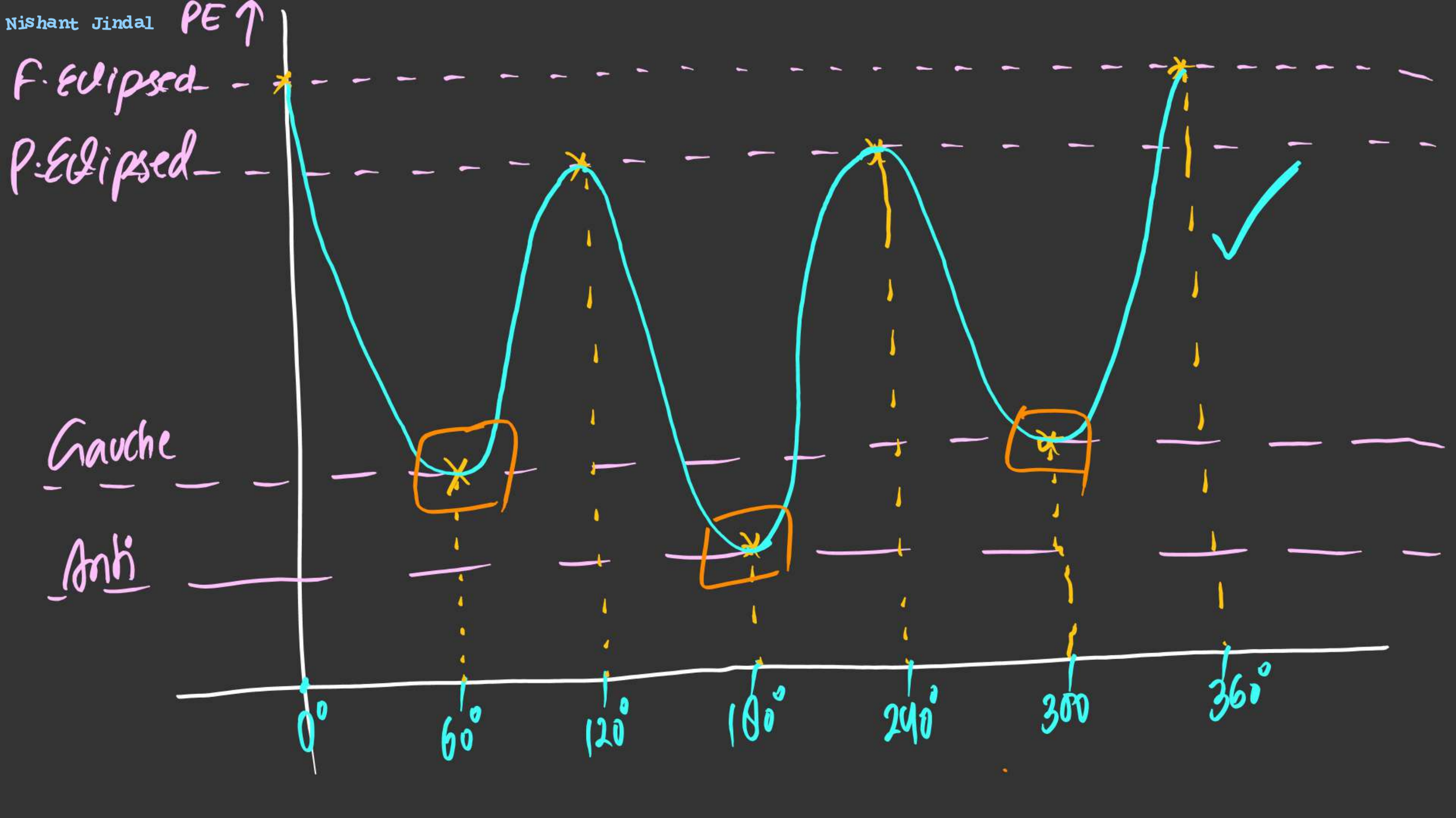
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PE ↑
F. Eclipsed
P. Eclipsed
Gauche
Anti
0°
60°
120°
180°
240°
300
360°

Note (i) Total possible conformation = ∞

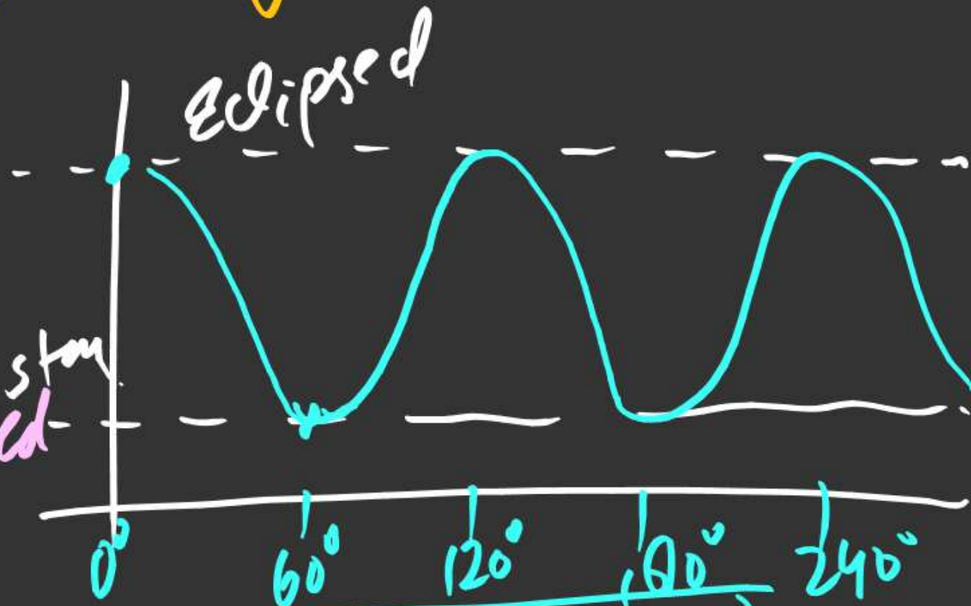
(ii) Total stable conformation ≤ Potential Energy minima

