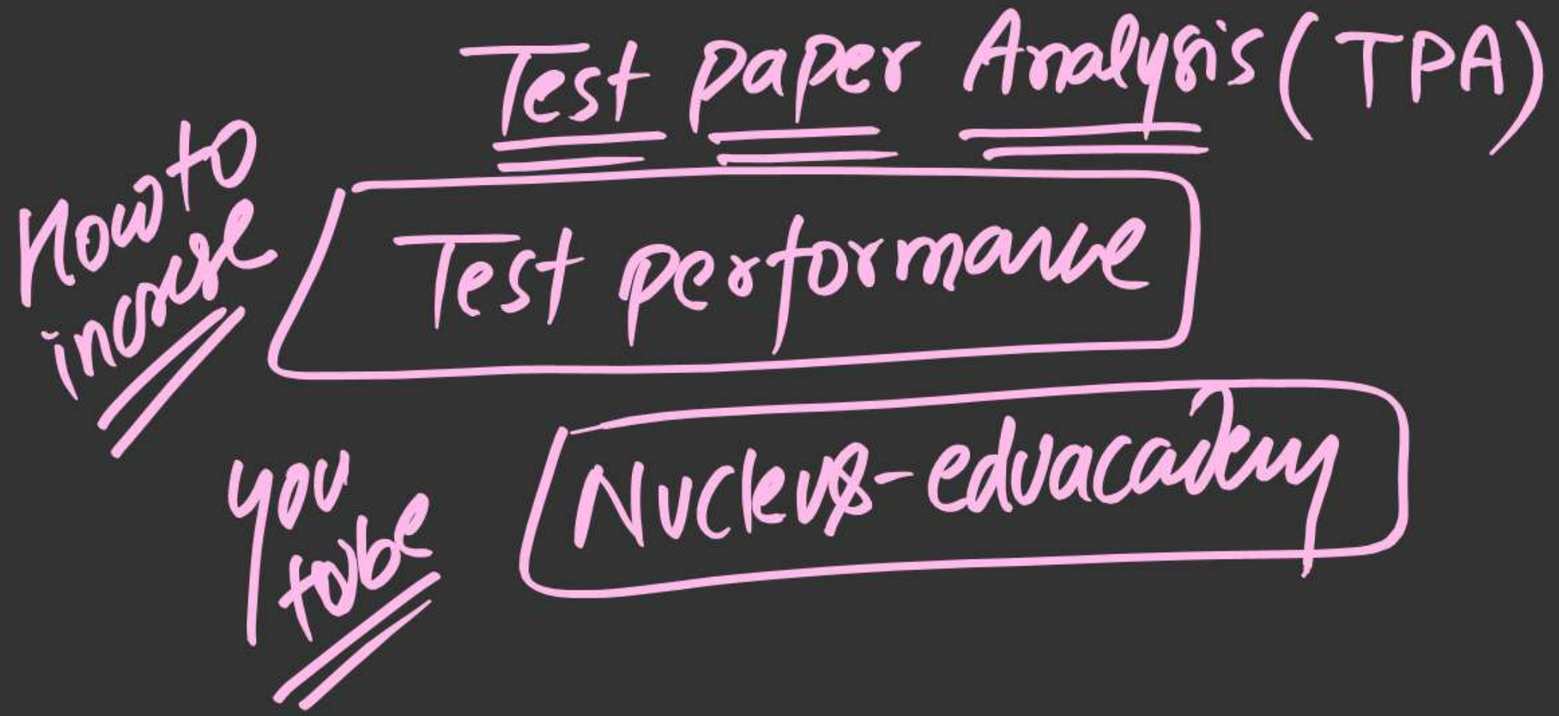
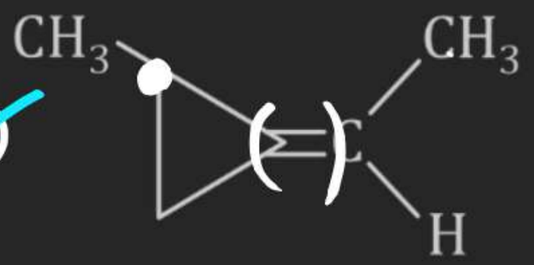
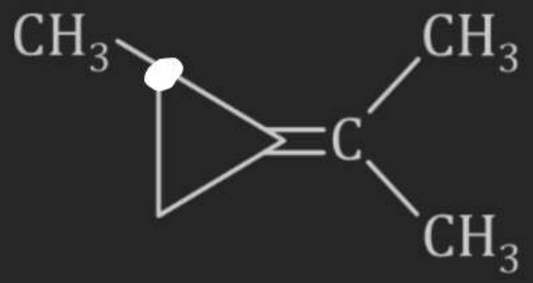


