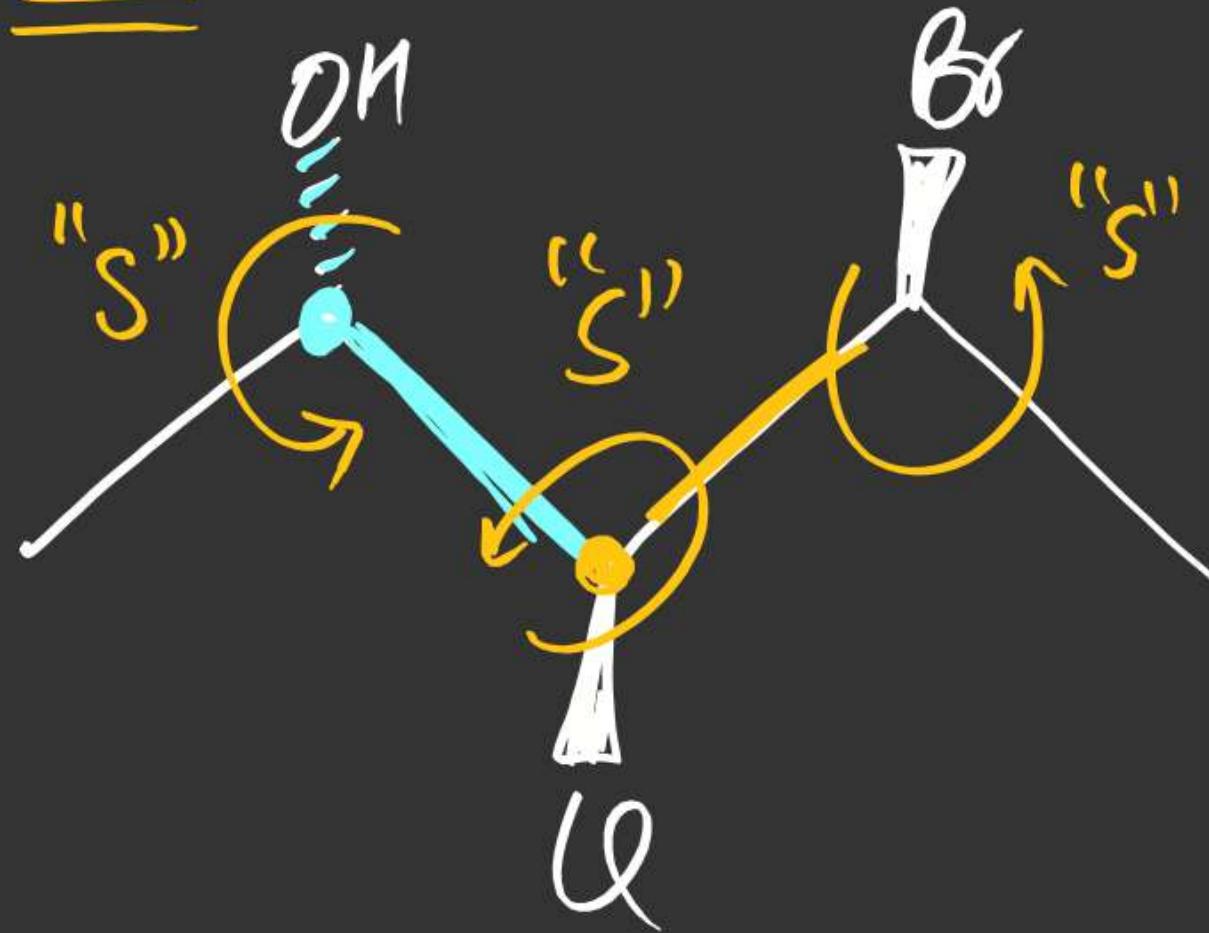
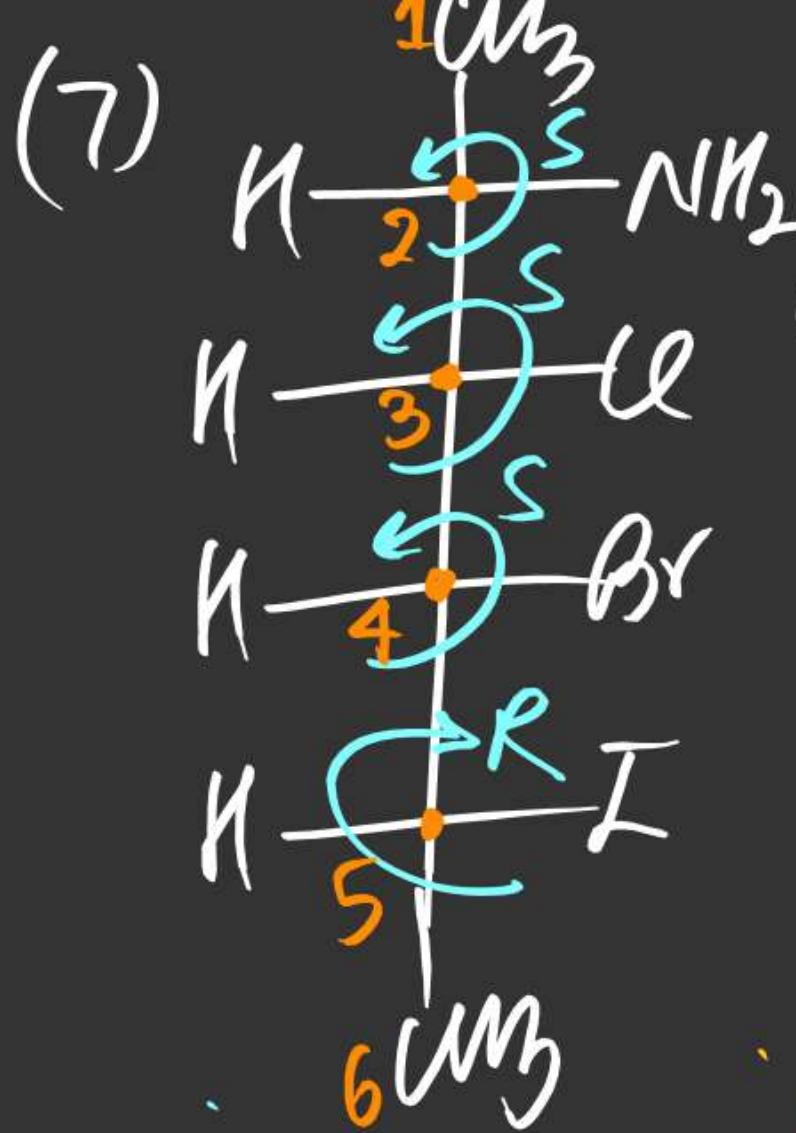


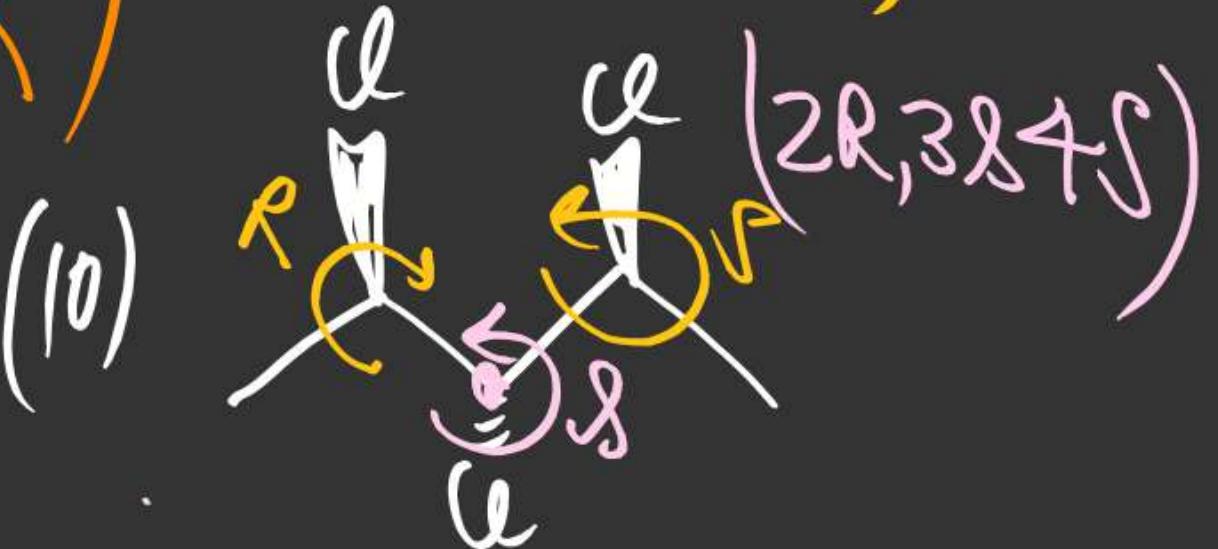
SOLⁿ!