= 3 (1 Anti + 2 Gauche)

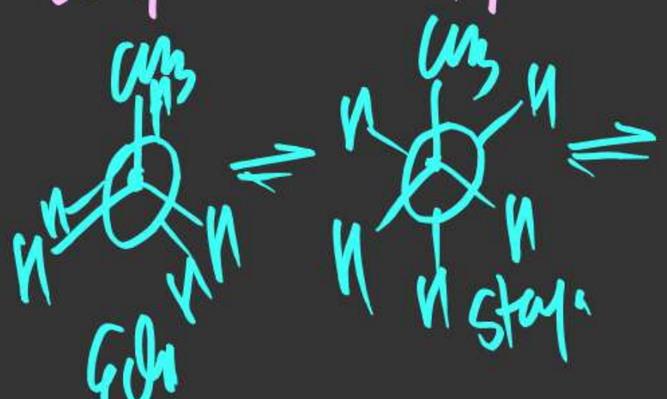
Ex-2: Draw Extreme Conformation of following & also draw its P. Energy Diagram.

(i) CH_2-CH_2 (H, H)

Eclipsed Staggered Eclipsed



(ii) CH_2-CH_2 (CH_3, H)



(iii)

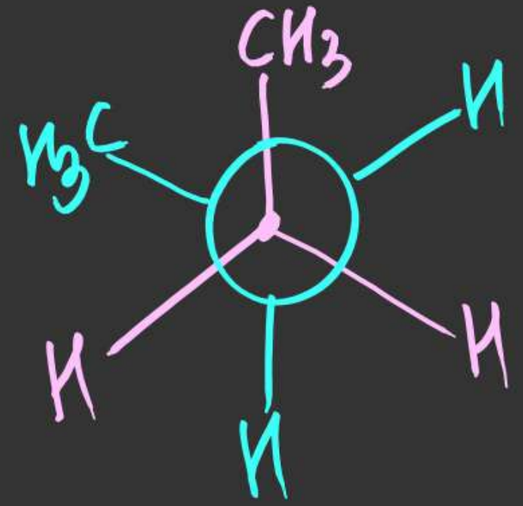
F ⇌ gauche ⇌ P. Eclipsed ⇌ Boat

Eclipsed

Ex-3: Find Conformation obtained when C_2 Carbon is Rotated clockwise By 180° in following Conformation

O ⇒ C_2

⇒



Gauche.

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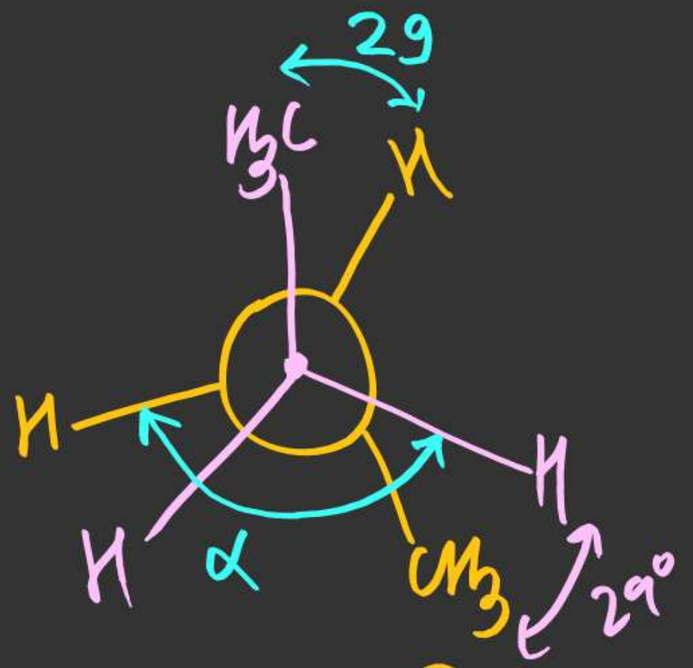
Ex-4: Find "α"



$$\alpha = \angle HOCH_3 + \angle CH_3OH$$

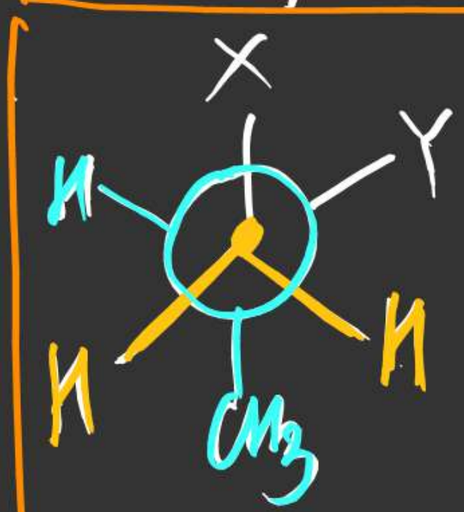
$$= 120^\circ + 29^\circ$$

$$= 149^\circ$$

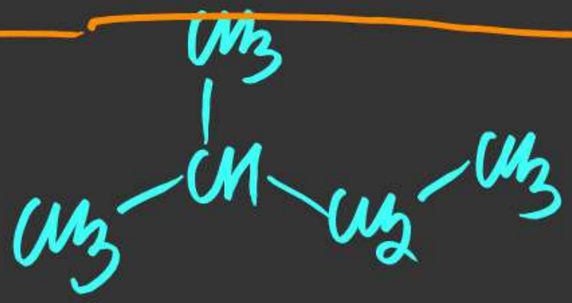
Ex-5 Find all possible pair of (X, Y) so that following is a conformation of isopentane