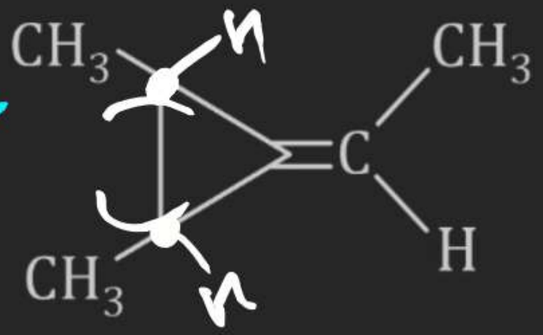
3. Which of the following will show optical isomerism as well as geometrical isomerism

(A) 

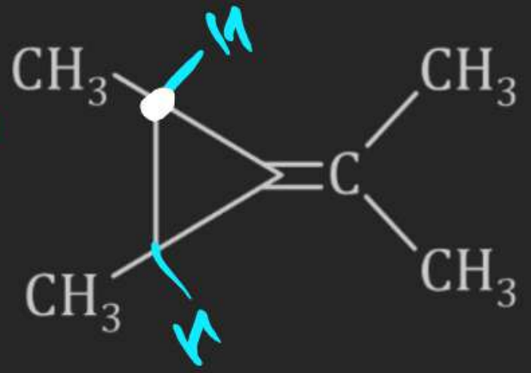
OI ✓ GI ✓

(B) 

OI ✓ GI ✗

(C) 

✓ ✓

(D) 

✓ ✓

Ring across

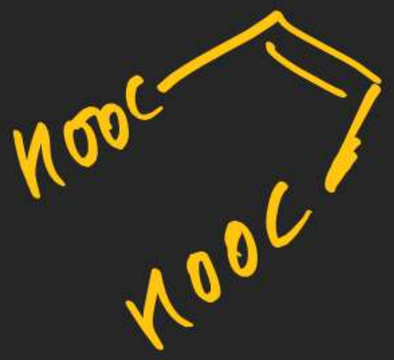
6. Which of the following have zero dipole moment?

(A) p-Dichlorobenzene $\mu = 0$

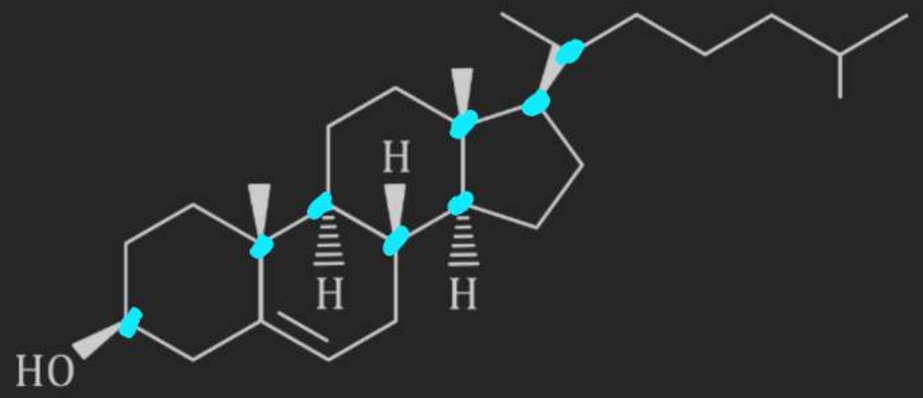
(B) Benzene-1, 4-diol $\mu \neq 0$

(C) lactic acid $\mu \neq 0$

(D) Maleic acid $\mu \neq 0$



10. find a+b for following compound if a is total no. of chiral centre in cholesterol & b is total possible stereoisomers for cholesterol



