Nishant Jindal

Structural Isomerism

HW (Discussion) Theory Copy Questions

(7) C_7H_{16} (DOU = 0) All C–C Bonds are single

$\Rightarrow$ 7 Carbon Chain: 1

6 Carbon chain 2

1 ($-CH_3$) Side chain

5 Carbon chain
- 2 ($-CH_3$) Side chain
- 1 ($-CH_2-CH_3$) Side chain 5

4 Carbon chain (3 $-CH_3$ Side chain) 1

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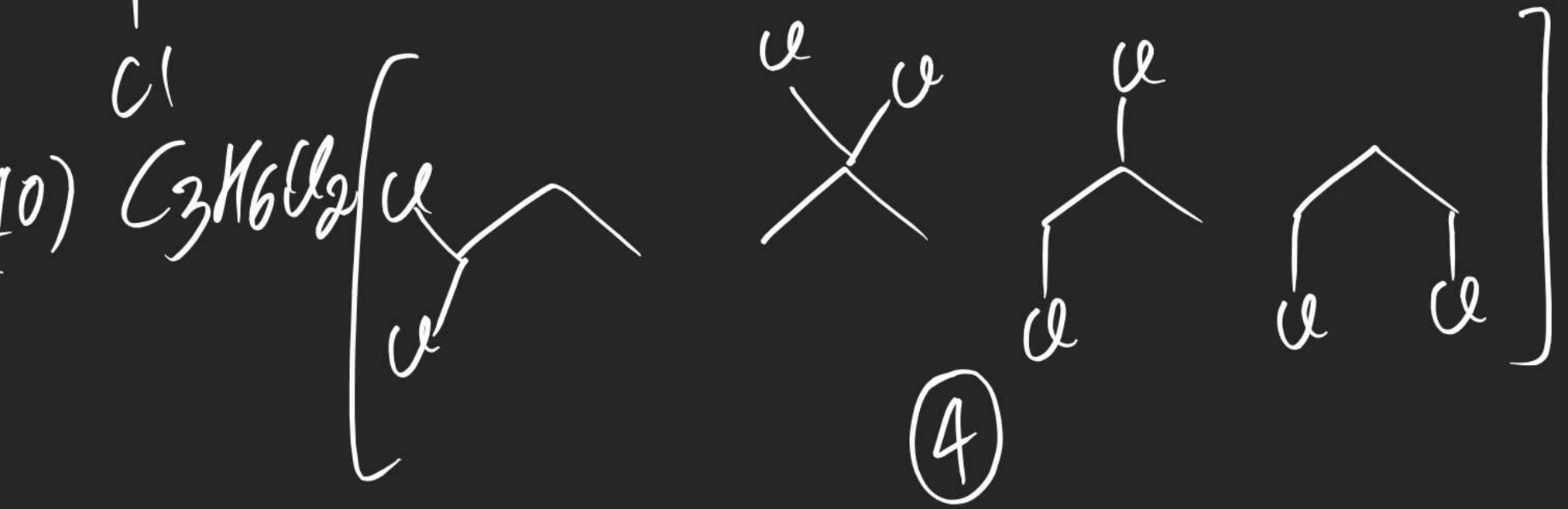
(8) C_3H_7Cl (DOU = 0) All single (C–C) Bond

2

(10) $C_3H_6Cl_2$



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Structural Isomerism

(11) C_3H_9N (DOU = 0) All Single Bonds

$\Longrightarrow$ Compound must have Amine as a functional group.

Primary Amine

$-NH_2$

2 &

Sec. Amine

$-NH-$

$(-NH-CH_3)$

1 &

Tertiary Amine

1 = 4

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Structural Isomerism

(12) $C_4H_{11}N$ (DOU = 0)