$(X, Y) \Rightarrow (-H, -CH_2-CH_3)$

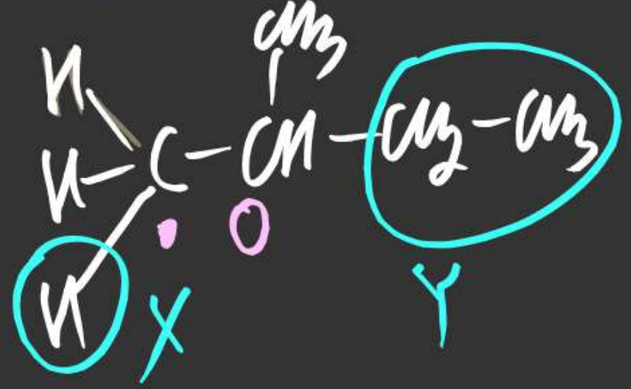
$\Rightarrow (-CH_3, -CH_3)$

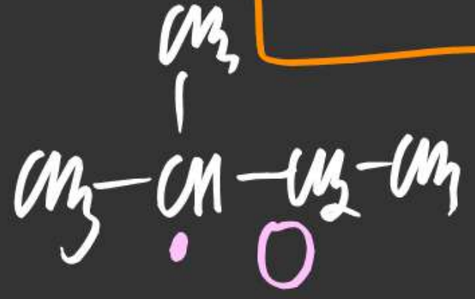


$\Rightarrow$

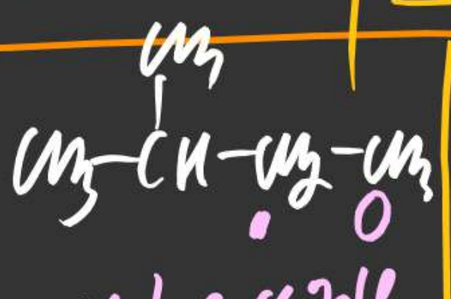


Left to Right:



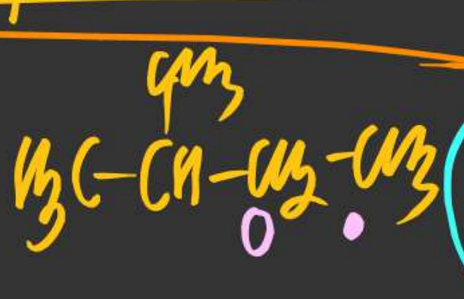


Not possible

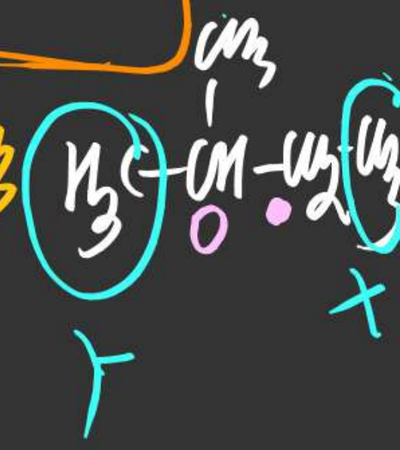


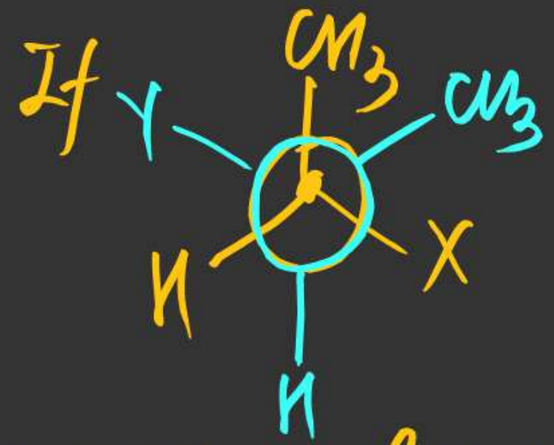
Not possible

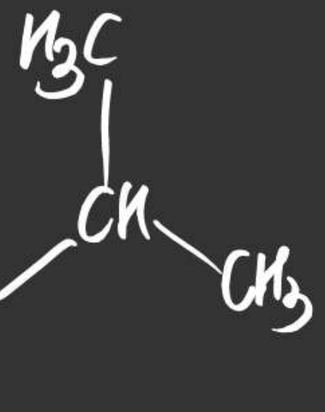
Right to left



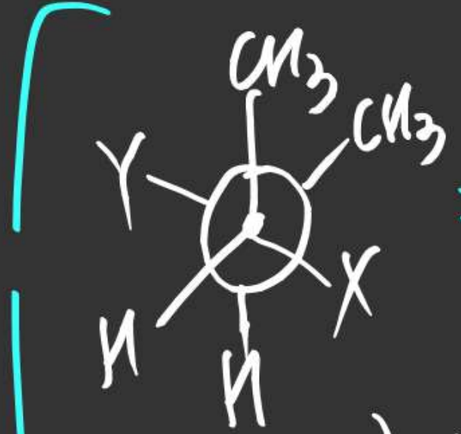
Not possible



Ex-6 If  is a isomer of isoButane, find all possible value of (X, Y).