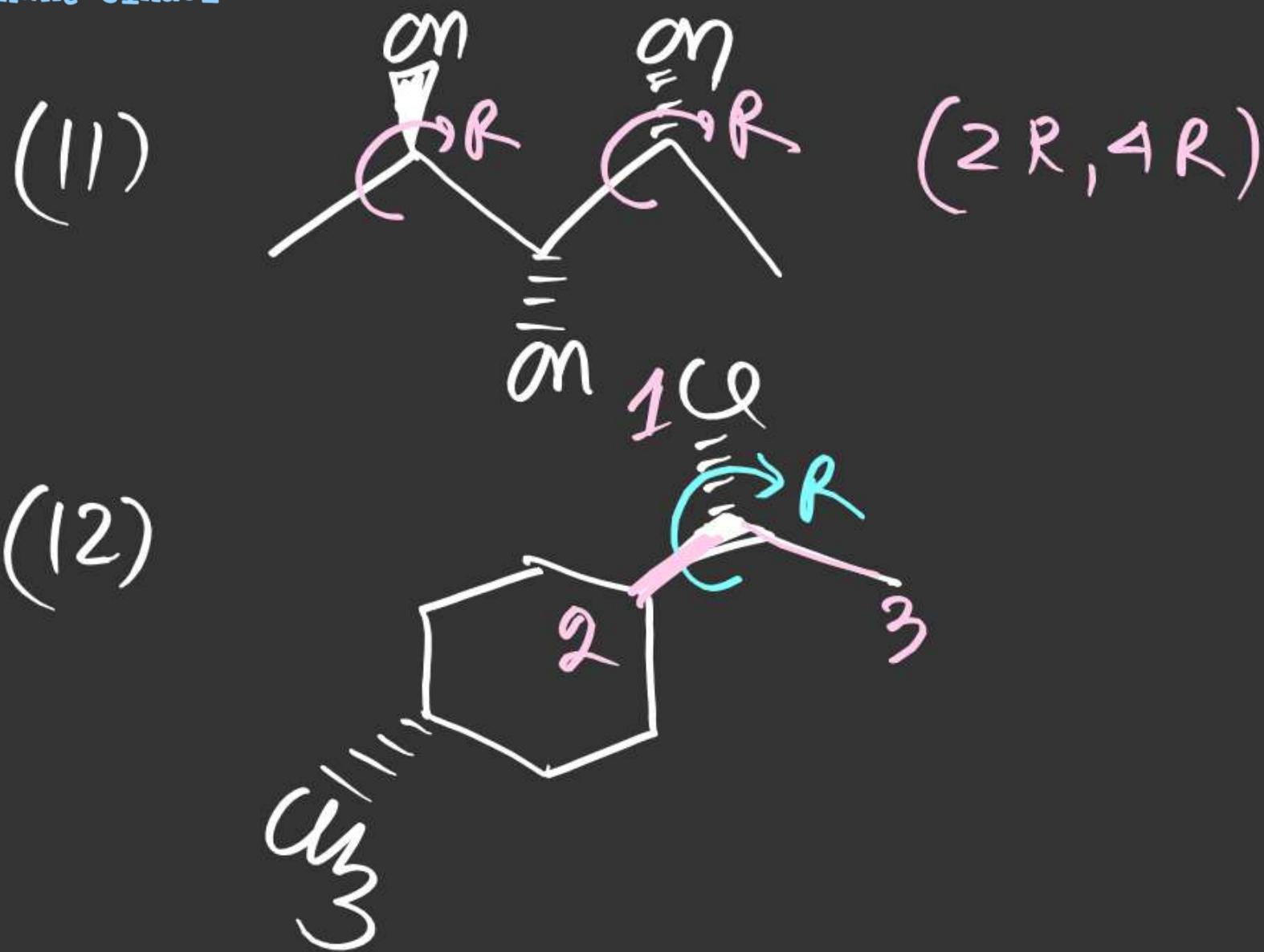


(2S, 3S, 4S, 5R)



(2R, 3R, 4R, 5S, 6R)





Symmetry POS, COS AOS, AAOS

Chiral centre

P,S Chiral centre

Fischer Projection formula

D/L

Threo & Erythro

R & S

Relationship b/w Stereoisomers

Enantiomers

Compounds which are

(i) Non Superimposable (NO POS, NO COS
NO AAOS)

(ii) & mirror images of each other

known as Enantiomers.

Note

(i) Enantiomers are always optically

Diastereomers

Compounds which are

(i) Stereoisomer of each other (GI
or OI)

(ii) & Non mirror images of
each other.

known as Diastereomers.

^(or)
Stereoisomers which are not Enantiomers
are known as Diastereomers

Active.

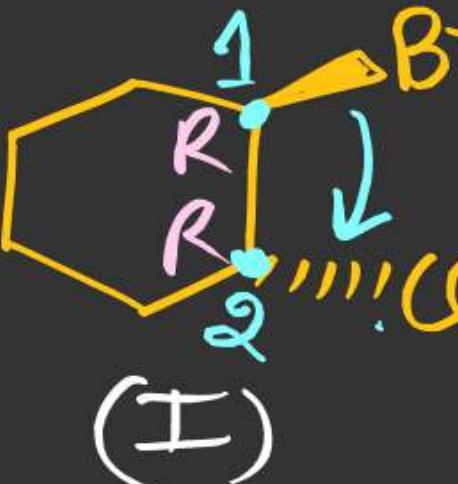
- (ii) Enantiomers Rotate PPL By same magnitude But opposite sense of directions.
- (iii) Enantiomers contain same physical properties like (BP, mp, Solubility, Refractive index, dissociation constant etc)
- (iv) Enantiomeric mixture can't be separated by fractional distillation method.

- Note
- (i) Diastereomes may be
 - Both Active
 - Both inactive
 - & One Active & one inactive
 - (ii) Diastereomes contain diff. Physical properties like (BP, mp, solubility, refractive index, dissociation constant etc).
 - (iii) Diastereomeric mixture can be separated by fractional Distillation method.

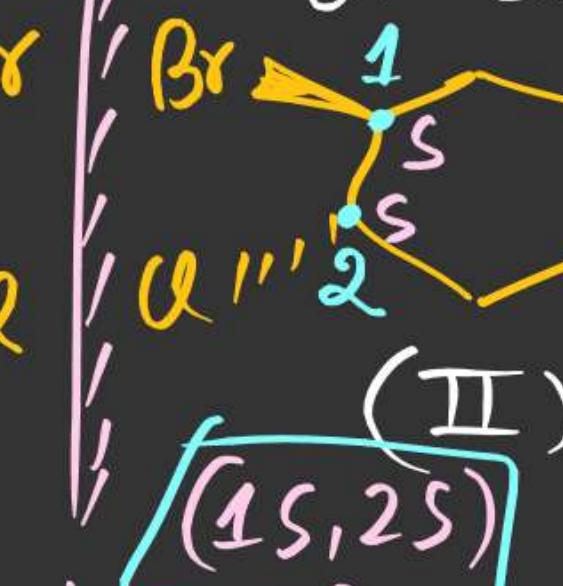
Find Relationship :-

(*) Same MF
(*) Same Str. formula

(1)

 $(1R,2R)$

(I)

 $(1S,2S)$

(II)

I & II \Rightarrow Enantiomers

Sn absent (pos, cos absent)
mirror image

I & III \Rightarrow Diastereomers

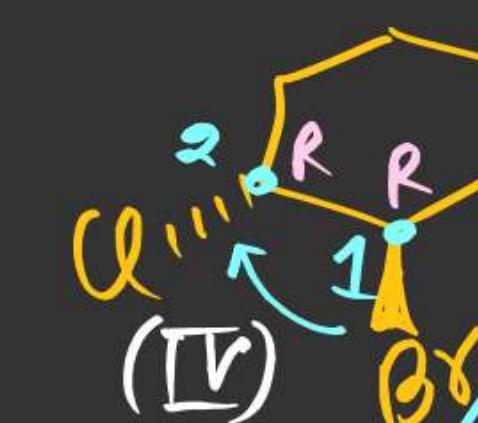
Non mirror image



(III)