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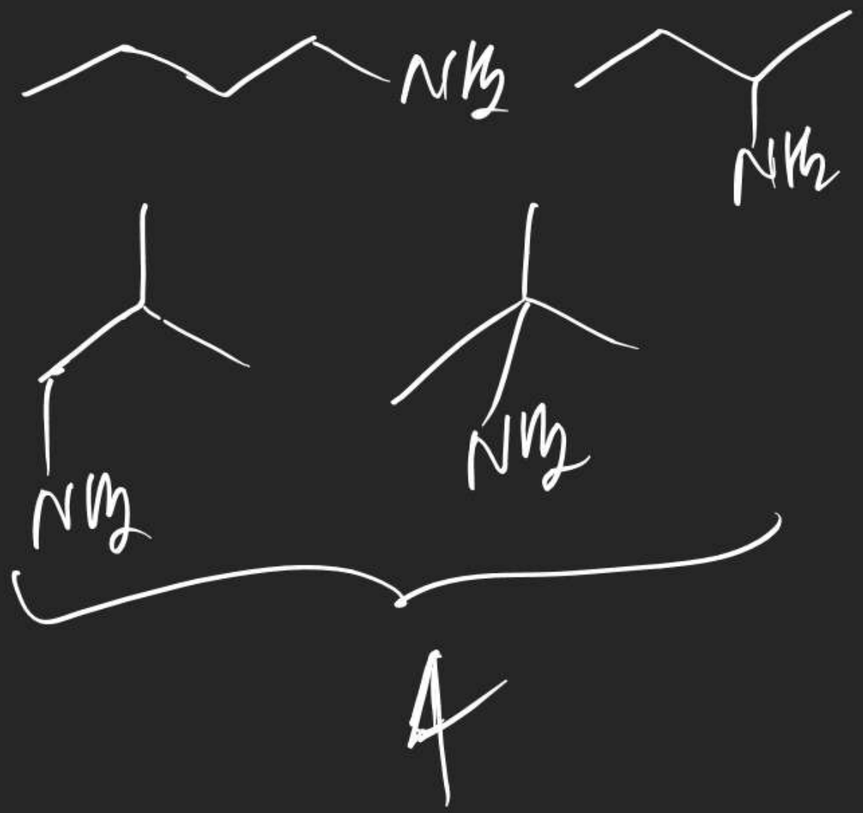
Primary Amine: $(-NH_2)$



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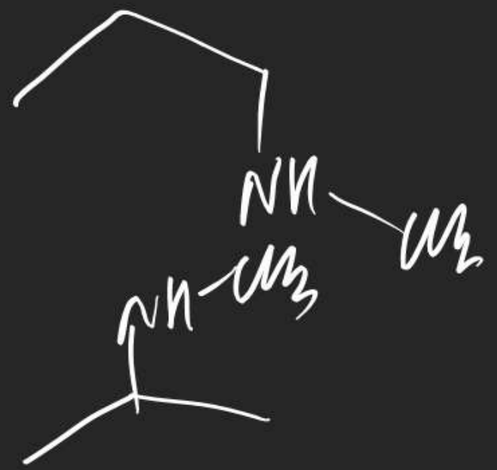
Sec-Amine $(-NH-CH_3)$ & $(-NH-CH_2-CH_3)$

3 1 2 2



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Tertiary Amine

1

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(15) C_3H_6 (DOU = 1)

1 double Bond

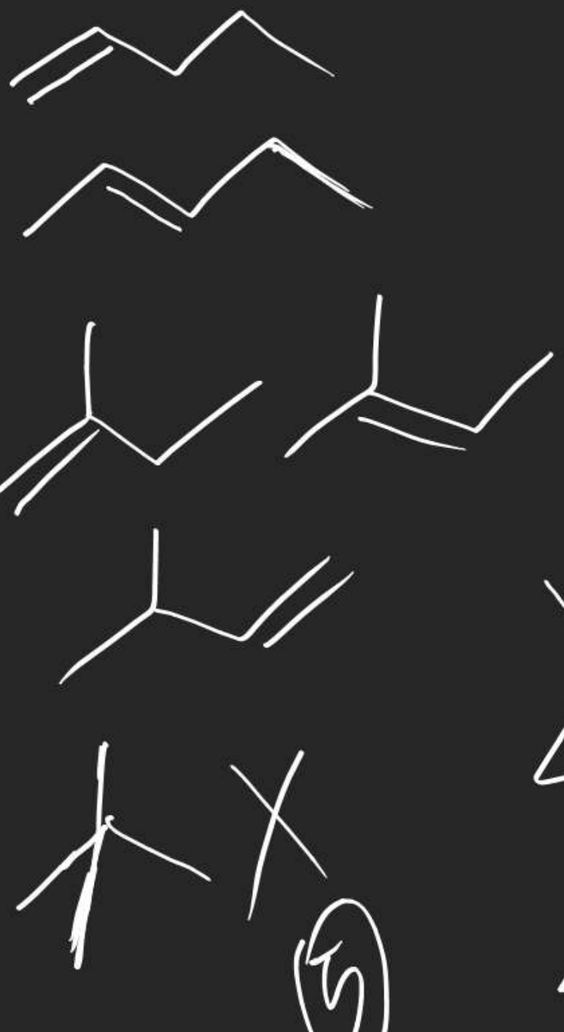
1 Ring

&

2

(16) C_5H_{10} (DOU = 1)