Cholesterol

$a = 8$

$b = 2^8$

$a + b = 8 + 2^8$

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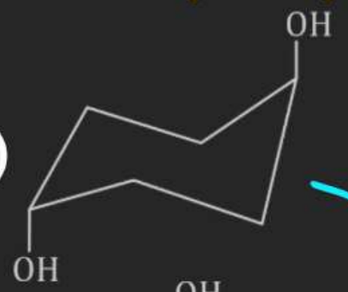
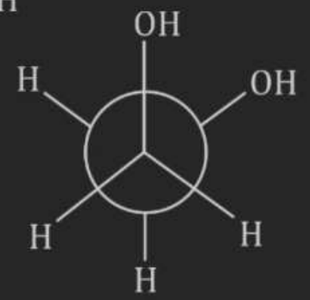
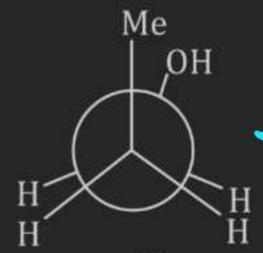
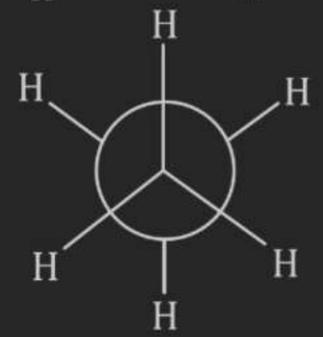
15. Match the column:

Column I (Compound)	Column II (Statement)
(P) 	(1) Conformation of maximum torsional strain
(Q) 	(2) Conformation with strong intramolecular hydrogen bond
(R) 	(3) Highest boiling point]
(S) 	(4) Conformation of minimum Vander Waal strain

Options :

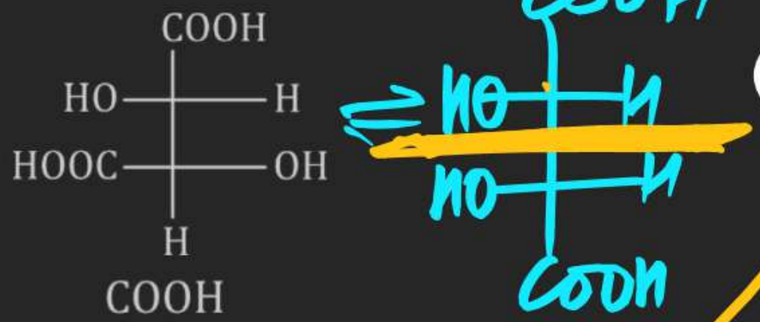
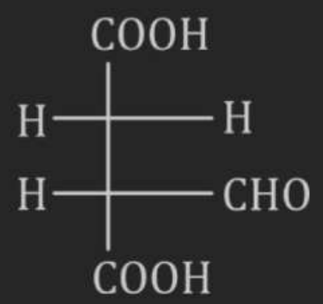
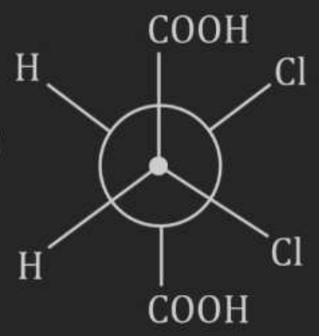
(A) $P \rightarrow 2,\ Q \rightarrow 3, R \rightarrow 1, S \rightarrow 4$

(B) $P \rightarrow 3,\ Q \rightarrow 2, R \rightarrow 1, S \rightarrow 4$

(C) $P \rightarrow 3,\ Q \rightarrow 2, R \rightarrow 4, S \rightarrow 1$

(D) $P \rightarrow 3,\ Q \rightarrow 1, R \rightarrow 2, S \rightarrow 4$

17. Match the column :

Column I (Compound)	Column II (Statement)
(1) 	(P) Chiral compound
(2) 	(Q) Having even no. of chiral centre
(2) 	(R) Meso compound
(2) 	(S) All stereoisomers are chiral

Options :

(A) $1 \rightarrow R, S\ 2 \rightarrow Q, S\ 3 \rightarrow P, S\ 4 \rightarrow R, Q$