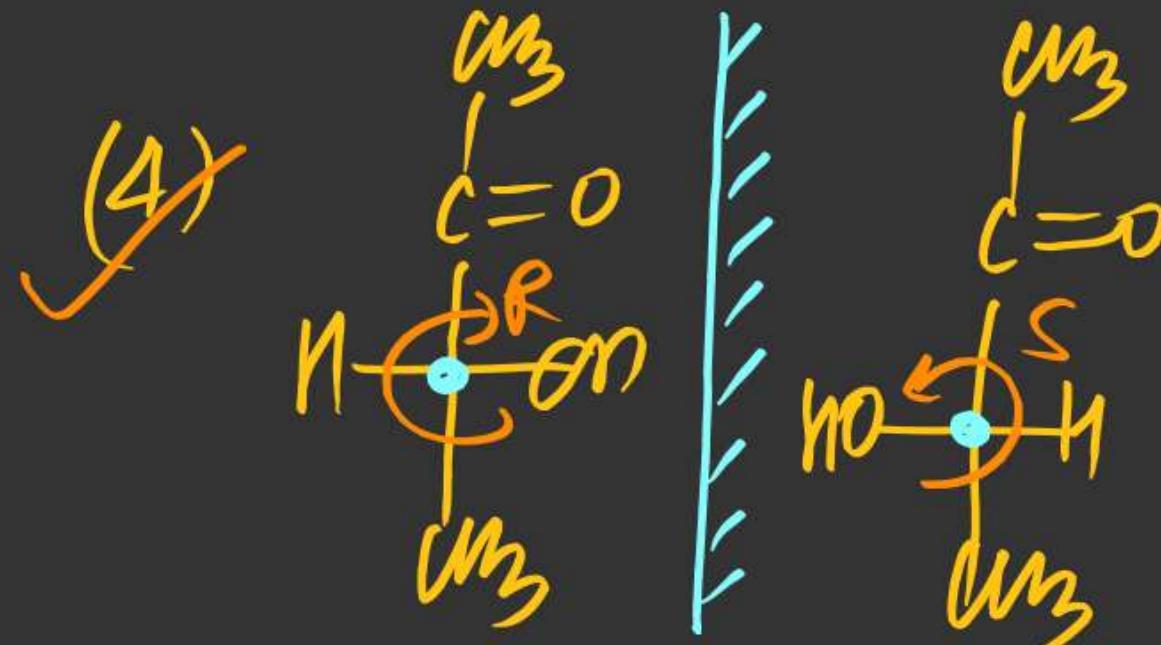
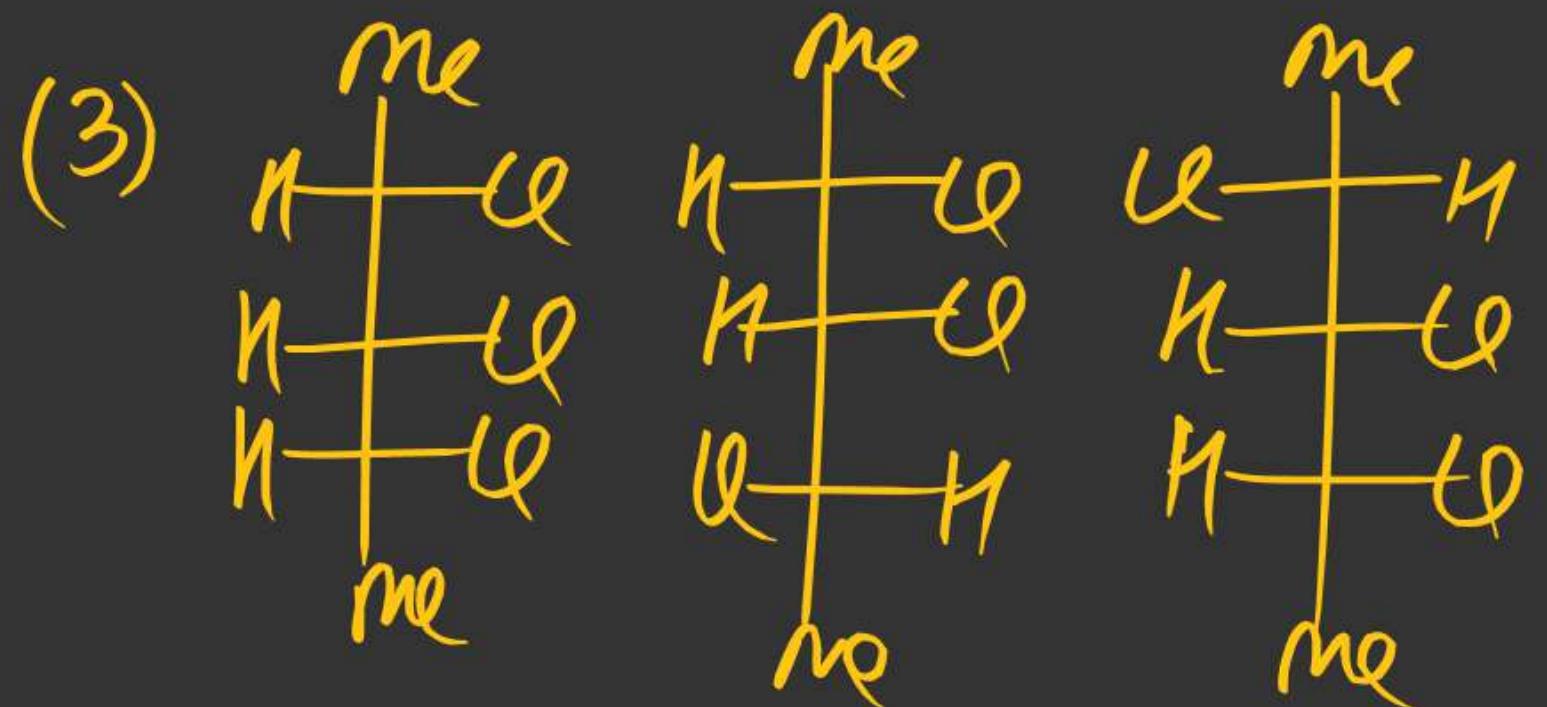
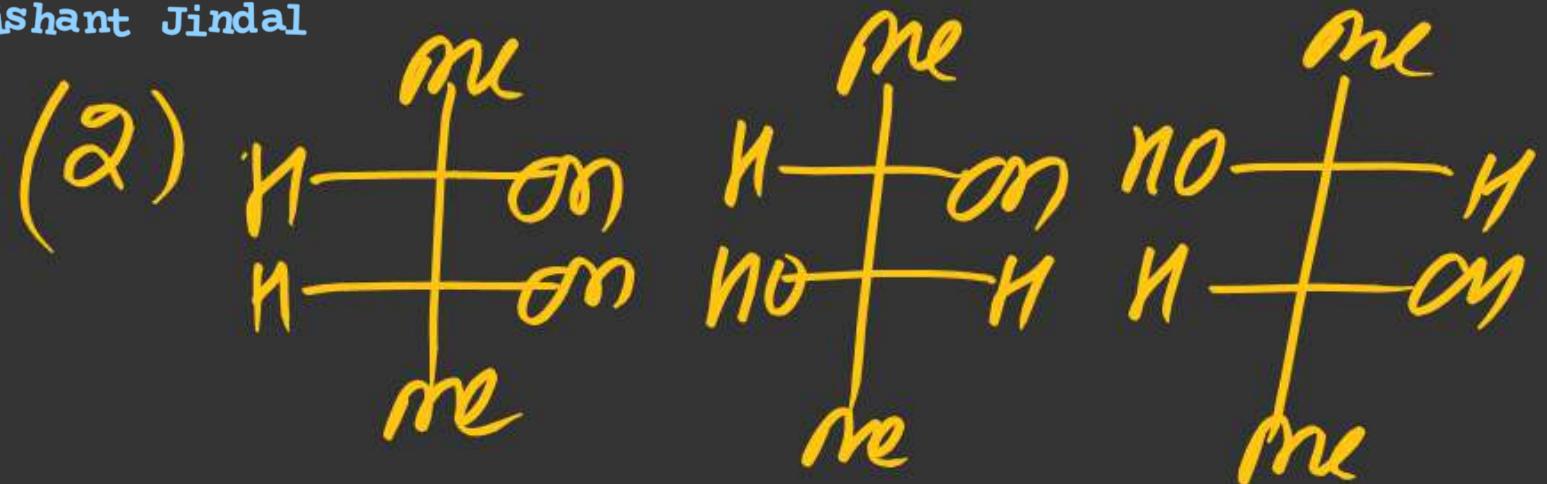
 $(1R,2S)$ II & III \Rightarrow Diastereomers.

Non mirror
image

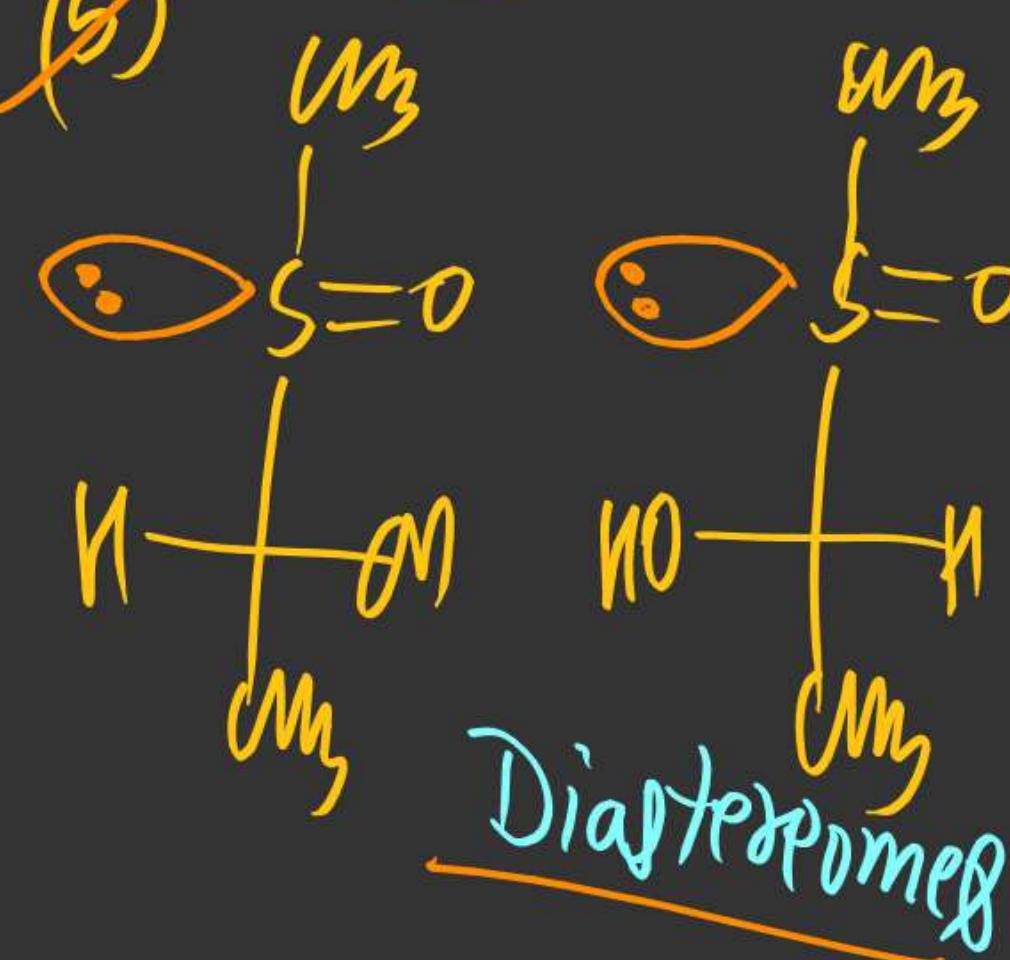
I & IV \Rightarrow identical

(IV)