1 double Bond



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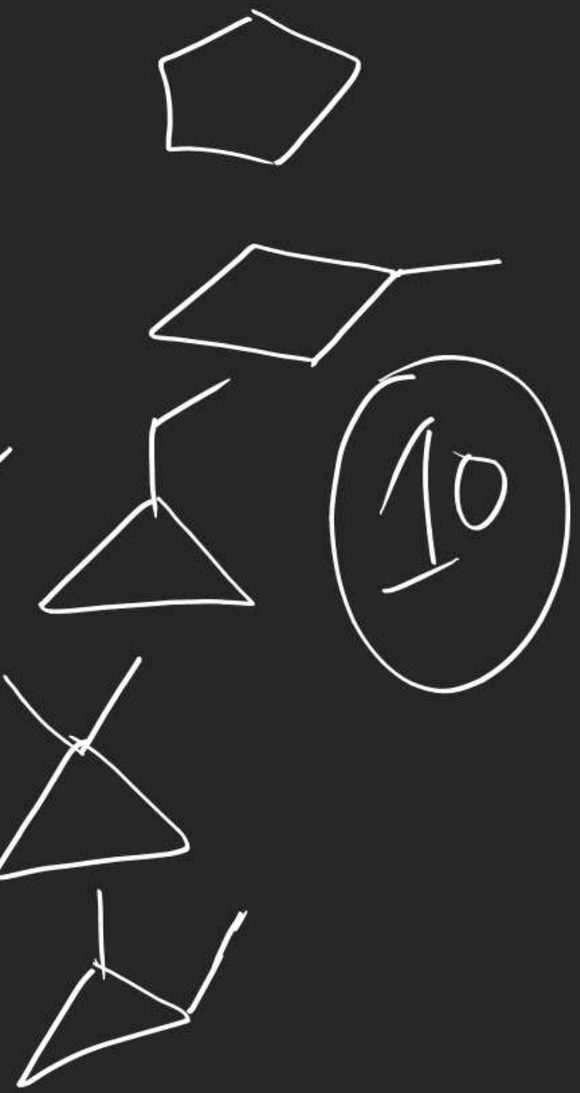
1 Ring



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(17) C_6H_{12} (DOU = 1)

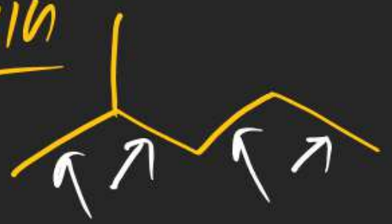
1 double Bond

25

6 Carbon chain

3

5 Carbon chain



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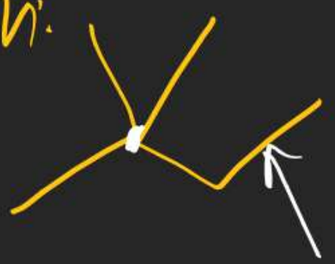
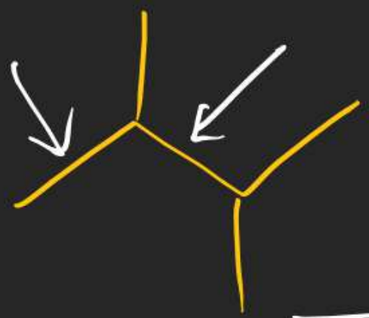
4 Carbon chain:





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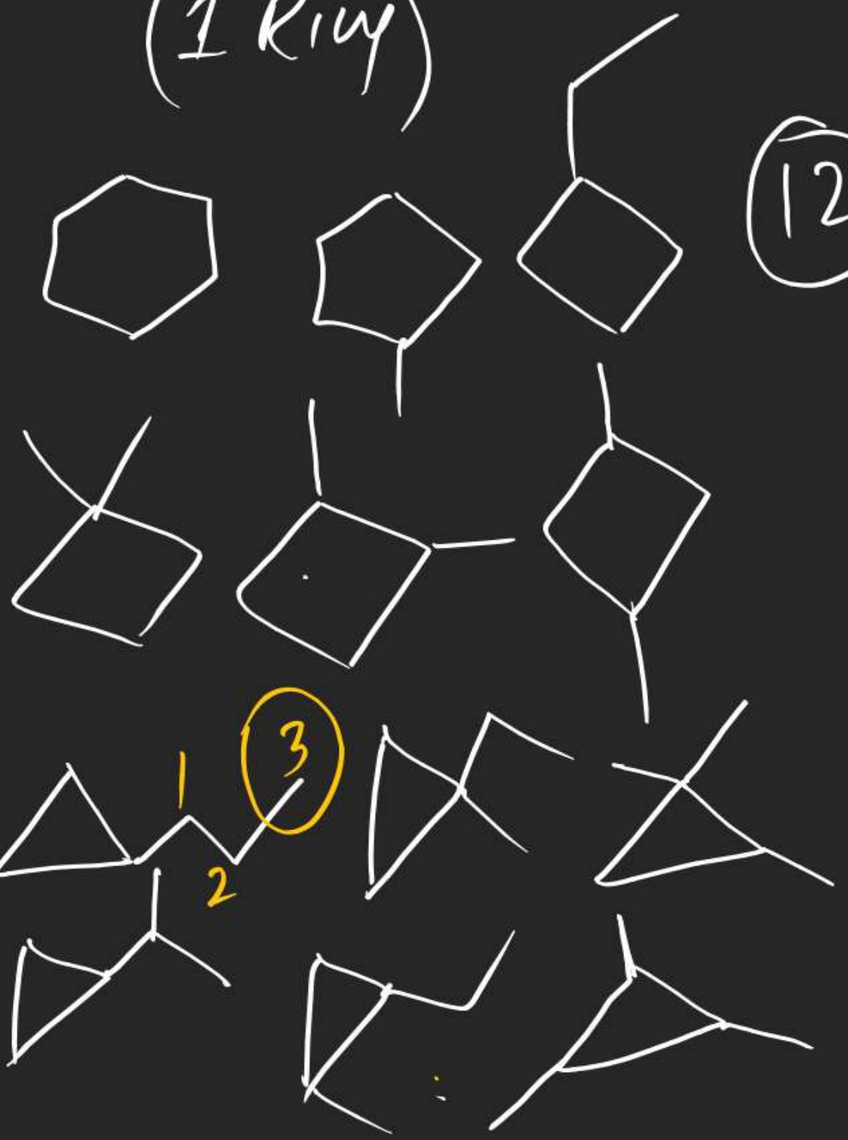
13

(1 Ring)



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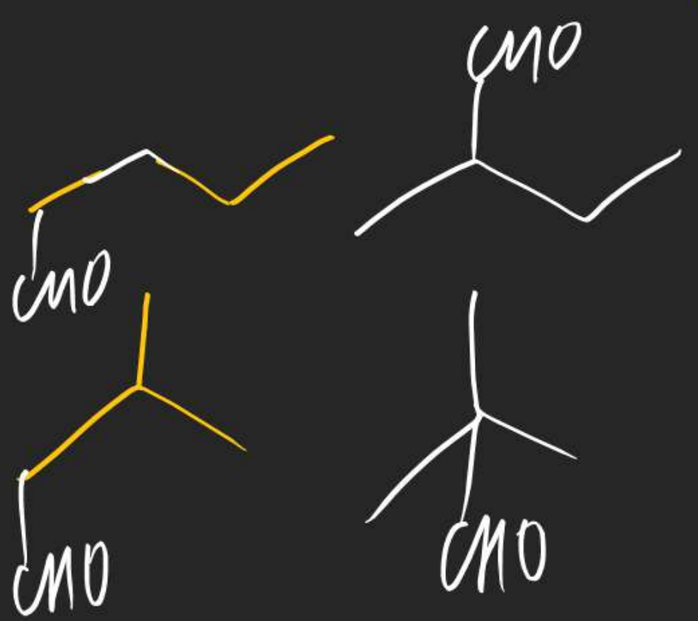
Structural Isomerism