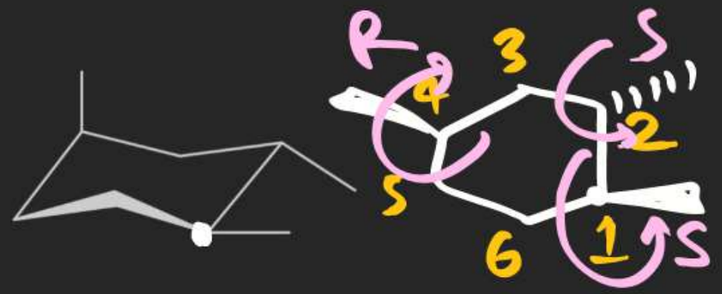
(B) $1 \rightarrow R, Q\ 2 \rightarrow P, R\ 3 \rightarrow R, S\ 4 \rightarrow Q, P$

(C) $1 \rightarrow P, R\ 2 \rightarrow R, S\ 3 \rightarrow Q, S\ 4 \rightarrow R, P$

(D) $1 \rightarrow Q, R\ 2 \rightarrow P, S\ 3 \rightarrow P, Q\ 4 \rightarrow P, S$

3. Which of the following structures represents the lowest-energy form of (1S, 2 S, 4R)-trimethyl -cyclohexane?

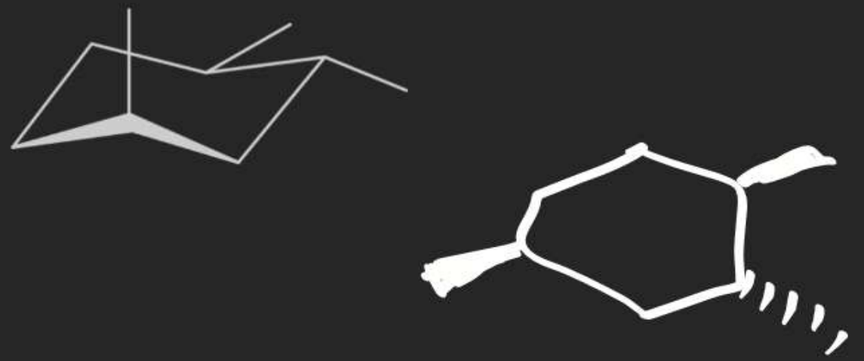
(A)



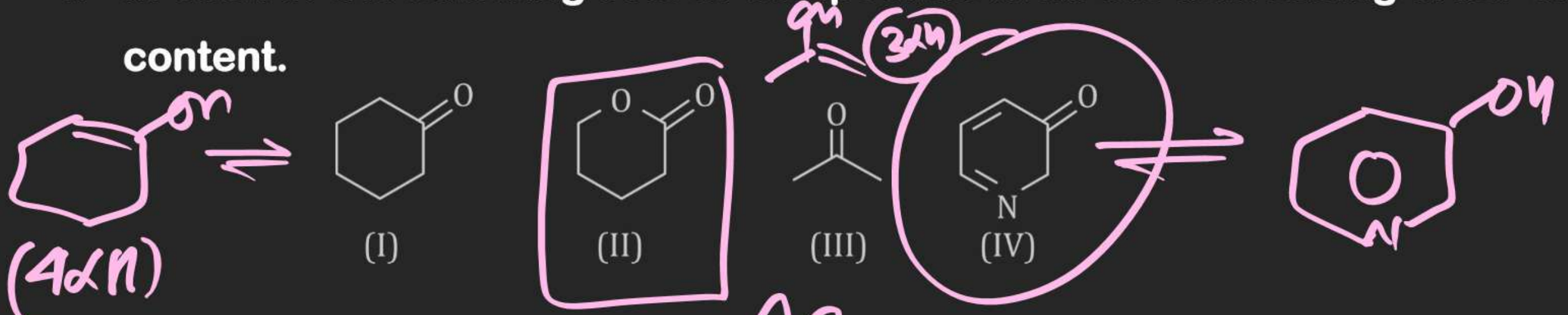
(B)

(C)

(C)