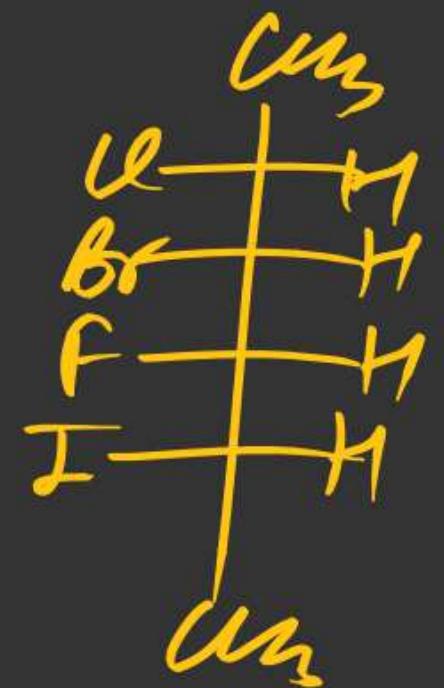
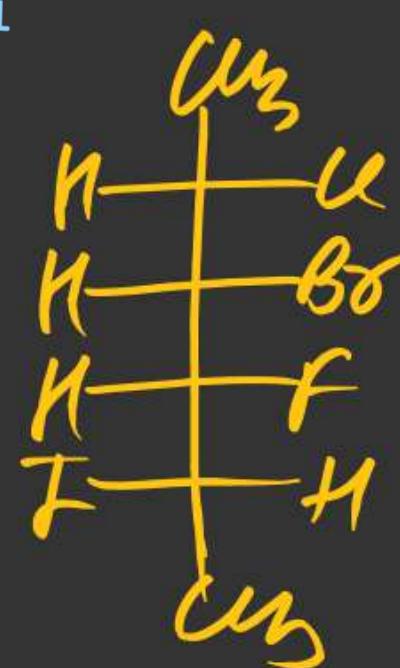
 $(1R,2R)$



(Enantiomers)



(12)



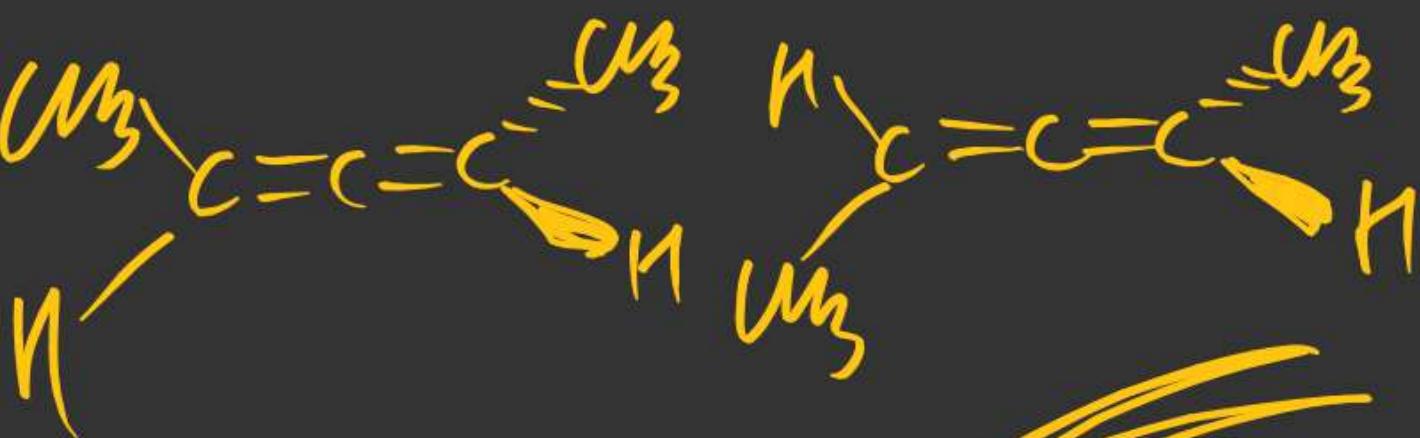
(15)



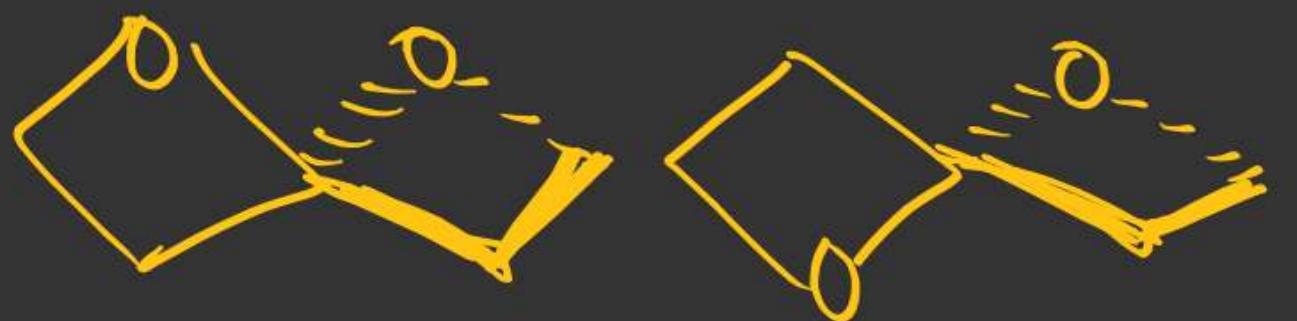
(13)



(16)

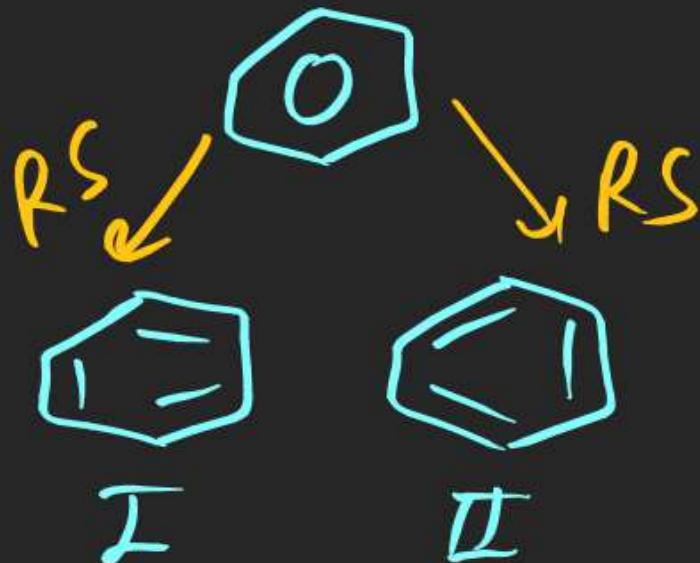
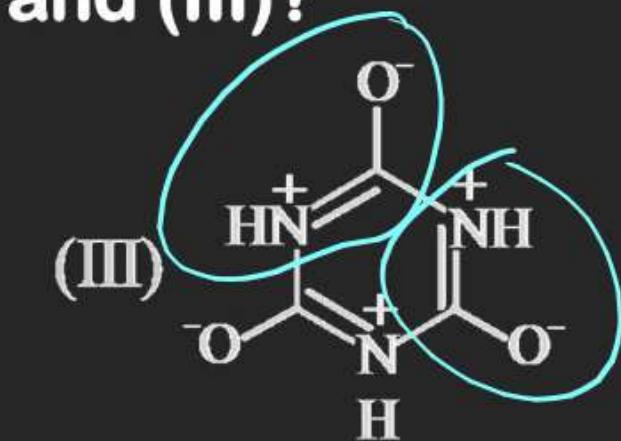
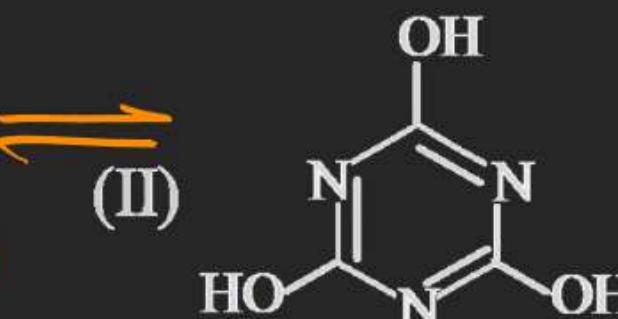
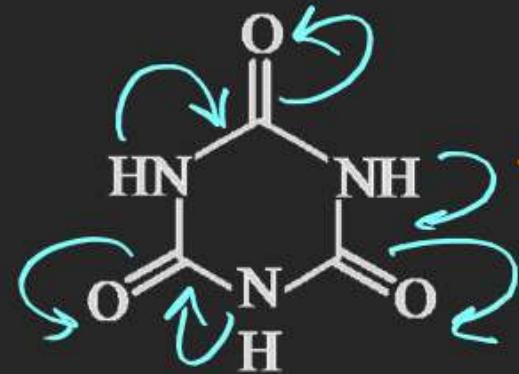


(14)