Soln:



$(X, Y) \Rightarrow (-H, -H)$

$H_3C-CH_2-CH_2-CH_3$ — n-Butane

isomer ⇐

iso-Butane

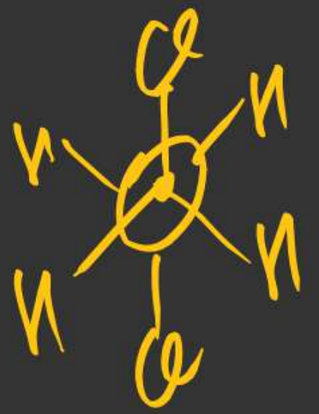
(#) Draw most stable Conformation

(7) H_3C-CH_3

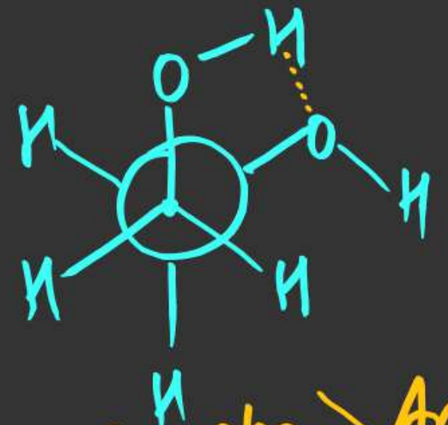
(8) $H_3C-CH_2-CH_3$

(9) $H_3C-CH_2-CH_2-CH_3$

(10) $Cl-CH_2-CH_2-Cl$

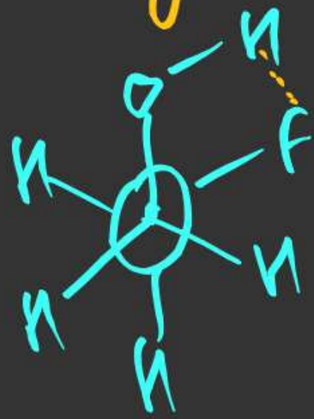


(11) $CH_2(OH)-CH_2(OH)$ (Ethylene Glycol)



gauche > Anti

(12) $CH_2(OH)-CH_2(F)$



g > A

(13) $CH_2(OH)-CH_2(NH_2)$

g > A

(14) $CH_2(\overset{\oplus}{N}H_3)-CH_2(COO^{\ominus})$ g > A

(15) $CH_2(\overset{\oplus}{N}R_3)-CH_2(COO^{\ominus})$ g > A

Electrostatic attraction

(16) $CH_2(COOH)-CH_2(COOH)$ g > A

Note: Presence of intramolecular H-bonding is supporting phenomenon for higher stability.

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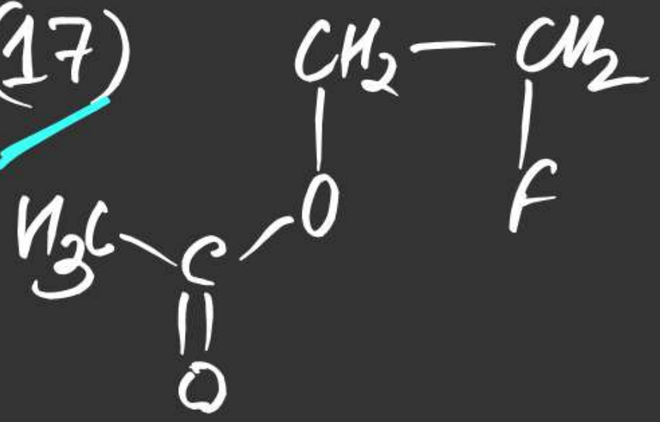
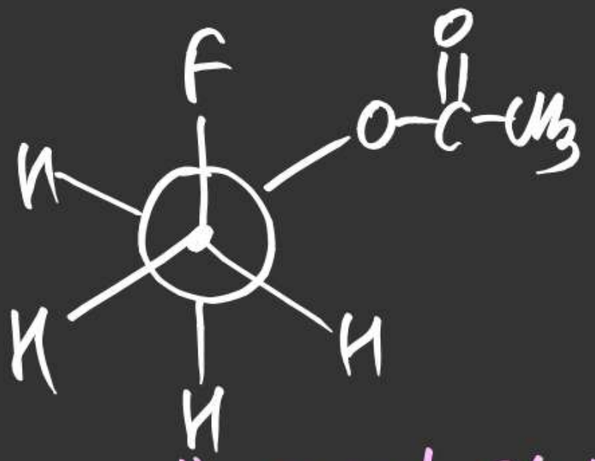
(17)

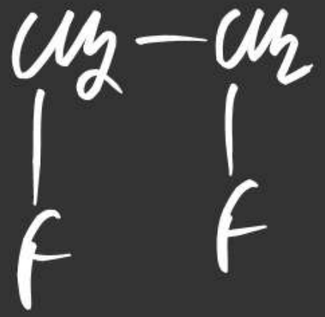


$\Rightarrow$



"Gauche" most stable Conformation

(18)

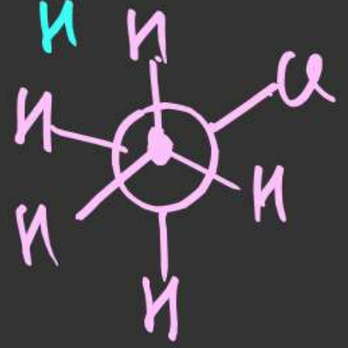


$\Rightarrow$ (gauche most stable Conformation)

(#) Calculate Total No. of Stable Conformation

Total No. of Stable Conformation (Staggered)
= Total diff. Gauche + Total diff. Anti

(19) H_3C-CH_3  "1"

(20) H_3C-CH_2-Cl  "1"

(21) $H_3C-CHCl_2$ "1"

(22) H_3C-CCl_3 "1"

(23) H_3C-CD_3 "1"

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(24) $H_3C-CH_2-CH_3$

Staggered Staggered

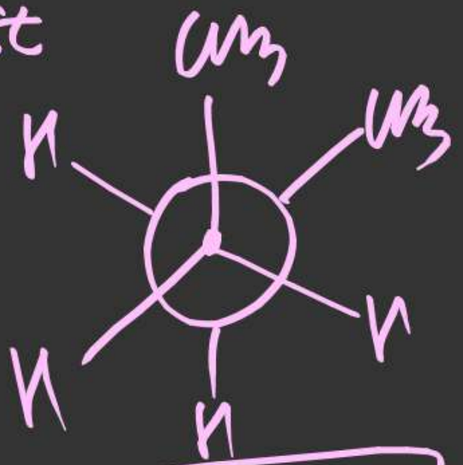
St St
St ∈
∈ St
∈ ∈

⇒ Stable conformation = 1

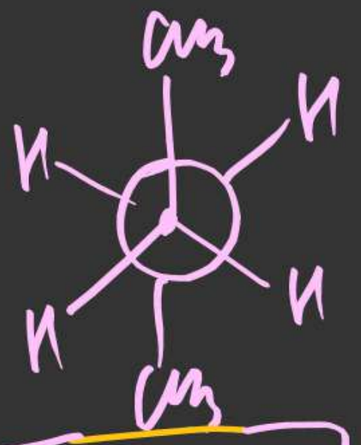
(25) $H_3C-CH_2-O-CH_2-CH_3$

St St

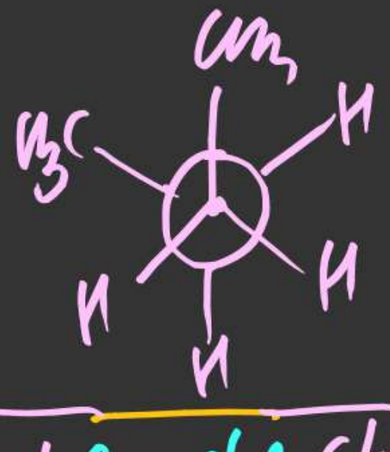
St/∈
St/∈



St Gauche St



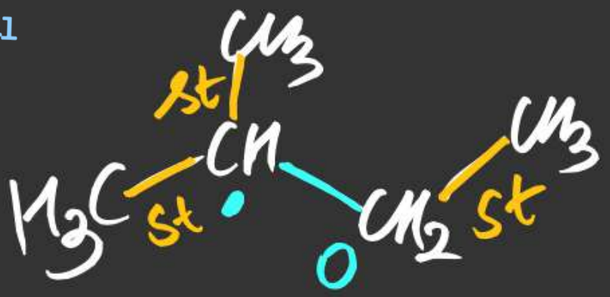
St Anti St

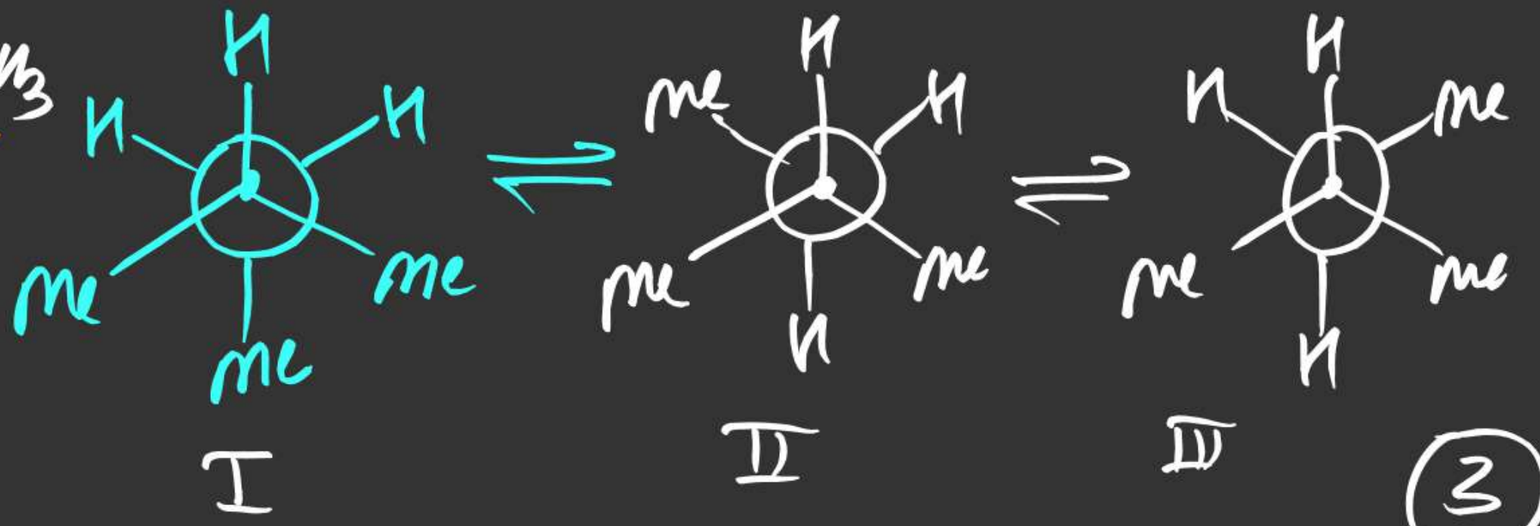


St Gauche St

3

(26)





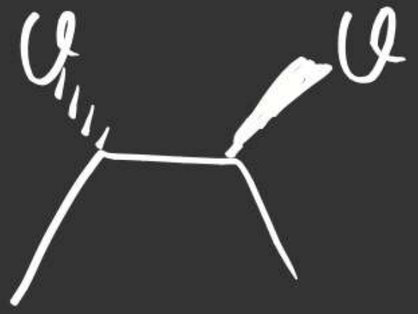
I ⇌ II ⇌ III

(3)

(27)

(28)

(29)



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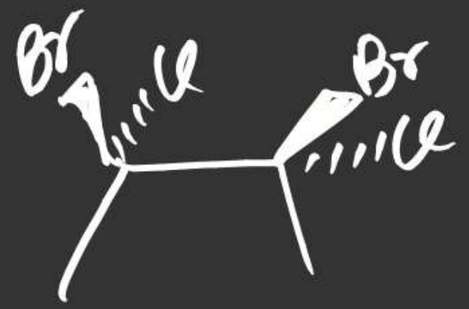
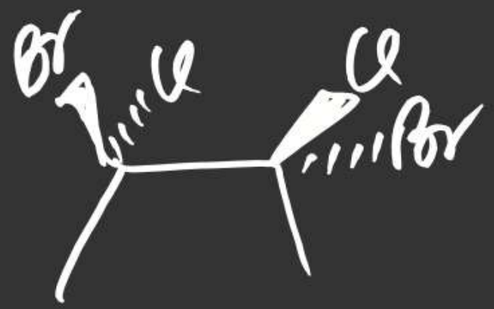
(30)