4. In each of the following sets of compounds write the decreasing order of % enol content.



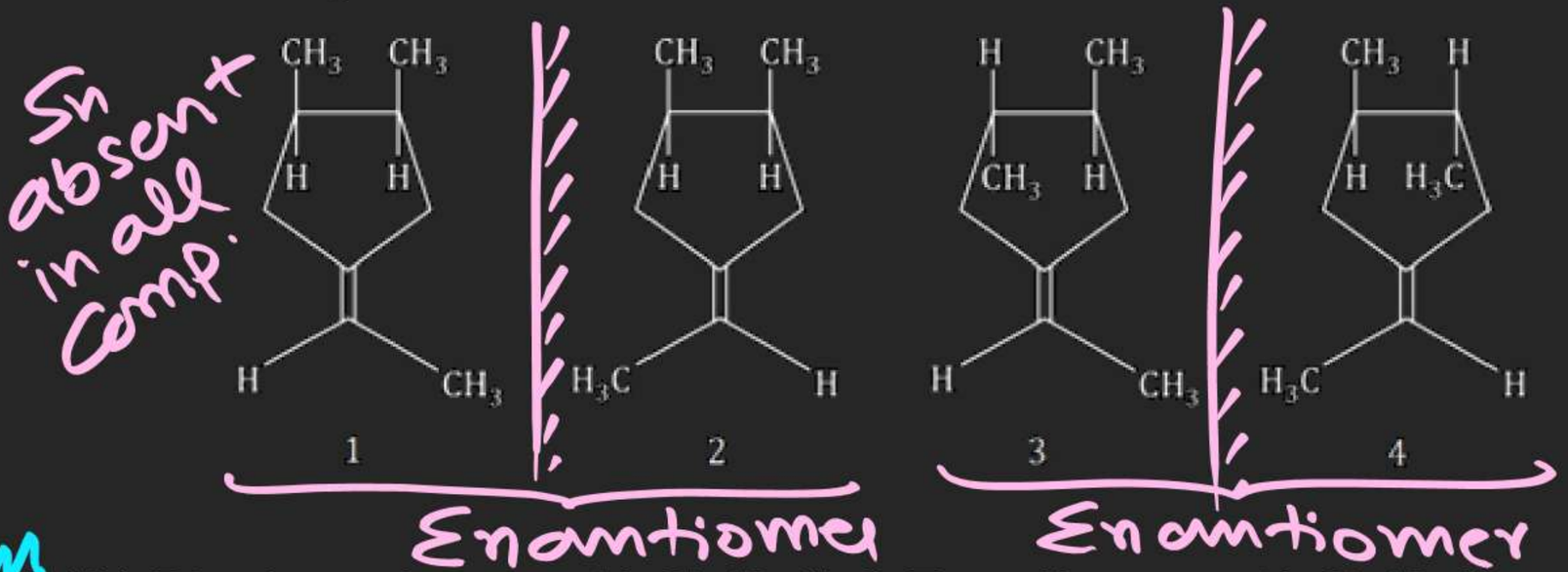
(A) I > III > II > IV

(B) IV > I > III > II

(C) IV > III > I > II

(D) II > III > I > IV

7. Select the pair of enantiomer and diastereomers out of the following:



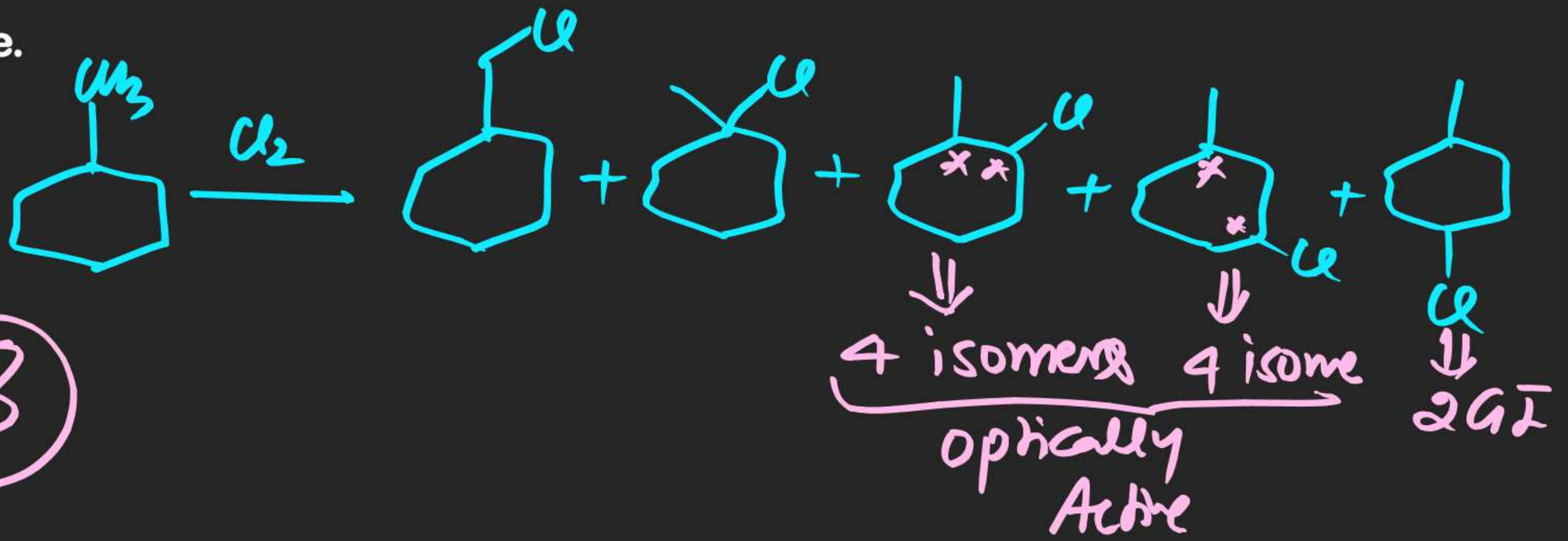
Ans (A) Diastereoisomer (1,3),(2,4) & Enantiomers-(1,2),(3,4)