Structural Isomerism

11. What is relation between (I), (II) and (III)?

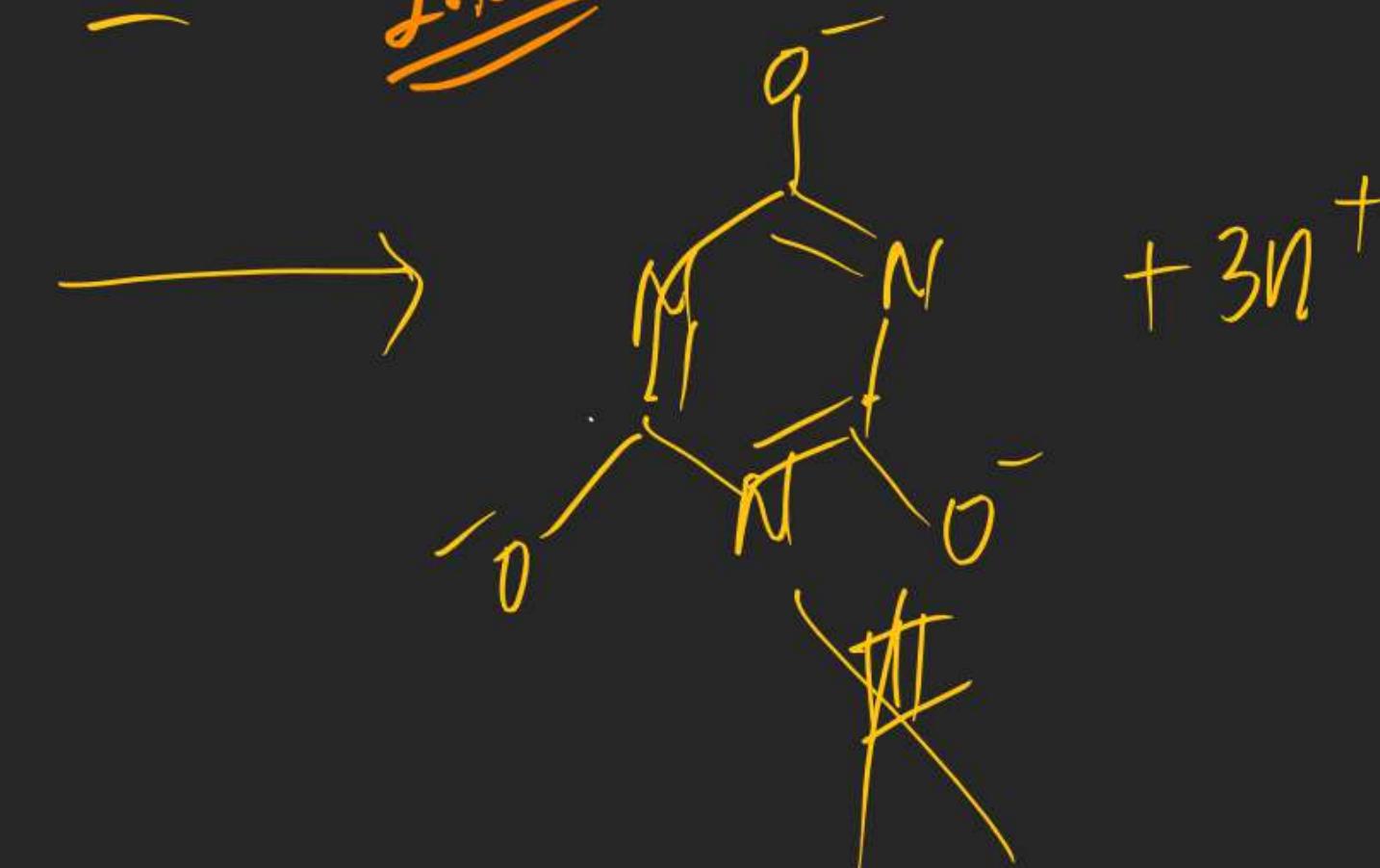
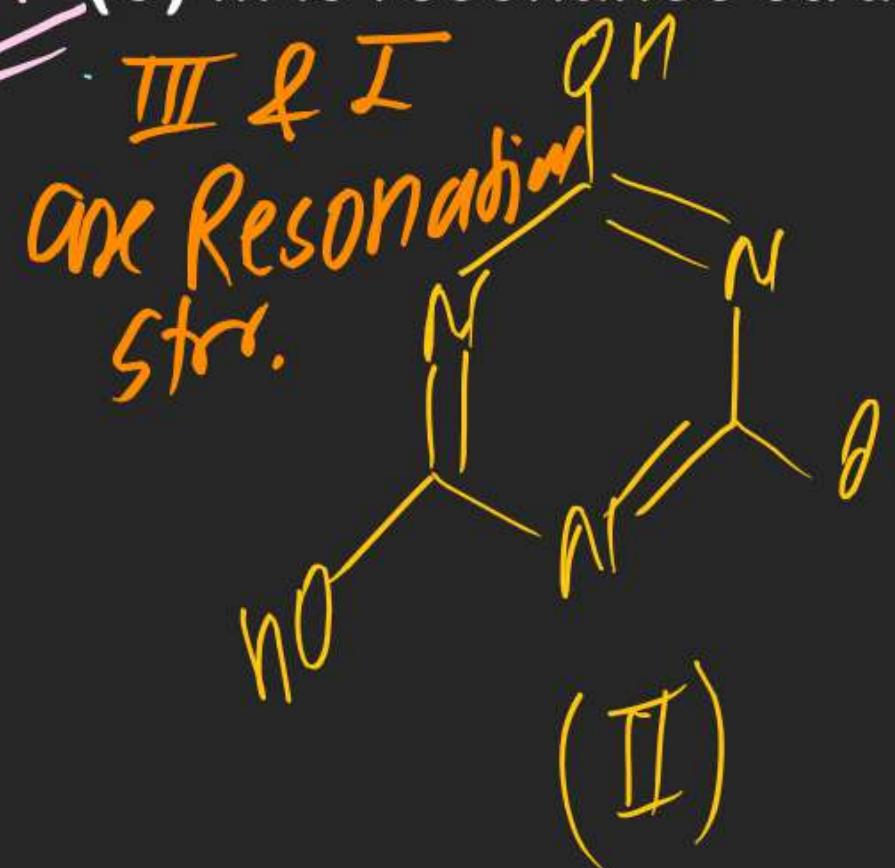


Correct (A) I and II are tautomers

Inconclusive (C) III is resonance structure of I

Inconclusive (B) III is conjugate base of II

Inconclusive (D) no relation exists

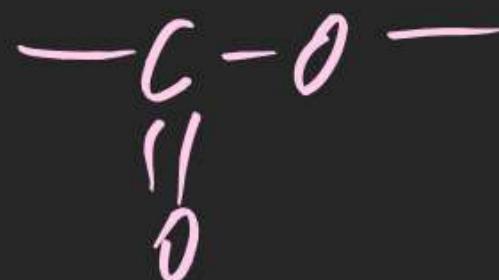


Structural Isomerism

12. The isomerism observed in cyclo alkanes is(are):

- (A) metamerism
(C) position isomerism

- (B) chain isomerism
(D) Both B and C



Structural Isomerism

13. Only two isomeric monochloro derivatives structure are possible for:

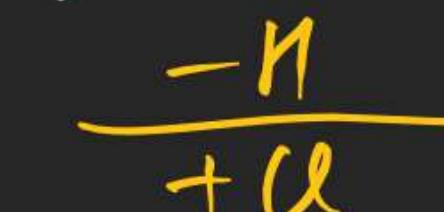
- ~~(A)~~ (A) n-butane
~~(C)~~ (C) benzene

(B) 2, 4-dimethyl pentane

~~(D)~~ (D) 2-methyl propane

~~Excluding stereo~~
~~In stereo~~

Sol'n: (A)



*

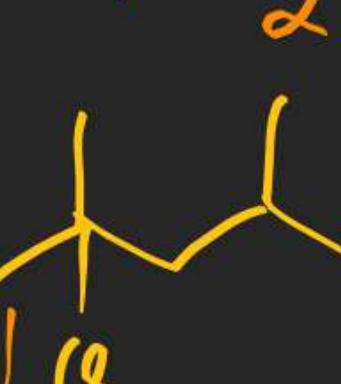
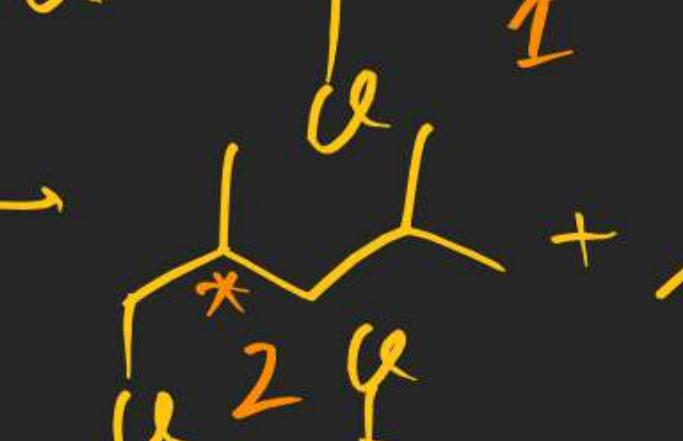
*

*

2

3

(B)



3

4

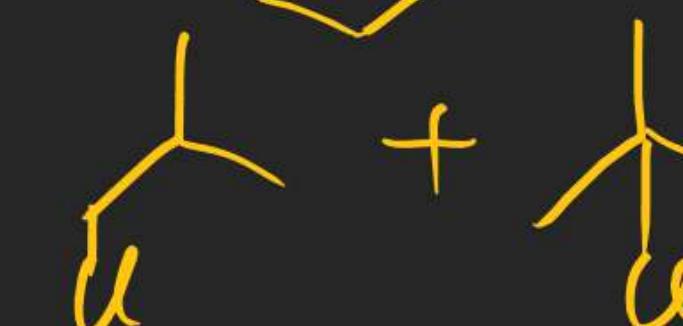
(C)



1

1

(D)