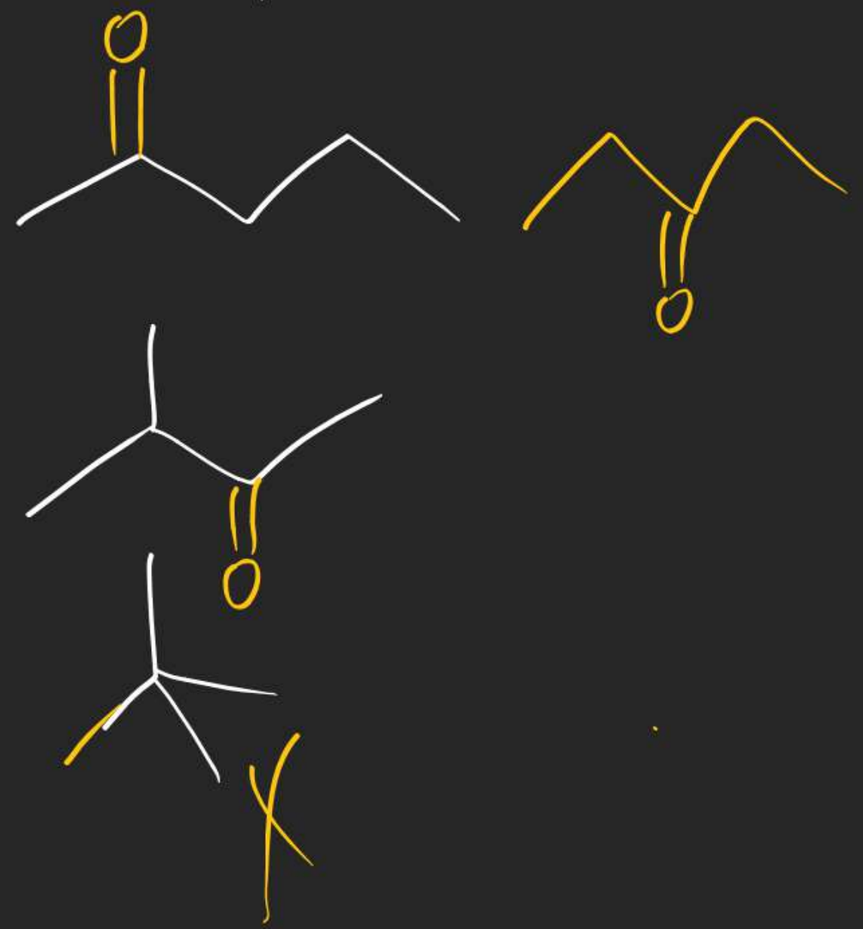
(18) $C_5H_{10}O$ (All aldehyde) (4)

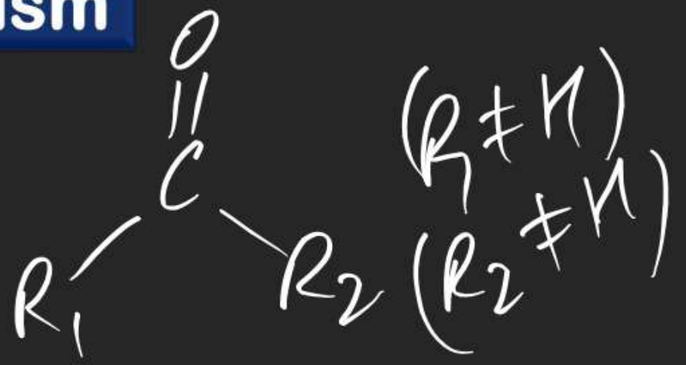
(DOV = 1)

(19)



(3)





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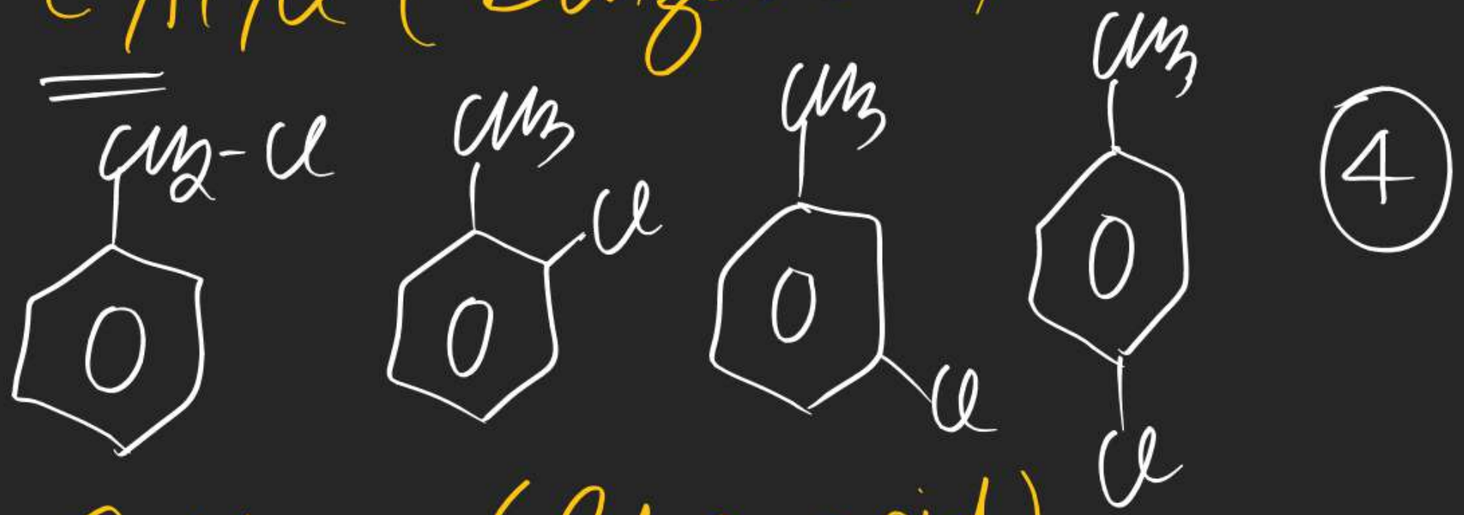
Structural Isomerism

(20) C_7H_7Cl (Benzenoid)



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(21) C_8H_{10} (Benzenoid)

(22) C_6H_3FClBr (Benzenoid)

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Structural Isomerism

Tautomerism

⇒ Tautomers are interconvertible

⇒ Tautomers never can be seprated at Room Temp.

⇒ Tautomers Remain in dynamic equilibrium.

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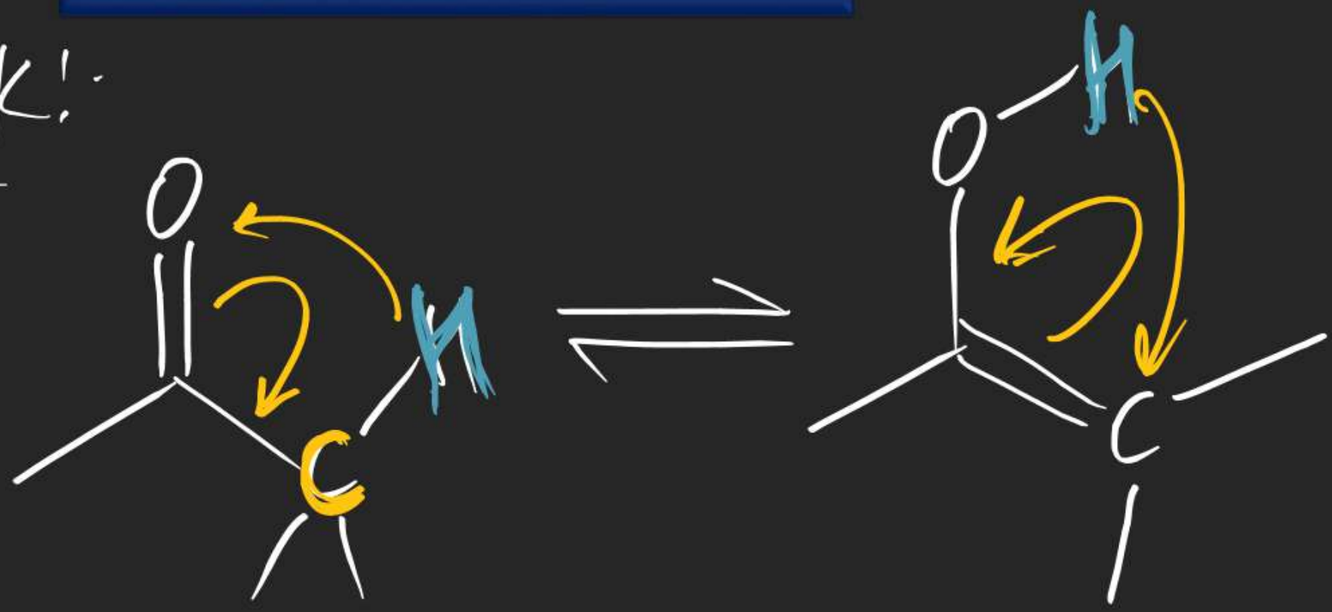
Structural Isomerism