(31)



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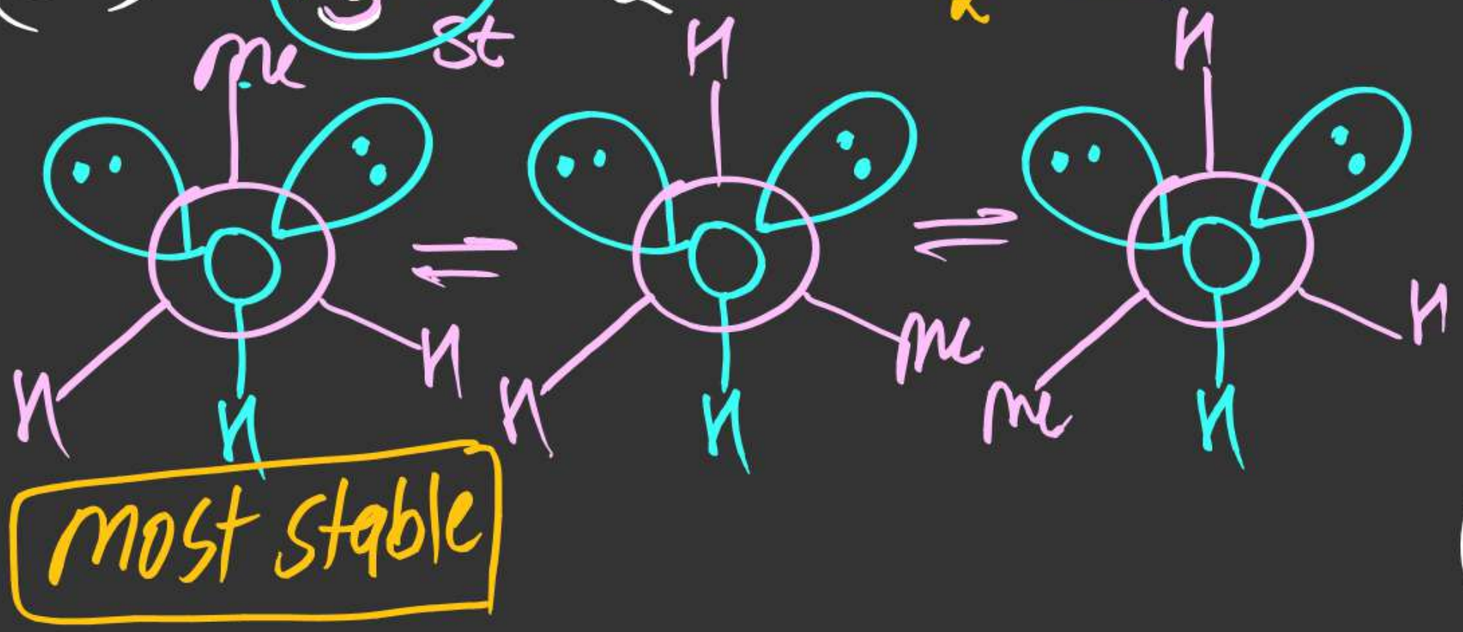
Draw most stable Conformation

(32) H_3C-CH_2-OH ⇐ O

Back — front atom

3



most stable

(33) $H_3C-CH(CH_3)-OH$

(34) $CH_3-CH_2-NH_2$

(35) $H_3C-CH(CH_3)-NH_2$

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Note: For most stable Conformation Across Carbon—hetroatom Bond, Bulkier group of Carbon must be maximum gauche position with lone pair of hetro atom

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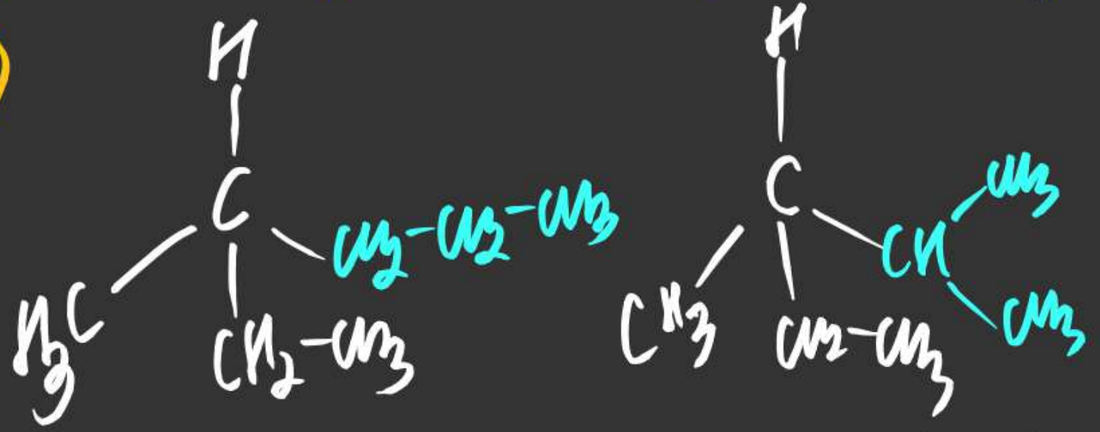
Blue-Book Discussion (Isomerism)

JEE Main Excercise

(3) C_6H_{14} 

(4) (D) linear (No sense of Rotation)

(5) (C)

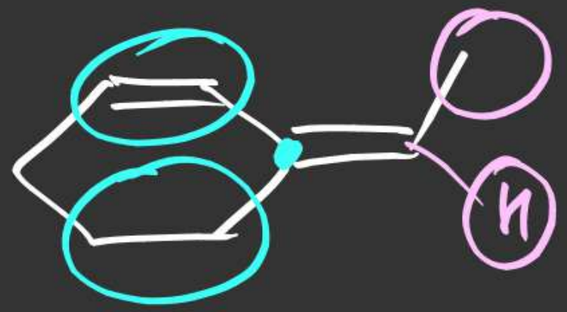


(6) (C)

$$\text{Reactant} \rightleftharpoons \text{Product}$$

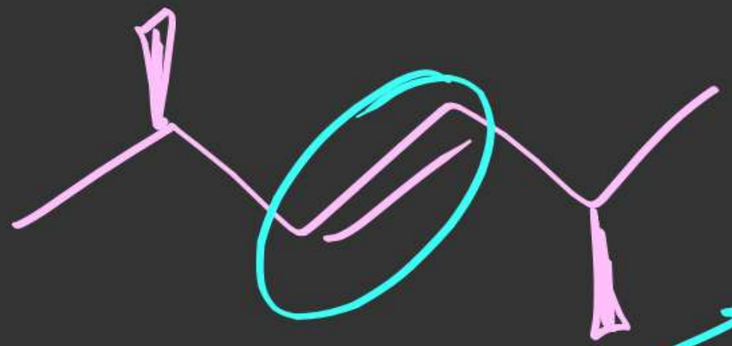
$$K_{eq} = \frac{[\text{Product}]}{[\text{Reactant}]} = \frac{50}{50} = 1$$

(11) (D)



GI ✓

(17)



GI → Cis

GI → Trans

(2)

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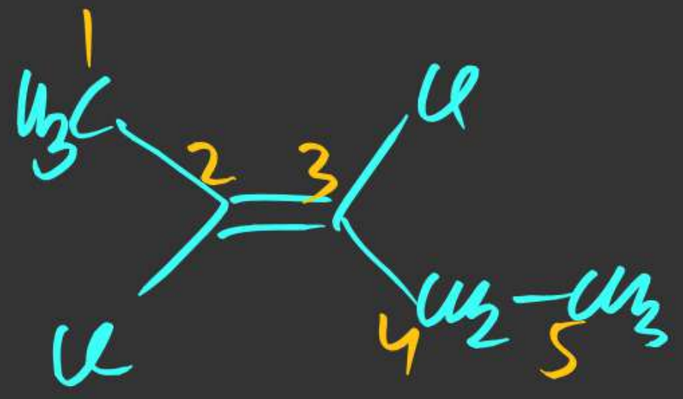
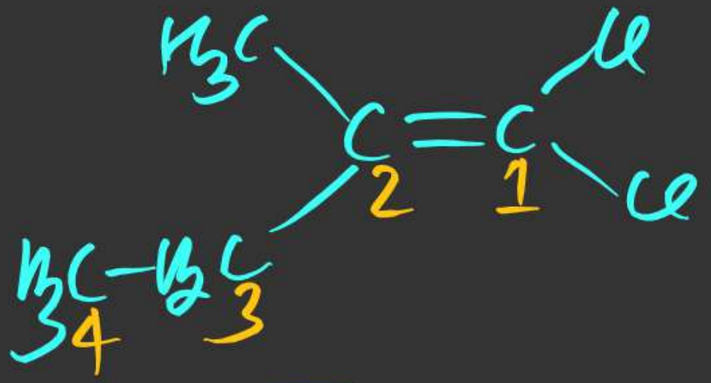
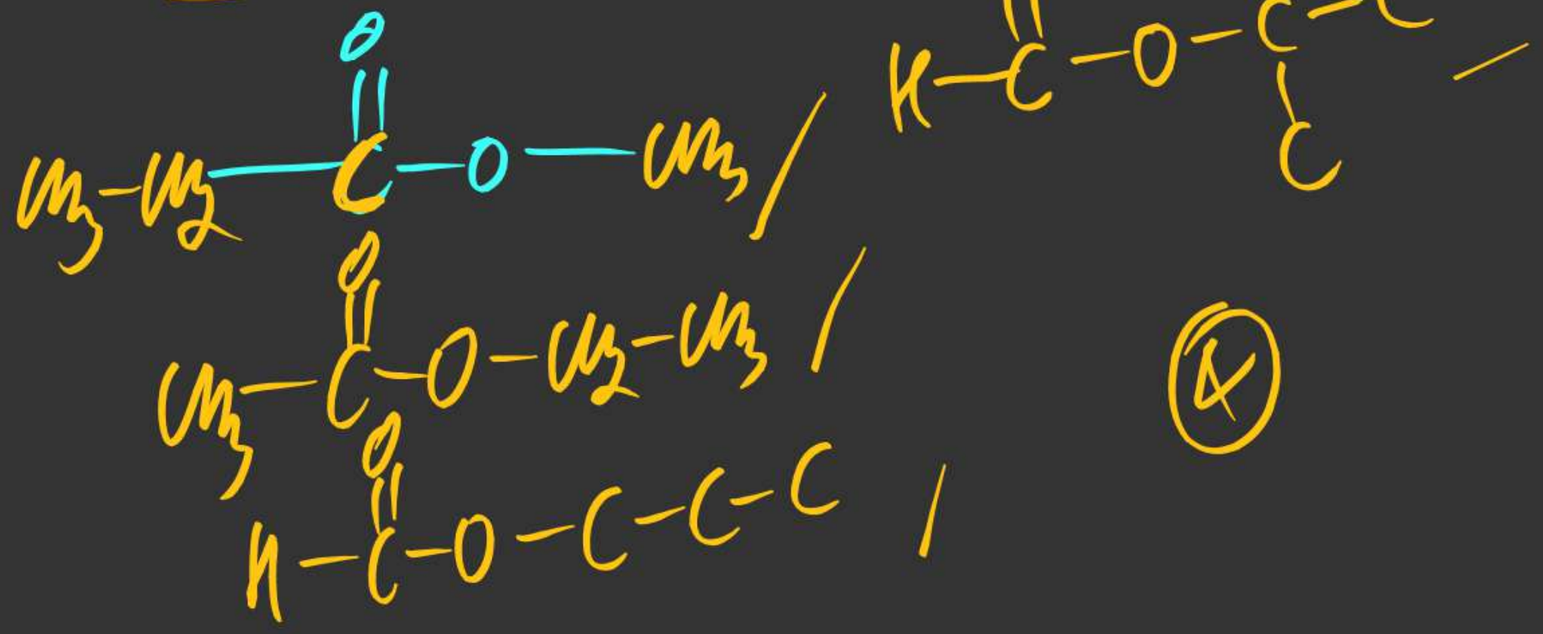
(19) 



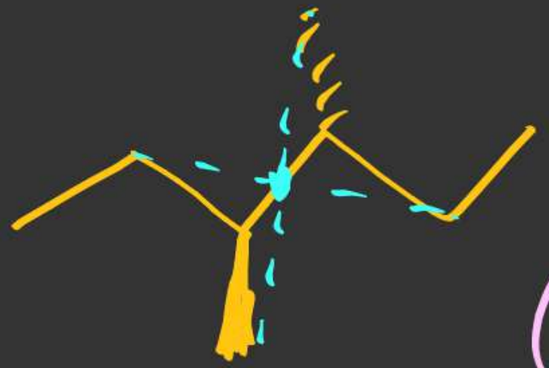
chain isomers

(20) Answer Correction $\boxed{\text{Ans} \Rightarrow \text{A}}$

(21) $C_4H_8O_2$ 

(4)

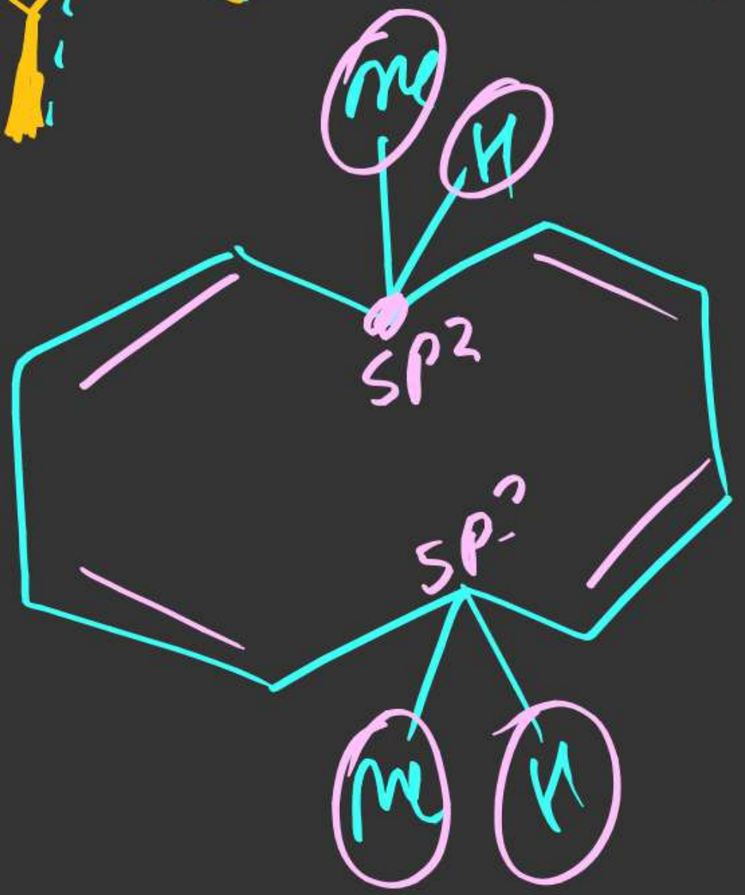
(29)



CC = 2

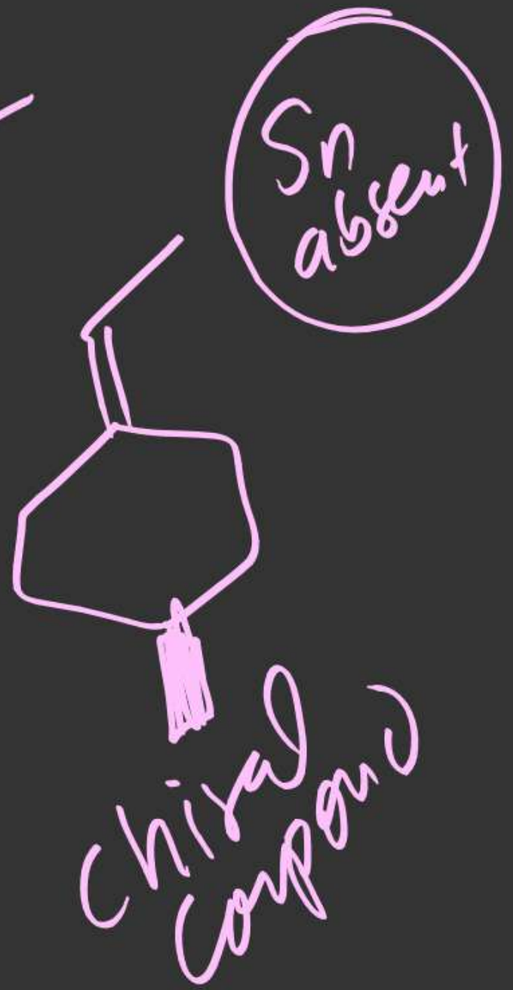
COS ⇒ meso

(27)



GI ✓

(38)



(33) Constitutional isomers

⇓

Structural isomers.

(35)

$C_8H_{16}O_3 \Rightarrow$ DOU = 1

✗ (A)