2

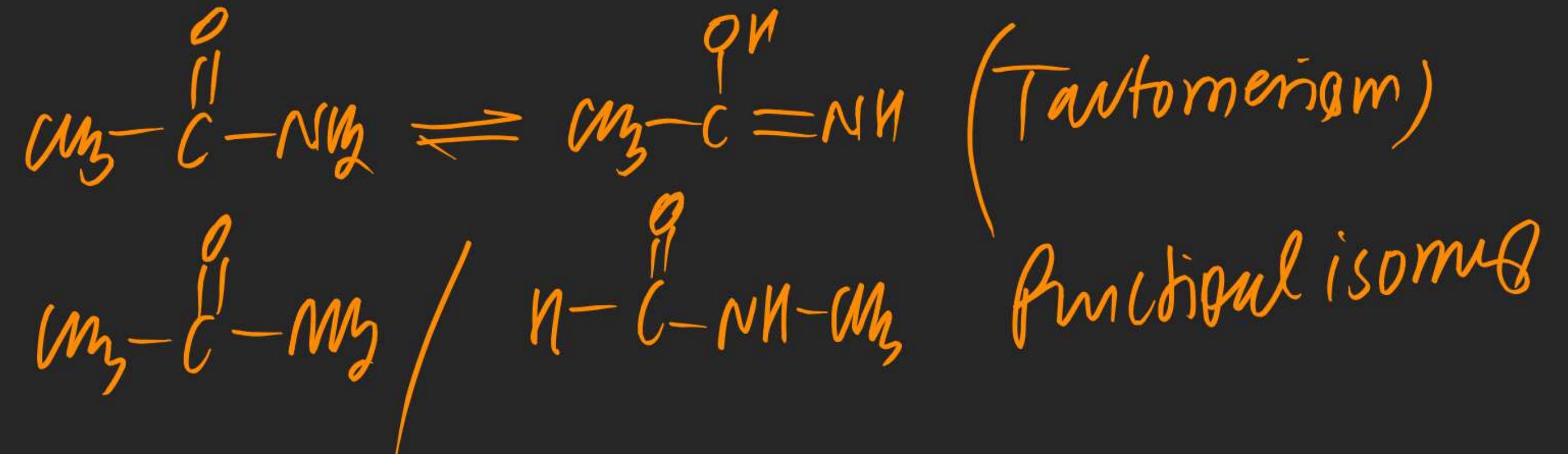
2

Structural Isomerism

14. An organic compound with molecular formula C_2H_5NO contains doubly linked atoms. It can shows:

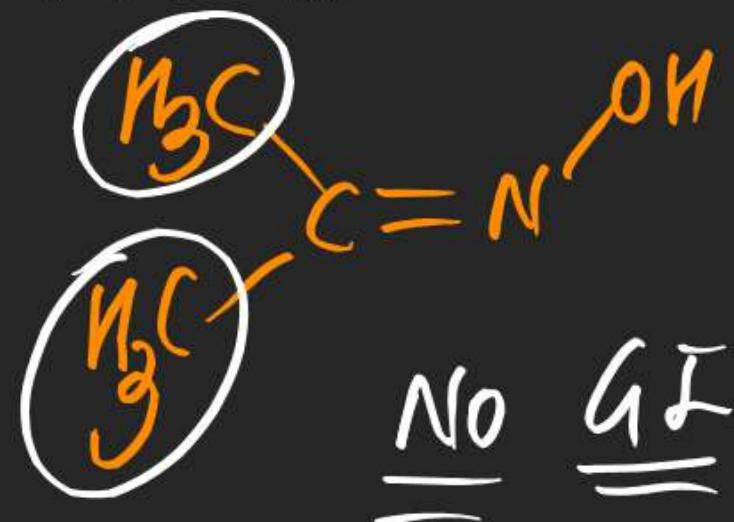
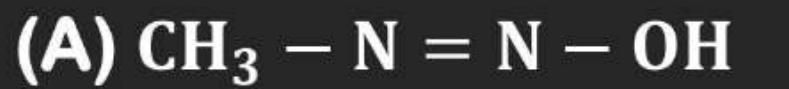
- (A) chain isomerism
- (C) tautomerism

- (B) Functional Isomerism
- (D) positional isomerism



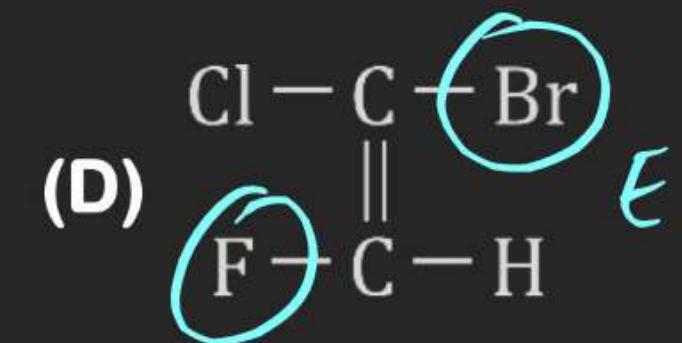
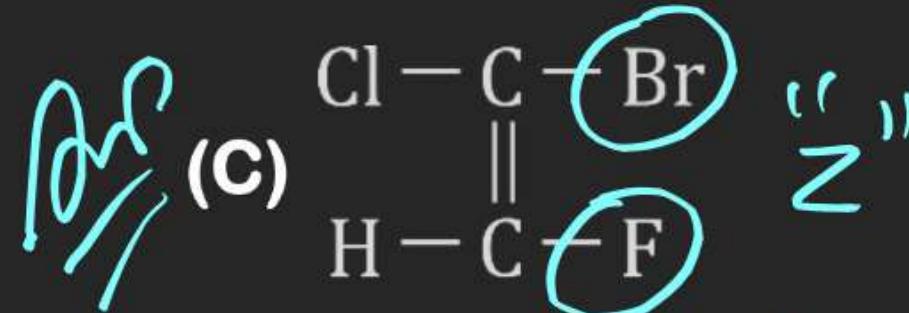
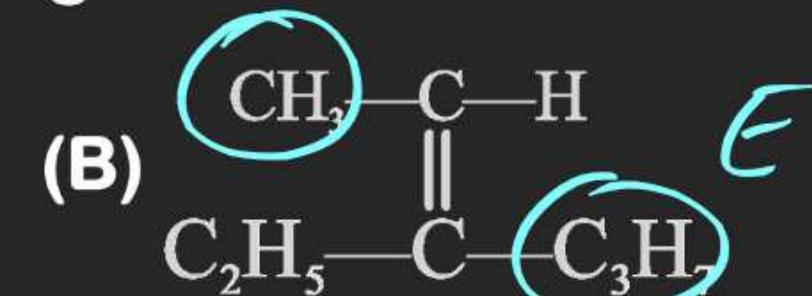
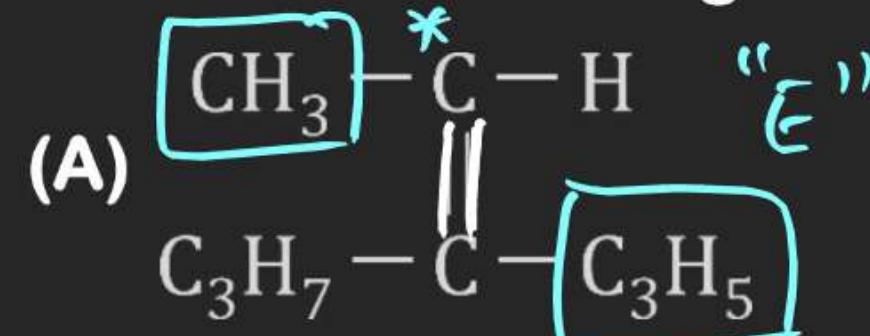
Structural Isomerism