Short trick:



Tautomerism:

Such kind of isomerism arises due to Oscillation of monovalent atom (like H)

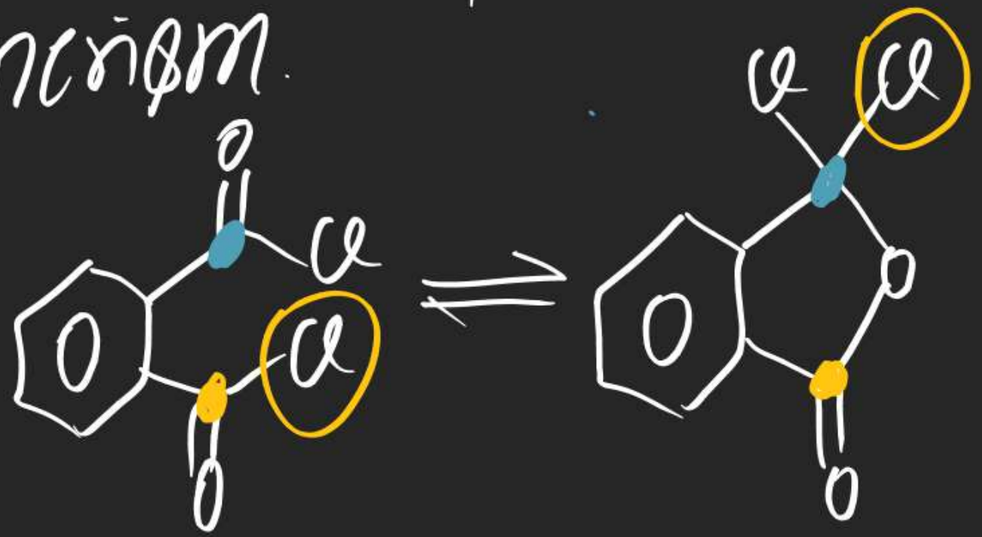
Structural Isomerism

Type of Tautomerism:

(Not in IIT JEE & 11.) There are two type of tautomerism

(1) Anionotropy Tautomerism: when oscillating atom is anion, tautomerism is known as anionotropy tautomerism.

Ex:



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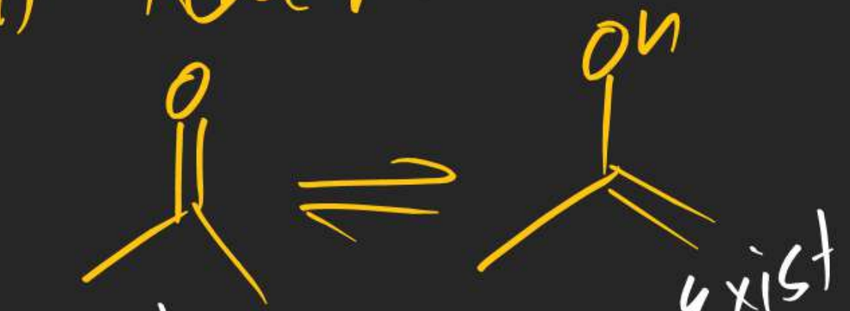
Structural Isomerism

Note:

Tautomerism

(a) Real phenomenon



(b) Exist ⇌ Exist

(Tautomers)

Resonance

Hypothetical

Can't Exist ⟷ Can't Exist

(Resonating Structures)

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Structural Isomerism

(2) Cationotropy Tautomerism: when oscillating atom is a cation, Tautomerism is known as Cationotropy Tautomerism

Type of Cationotropic System

(1) Diad system: when oscillating atom oscillates b/w atom no. 1 to 2 & 2 to 1 then it is known as Diad system.

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Structural Isomerism

Ex:-

① $H-C\equiv N \rightleftharpoons H-\overset{\oplus}{N}\equiv\overset{\ominus}{C}$ (1 2 / 2 1)

② $H-O-N=O \rightleftharpoons H-\overset{\oplus}{N}(=O)-O^{\ominus}$ (1 2 / 2 1)