Ans (B) Diastereoisomer (2,3), (1,4) & Enantiomers-(1,2),(3,4)

(C) Diastereoisomer (1,3),(3,4) & Enantiomers-(1,2),(2,4) ✗

(D) Diastereoisomer (1,3),(2,4) & Enantiomers-(3,4)(1,4) ✗

10. How many monochlorinated product of methyl cyclohexane are optically active.

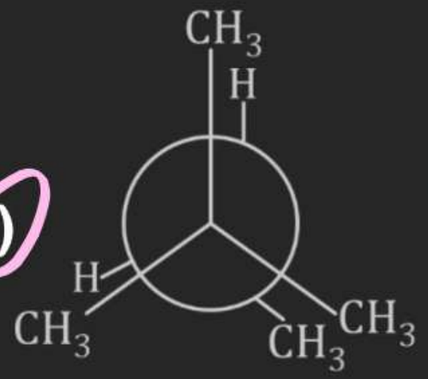


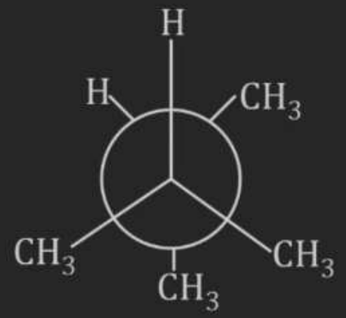
(8)

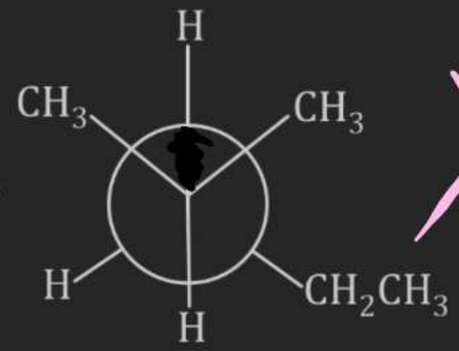
Paragraph for Q.16 to Q.17

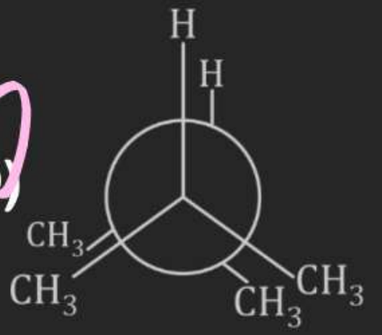
Conformational isomerism arises due to C – C bond rotation. Conformers differ in spatial arrangement of atoms or groups around C-atom arising due to C – C bond rotation.

16. The stable conformer of 2,3-dimethyl butane is

(A) 

(B) 

(C) 

(D) 

Paragraph for Q.16 to Q.17

Conformational isomerism arises due to $C-C$ bond rotation. Conformers differ in spatial arrangement of atoms or groups around C-atom arising due to $C-C$ bond rotation.

17. Which is not correct regarding the conformers?

(A) They are infinite in number

(B) Conformers can be obtained only by rotation across sigma bond

(C) They cannot be separated

(D) The energy barrier of them is not high

Flipping of Ring

$C_1 \rightleftharpoons C_2$