15. Which of the following can exist in 'syn' and 'anti' form?

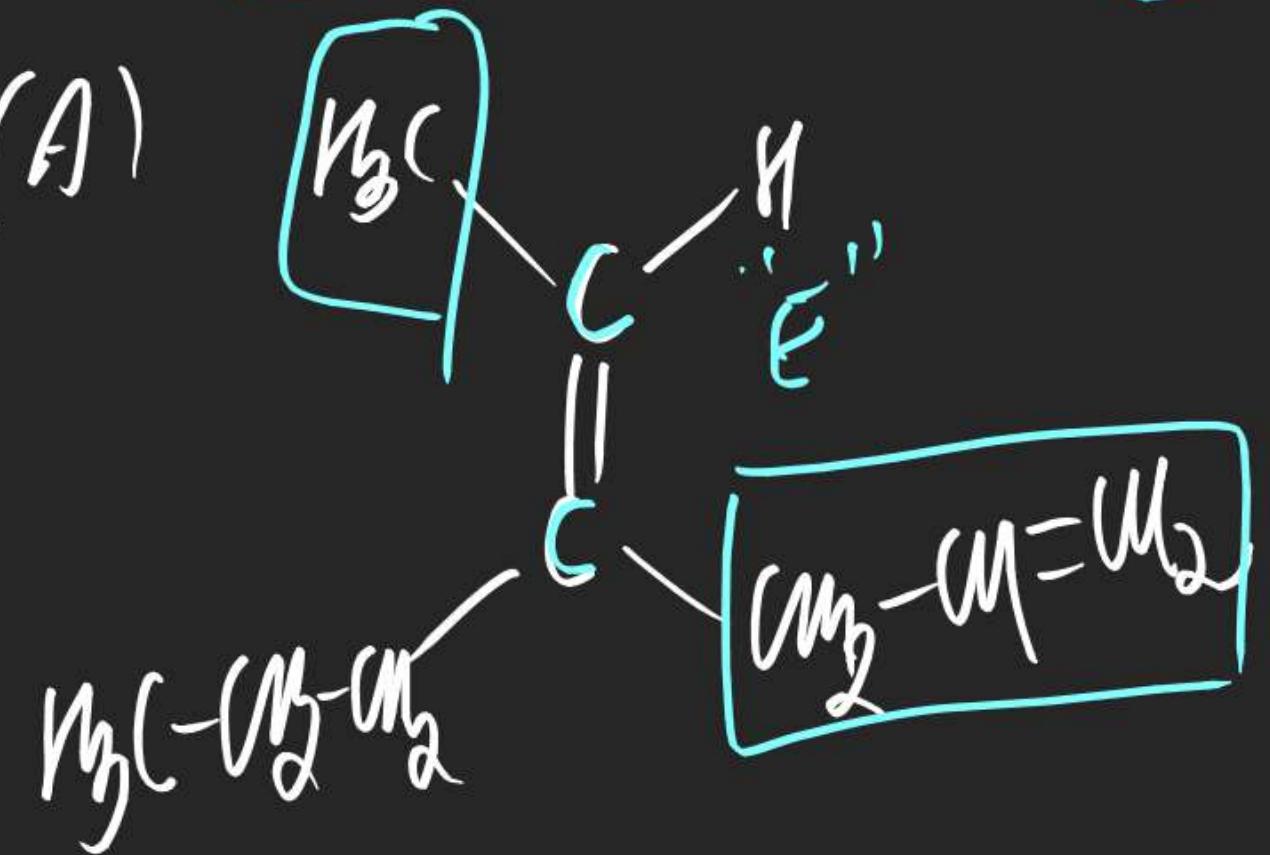


Structural Isomerism

16. The Z-isomer among the following are:



Sol'n (A)



Structural Isomerism

17. Which of the following is/are correct matchings?

- (A) $\text{CH}_3 - \overset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{OH}$ and $\text{H} - \overset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{OCH}_3$ – Metamers
- (B) $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{CH}$ and $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$ – Position iso
- (C) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ and $\text{CH}_3 - \overset{\text{NH}_2}{\underset{|}{\text{CH}}} - \text{CH}_3$ – Tautomers
- (D) $\text{CH}_3\text{CH}_2\text{OH}$ and $(\text{CH}_3)_2\text{O}$ – Functional isomer
-
- Handwritten annotations: Structure A is $\text{CH}_3 - \overset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{OH}$. Structure B is $\text{H} - \overset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{OCH}_3$. Structure C is $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$. Structure D is $\text{CH}_3\text{CH}_2\text{OH}$. Structure E is $(\text{CH}_3)_2\text{O}$. A green arrow points from structure D to structure E, with the handwritten text "Functional isomer" next to it.

Structural Isomerism

?

19. Which of the following has (have) more number of stable conformations than ethyl chloride?

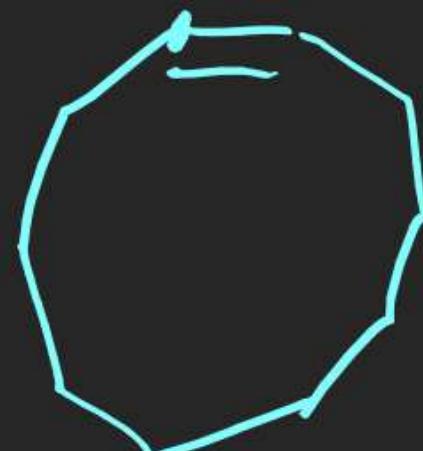
- (A) Butane
- (B) Isopropanol
- (C) n-pentane
- (D) Neohexane

Structural Isomerism

20. Statement-1 : E-cyclodecene is having more ΔH_c (Heat of combustion) than Z isomer. *Correct*

Statement-2 : E-cyclodecene is more stable than Z isomer. *Incorrect*

- (A) Statement- 1 is true, statement- 2 is true and statement- 2 is correct explanation for statement- 1 .
- (B) Statement- 1 is true, statement- 2 is true and statement- 2 is NOT the correct explanation for statement-1.
- Ans* (C) Statement- 1 is true, statement- 2 is false.
- (D) Statement- 1 is false, statement- 2 is true.



Cyclodecene Show *Stability* $Cis > Trans$

HOC & No. of carbon atom \propto *Z > E* \propto *Stability*

HOC

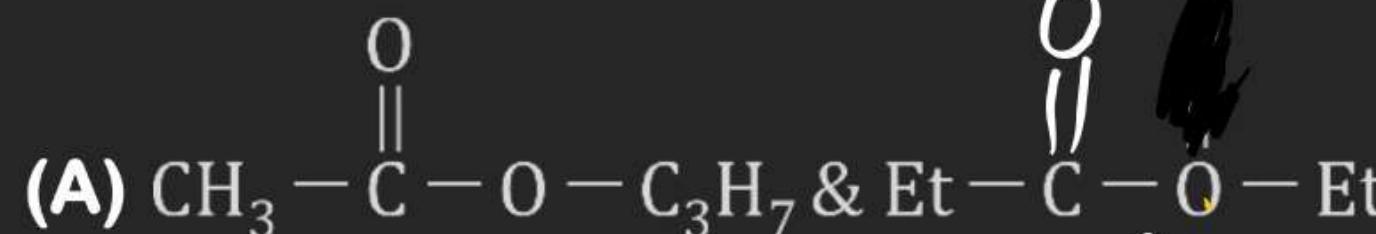
Structural Isomerism

*Structural
Geometrical*

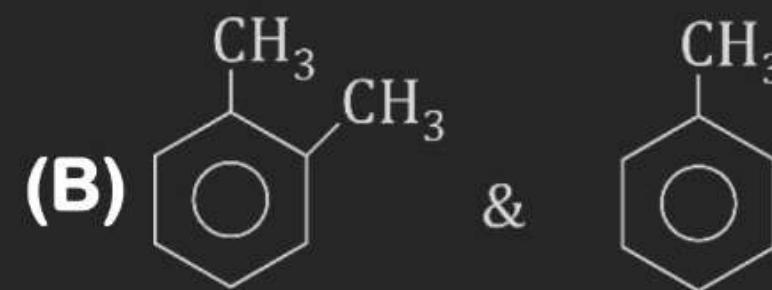
21. Match the Column I with Column II:

Column I (Pair)

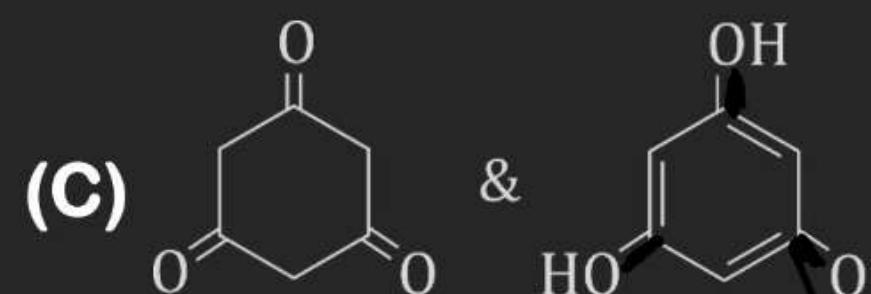
Column II (Relation)



(P) Chain isomer



(Q) Positional isomer



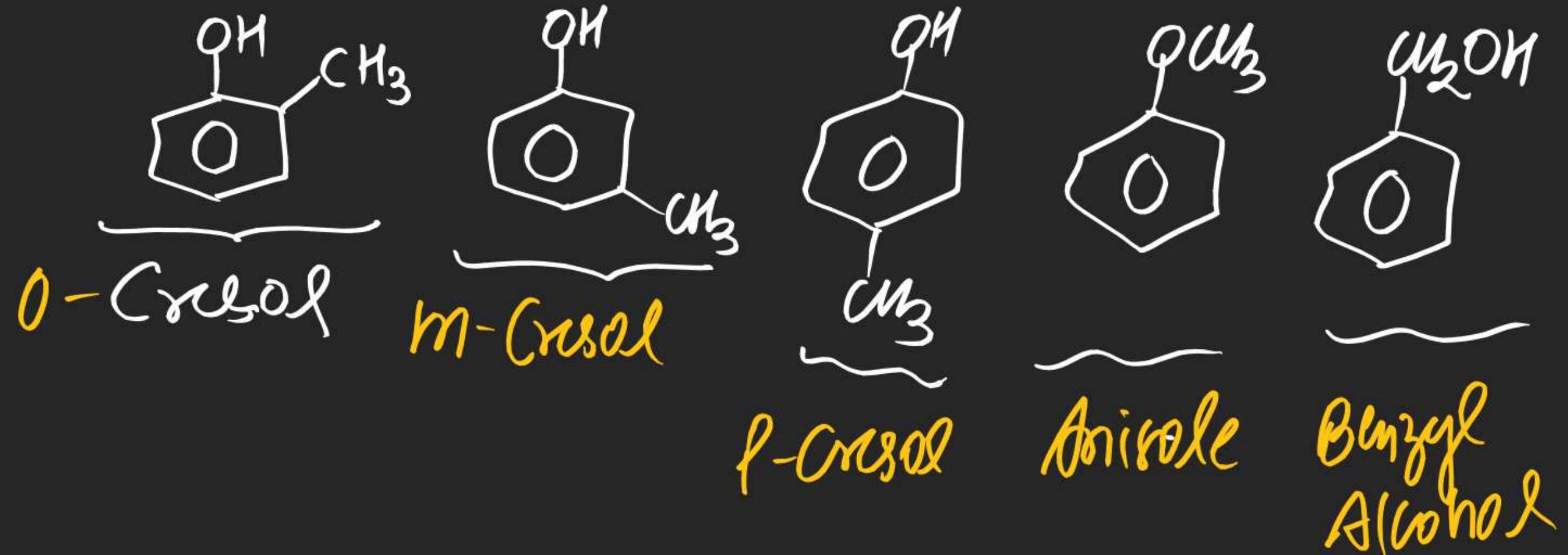
(R) Metamers



(S) Tautomers

Structural Isomerism

1. How many benzenoid isomer are possible for molecular formula of cresol?



Structural Isomerism

4. Calculate the total number of structural isomers of 3° -amines for the molecular formula $C_6H_{15}N$ are?

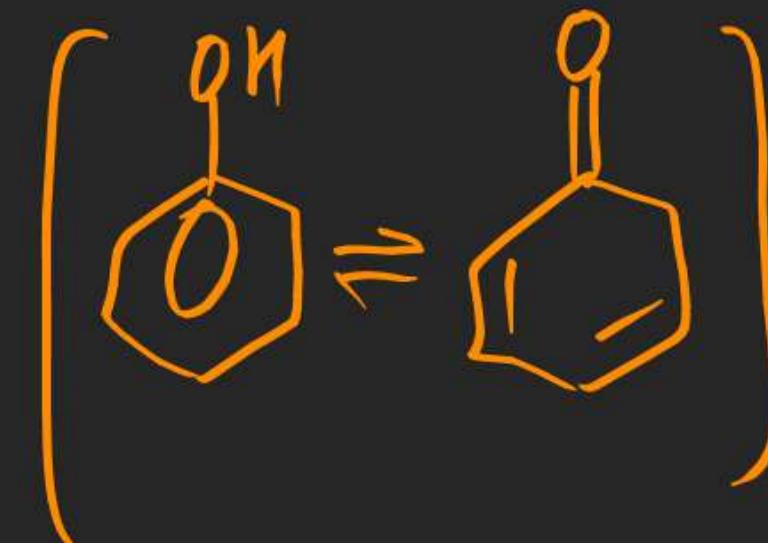
$$DBE = 0$$



Structural Isomerism

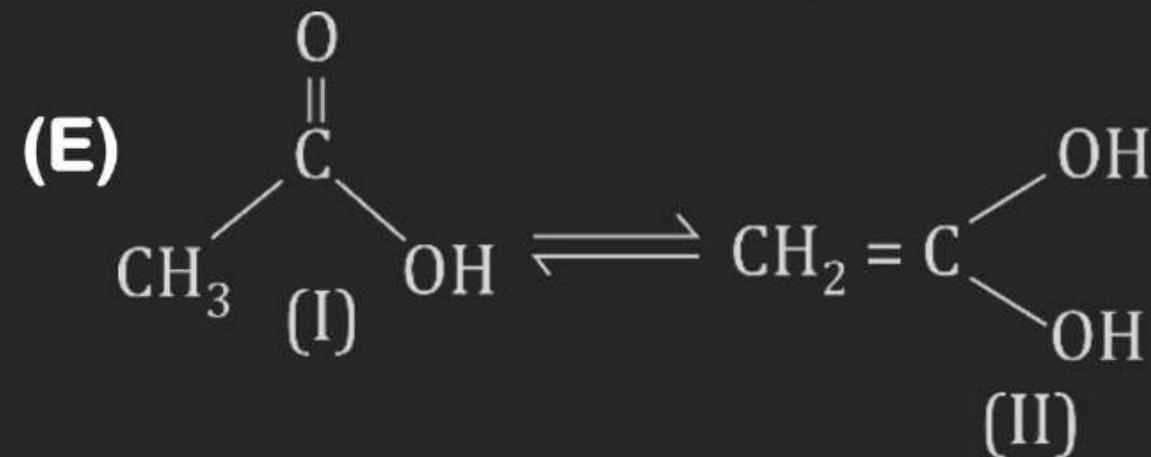
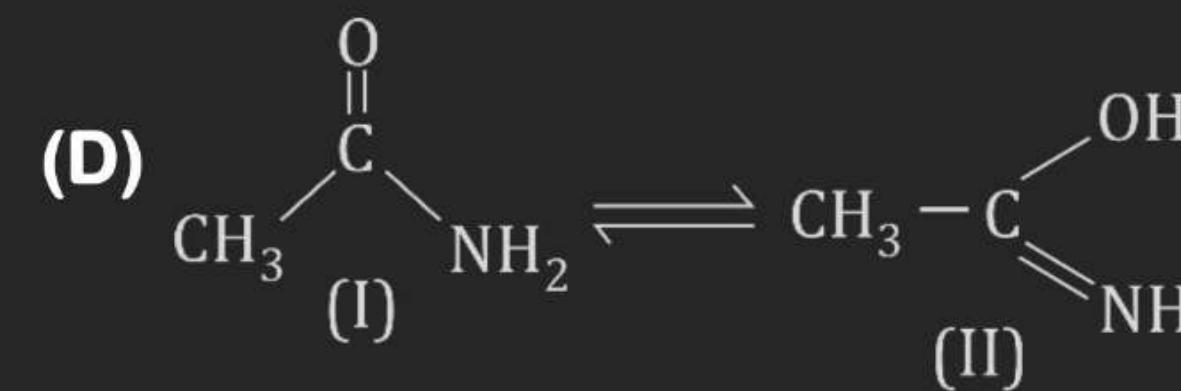
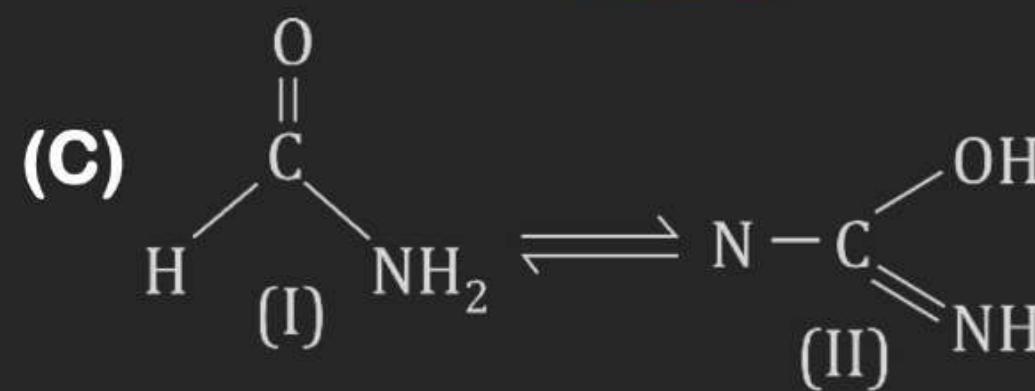
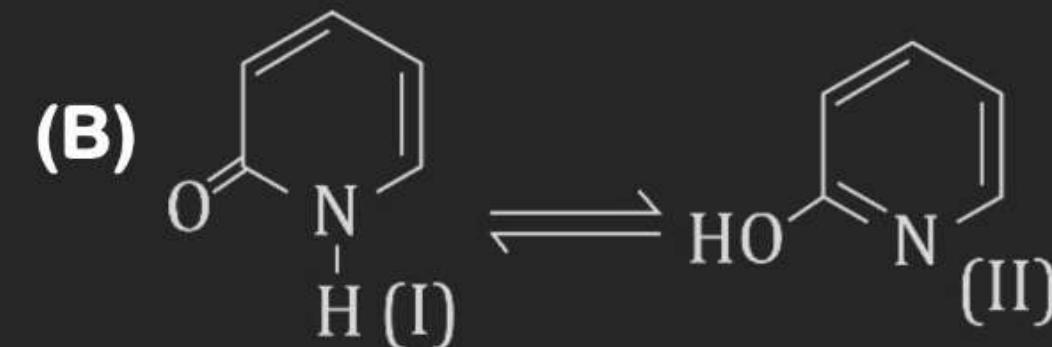
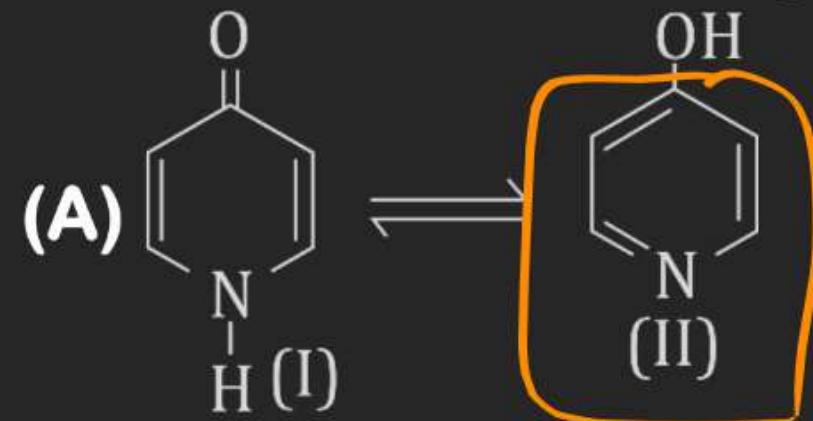
6. Mention the specific type of isomerism exhibited by each of the following pairs:

- (a) 1,2-dichloro ethane and 1,1-dichloro ethane
- (b) Propanoic acid and methyl acetate
- (c) Methyl acetate and ethyl formate
- (d) o-Nitrophenol and P-nitrophenol
- (e) Anisole and o-cresol
- (f) Phenol and Cyclohexa-2,4-dien-1-one



Structural Isomerism

7. In each of the following pairs which is more stable:



Structural Isomerism

9. In each of the following pairs which will have less enol content:

