

GPAT

2027-28



ORGANIC CHEMISTRY

CLASS- 3



TIME- 8 : 30 P.M

CLASSIFICATION OF ORGANIC COMPOUNDS

UPDATED QUESTIONS TILL GPAT 2026

GPAT



VIDEO
LECTURE

+

PDF

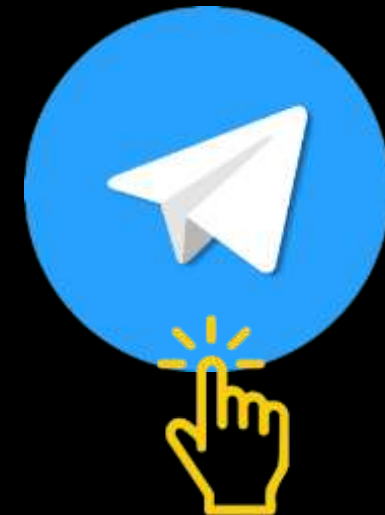


STEP 1 – DOWNLOAD PHARMACY INDIA
MOBILE APP FROM PLAY STORE

STEP 2 – VISIT STORE OPTION – SEARCH
GPAT MANIA – ACCESS PDF + VIDEO

DAILY UPDATES
जुड़िए **PHARMACY INDIA**
के साथ.....

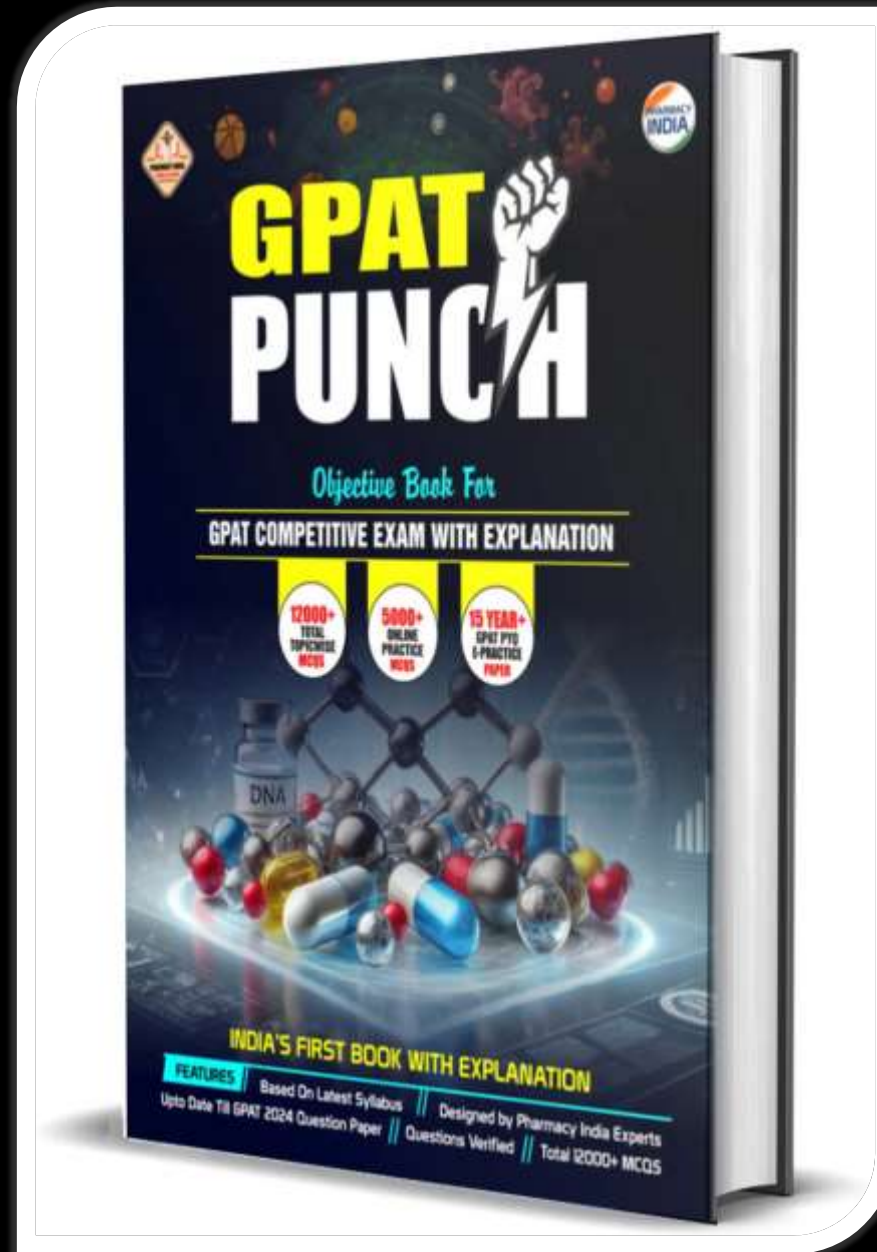
**WHATSAPP & TELEGRAM SE JUDNE KE LIYE
ICONS PAR CLICK KARE**



Best Book for GPAT Exam

AVAILABLE ON

Flipkart  amazon

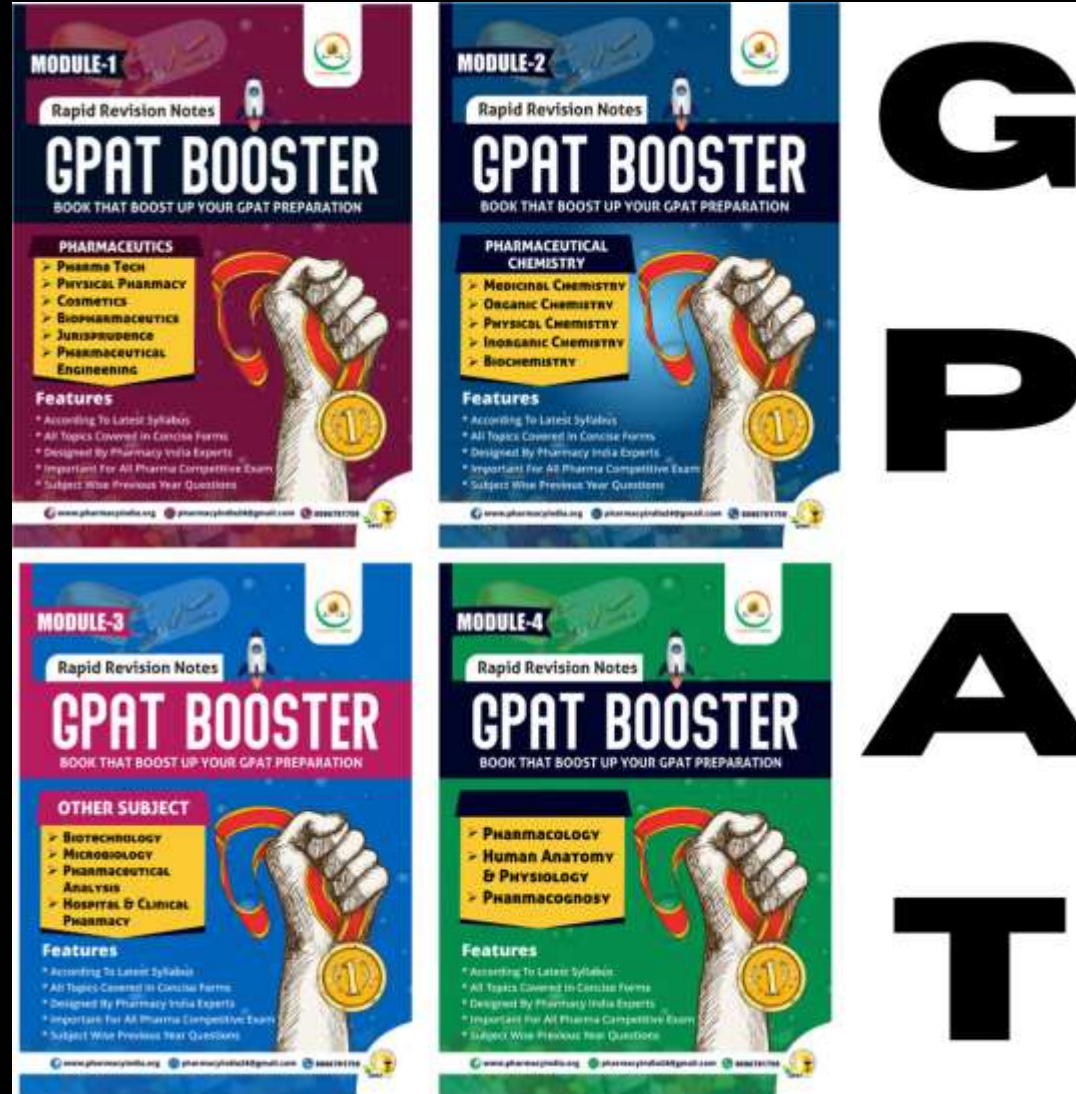


GPAT PUNCH OBJECTIVE BOOK

- Based on Latest Syllabus
- Upto Date Till GPAT 2026 Question Paper
- 5000+ Online Practice MCQs
- Total 12000+ MCQs
- 15 Year+ GPAT PYQ E-Practice Paper

Best Books for GPAT Exam

AVAILABLE ON



GPAT BOOSTER BOOKS

- According to Latest Syllabus
- All Topics Covered in Concise Forms
- Important for GPAT Exam
- Subject-wise Previous Year Questions included
- Includes short notes for rapid last-minute revision



CLASSIFICATION OF ORGANIC COMPOUNDS



BASED ON STRUCTURE



ORGANIC COMPOUNDS



OPEN CHAIN (ACYCLIC / ALIPHATIC)

Carbon atoms arranged in straight or branched chains; no ring present.



CLOSED CHAIN (CYCLIC)

Carbon atoms are joined to form ring structures.

QUICK MEMORY POINTS

- ★ Acyclic = open chain
- ★ Cyclic = ring compound
- ★ Homocyclic = only carbon in ring
- ★ Heterocyclic = ring has N / O / S



HOMOCYCLIC COMPOUNDS

Ring contains only carbon atoms.



HETEROCYCLIC COMPOUNDS

Ring contains carbon plus hetero atoms like N, O, or S.



ALICYCLIC COMPOUNDS

Cyclic but non-aromatic compounds.



AROMATIC COMPOUNDS

Planar conjugated ring systems showing extra stability.



BENZENOID AROMATIC COMPOUNDS

Contain one or more benzene rings.



NON-BENZENOID AROMATIC COMPOUNDS

Aromatic in nature but do not contain a benzene ring.

★ EXAMPLES ★

OPEN CHAIN



PROPANE

ALICYCLIC



CYCLOHEXANE

BENZENOID



BENZENE

HETEROCYCLIC



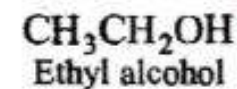
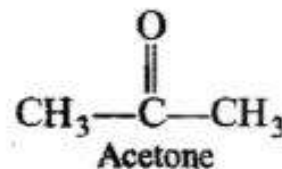
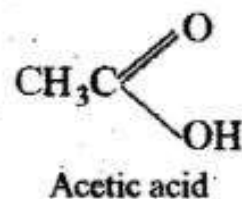
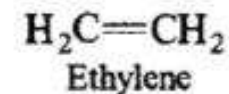
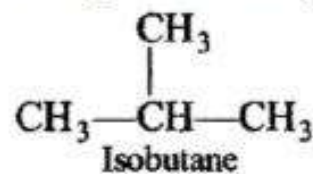
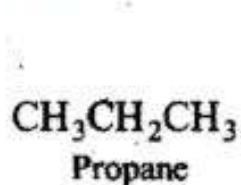
PYRIDINE





1. Acyclic or Open-chain compounds

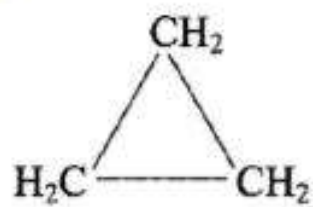
- These are the compounds in which the carbon atoms are linked to each other in such a manner that the molecule is having an open-chain structure.
- The chain of the carbon atoms may be straight or branched.
- These compounds are also called as **aliphatic compounds**.



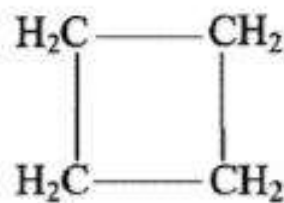


i. Alicyclic compounds

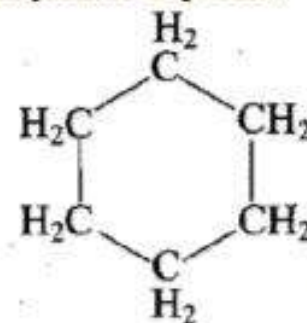
- These are the compounds which contain rings of three or more carbon atoms.
- These resemble with aliphatic compounds than aromatic compounds in many respects.
- That is why these are named alicyclic, i.e. aliphatic cyclic.



Cyclopropane



Cyclobutane



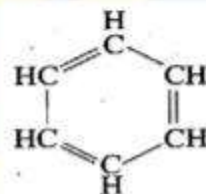
Cyclohexane



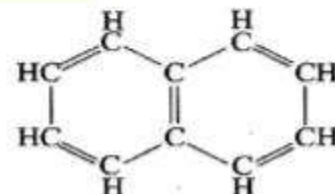


ii. **Aromatic compounds**

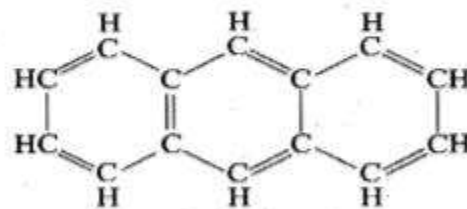
- These compounds consist of at least one benzene ring, *i.e.*, a six-membered carbocyclic ring having alternate single and double bonds.
- Generally, these compounds have some fragrant odour and hence, named as aromatic.



Benzene
(Monocyclic)



Naphthalene
(Bicyclic)



Anthracene
(Tricyclic)





1.

Organic compounds are broadly classified as _____.

- A. Open-chain compounds and acyclic compounds**
- B. Open-chain compounds and linear-chain compounds**
- C. Cyclic compounds and alicyclic compounds**
- D. Cyclic compounds and acyclic compounds**



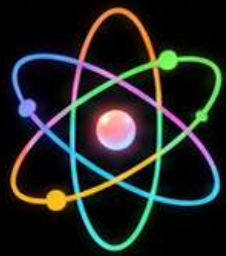


1.

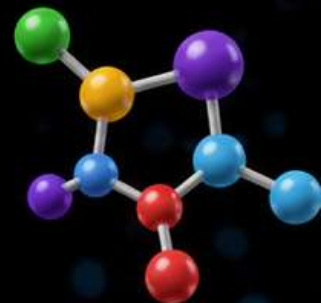
Organic compounds are broadly classified as _____.

- A. Open-chain compounds and acyclic compounds
- B. Open-chain compounds and linear-chain compounds
- C. Cyclic compounds and alicyclic compounds
- D. Cyclic compounds and acyclic compounds**





BROAD CLASSIFICATION OF ORGANIC COMPOUNDS



MAIN DIVISION OF ORGANIC COMPOUNDS



Acyclic / Open-chain
compounds



Cyclic / Closed-chain
compounds



Acyclic: straight
or **branched** chains



Cyclic: ring
structures

... ACYCLIC ...

OPEN-CHAIN COMPOUNDS



STRAIGHT OR
BRANCHED CHAINS



... CYCLIC ...

CLOSED-CHAIN COMPOUNDS



RING STRUCTURES



QUICK TAKEAWAY

Organic compounds are mainly
classified into **acyclic** and **cyclic** compounds.



EXAM POINT

Main classification = **Acyclic** + **Cyclic**





2.

Aliphatic compound is the other name for _____.

- A. Acyclic compounds**
- B. Alicyclic compounds**
- C. Ring compounds**
- D. Closed-chain compounds**





2.

Aliphatic compound is the other name for _____.

- A. Acyclic compounds**
- B. Alicyclic compounds**
- C. Ring compounds**
- D. Closed-chain compounds**





ALIPHATIC = ACYCLIC



Aliphatic compounds are generally **open-chain** compounds



They are also called **acyclic** compounds

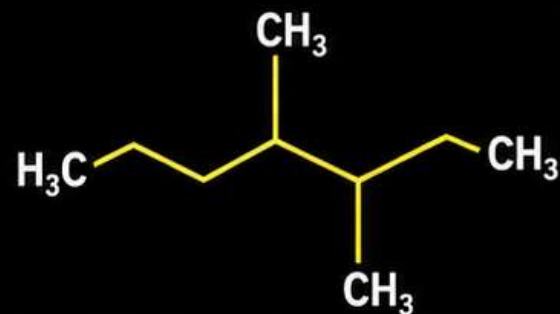


Structure may be **straight-chain** or **branched-chain**



Usually **non-ring** in basic classification

STRUCTURE TYPES



ALIPHATIC
Open-chain

=

ACYCLIC
Non-ring



**QUICK
TAKEAWAY**

Aliphatic = **Open-chain** = **Acyclic**



EXAM POINT

Aliphatic compounds are **open-chain** compounds.





3.

Which among the following is not an example of acyclic compound?

A. Acetaldehyde

B. Ethane

C. Cyclopropane

D. Isobutane





3.

Which among the following is not an example of acyclic compound?

A. Acetaldehyde

B. Ethane

C. Cyclopropane

D. Isobutane



Download Pharmacy India Mobile App from Playstore



CYCLOPROPANE IS CYCLIC



Acyclic compounds do not contain rings



Cyclopropane has a three-membered ring



Therefore it is a **cyclic compound**



Open-chain examples: ethane, isobutane, acetaldehyde



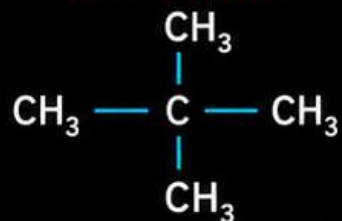
Quick takeaway: Ring present = **cyclic**, not **acyclic**

OPEN-CHAIN EXAMPLES (ACYCLIC)

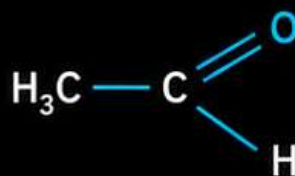
ETHANE



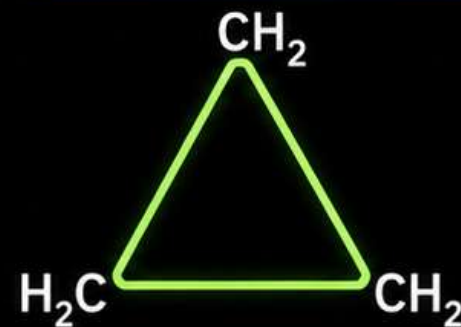
ISOBUTANE



ACETALDEHYDE



CYCLOPROPANE



Three-membered ring



EXAM POINT

Cyclopropane contains a **ring** structure.





4.

Which among the following is not an example of alicyclic compound?

- A. Cyclohexane
- B. Cyclohexene
- C. Tetrahydrofuran
- D. Acetic acid





4.

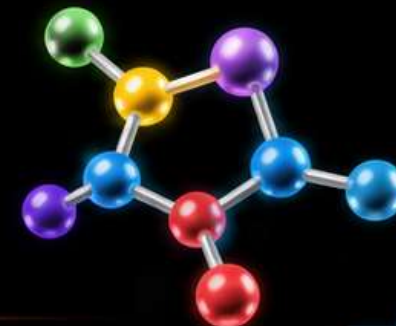
Which among the following is not an example of alicyclic compound?

- A. Cyclohexane
- B. Cyclohexene
- C. Tetrahydrofuran
- D. Acetic acid**

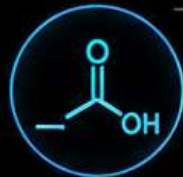




ACETIC ACID IS OPEN-CHAIN



Alicyclic compounds
contain ring structures



Acetic acid is a
carboxylic acid with
open-chain structure



It does **not contain** a **ring**



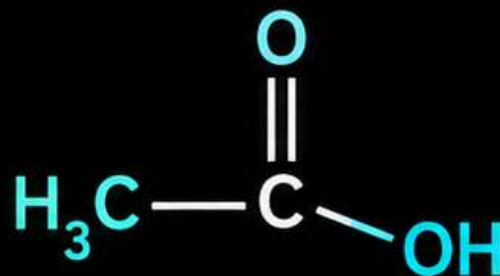
So it is **not an**
alicyclic compound



Quick takeaway:
No ring = not alicyclic

ACETIC ACID

OPEN-CHAIN STRUCTURE



Acetic acid = no ring

VS

ALICYCLIC EXAMPLES

CONTAIN RING STRUCTURES



Alicyclic = ring



EXAM
POINT



Acetic acid is an **open-chain**
carboxylic acid.





5.

Which among the following is not an aromatic compound in specific classification?

A. Naphthalene

B. Aniline

C. Pyridine

D. Tropolone



Download Pharmacy India Mobile App from Playstore



5.

Which among the following is not an aromatic compound in specific classification?

A. Naphthalene

B. Aniline

C. Pyridine

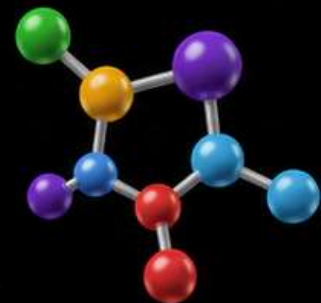
D. Tropolone



Download Pharmacy India Mobile App from Playstore



PYRIDINE: HETEROCYCLIC AROMATIC



Pyridine contains **nitrogen** in the ring



It is **aromatic**, but classified separately as **heterocyclic aromatic**



It is **not grouped** with simple aromatic examples in this specific classification



Key idea: heteroatom in ring changes classification



QUICK TAKEAWAY:

Pyridine = **heterocyclic aromatic** compound

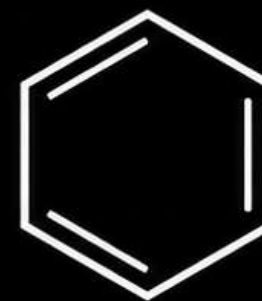
PYRIDINE



NITROGEN IN RING

VS

BENZENE



SIMPLE AROMATIC
(CARBOCYCLIC)



PYRIDINE IS **NOT GROUPED** WITH SIMPLE AROMATICS



EXAM POINT

Nitrogen in ring → **heterocyclic aromatic**.





6. Find the odd one among the following.

- A. Alicyclic compounds**
- B. Heterocyclic compounds**
- C. Branched-chain compounds**
- D. Aromatic compounds**





6. Find the odd one among the following.

A. Alicyclic compounds

B. Heterocyclic compounds

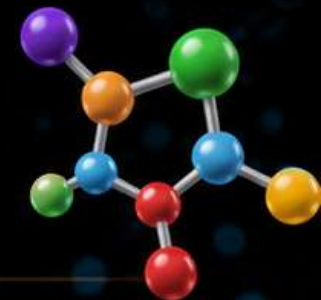
C. Branched-chain compounds

D. Aromatic compounds





BRANCHED-CHAIN = ACYCLIC



ALICYCLIC



Alicyclic
compounds are
cyclic

HETEROCYCLIC



Heterocyclic
compounds are
cyclic

AROMATIC



Aromatic
compounds are
cyclic

BRANCHED-CHAIN



Branched-chain
compounds are
open-chain / acyclic



QUICK TAKEAWAY



Branched-chain is
different from **cyclic**
categories.



EXAM POINT

Branched-chain compounds
belong to **acyclic** class.





7. Identify the odd one among the following.

A. Indene

B. Anthracene

C. o, m, p-Xylene

D. Azulene





7. Identify the odd one among the following.

A. Indene

B. Anthracene

C. o, m, p-Xylene

D. Azulene



Download Pharmacy India Mobile App from Playstore



AZULENE = NON-BENZENOID



Azulene is a **non-benzenoid** aromatic compound



It shows **aromatic character** without a benzene ring pattern



Indene, anthracene, and xylene are **benzenoid** aromatic compounds

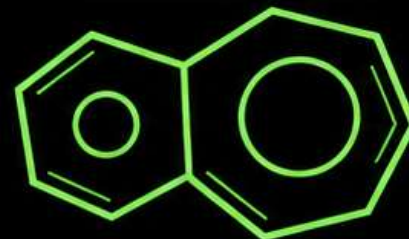


So azulene is the **odd one** in this group



Quick takeaway:
Azulene differs by **non-benzenoid** aromaticity

AZULENE



• **NON-BENZENOID AROMATIC** •

BENZENOID AROMATIC COMPOUNDS



INDENE



ANTHRACENE



XYLENE



EXAM POINT

Azulene is **non-benzenoid** aromatic.





8.

Organic compounds can be classified based upon functional groups.

Identify the one which is not a functional group.

A. Isocyanide

B. Isocyano

C. Carboxyl

D. Carbonyl



Download Pharmacy India Mobile App from Playstore



8.

Organic compounds can be classified based upon functional groups.

Identify the one which is not a functional group.

A. Isocyanide

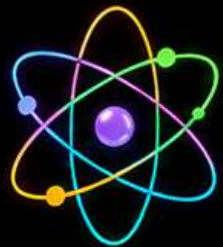
B. Isocyano

C. Carboxyl

D. Carbonyl



Download Pharmacy India Mobile App from Playstore



ISOCYANIDE $\neq$ FUNCTIONAL GROUP



Functional groups define
chemical reactivity



Isocyano, carboxyl, and
carbonyl are **functional groups**



Isocyanide refers to
a **class of compounds**



Therefore it is **not** treated
here as a **functional group**



**QUICK
TAKEAWAY**

Isocyanide = **compound class**,
not functional group

· << FUNCTIONAL GROUPS >> ·

ISOCYANO



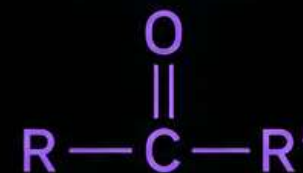
Isocyano

CARBOXYL



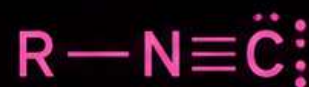
Carboxyl

CARBONYL



Carbonyl

<< **ISOCYANIDE** >>



Refers to a
class of compounds



EXAM POINT

Know the difference between
functional group and **compound class**.





9.

Which among the following is not a class of organic compound?

A. Carbonyl compound

B. Nitro compound

C. Amides

D. Electro compounds





9.

Which among the following is not a class of organic compound?

A. Carbonyl compound

B. Nitro compound

C. Amides

D. Electro compounds





ELECTRO COMPOUNDS: NOT STANDARD



- Organic compounds are commonly grouped into **standard classes**



- Carbonyl compounds** are a valid class



- Nitro compounds** are a valid class



- Amides** are a valid class



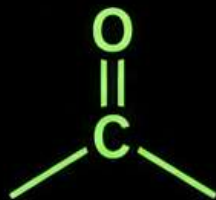
- “**Electro compounds**” is not a standard class of organic compounds



QUICK TAKEAWAY:

Electro compounds is **not** a recognized class here.

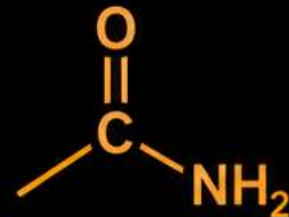
CARBONYL COMPOUNDS



NITRO COMPOUNDS



AMIDES



ELECTRO COMPOUNDS



EXAM POINT

Use standard functional-group based classes.





10. Which among these is not associated with aliphatic compounds?

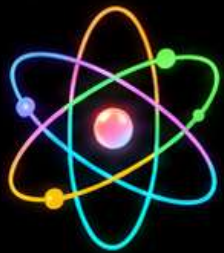
- A. They contain $(4n + 2)$ pi electrons**
- B. Contain straight-chain compounds**
- C. Contain branched-chain compounds**
- D. Has appropriate number of H-atoms and functional groups**





- 10. Which among these is not associated with aliphatic compounds?**
- A. They contain $(4n + 2)$ pi electrons**
 - B. Contain straight-chain compounds**
 - C. Contain branched-chain compounds**
 - D. Has appropriate number of H-atoms and functional groups**





$4n + 2$ RULE $\rightarrow$ AROMATIC



Aliphatic compounds include **straight-chain compounds**



They also include **branched-chain compounds**



They have suitable **hydrogen atoms** and **functional groups**



The **$(4n + 2)$ π electron rule** belongs to **aromatic** compounds



It is not associated with **aliphatic compounds**

ALIPHATIC (OPEN-CHAIN)



Straight or branched chains

VS

AROMATIC



$4n + 2 \pi$
(Hückel Rule)



**QUICK
TAKEAWAY**



$4n + 2$ rule =
aromaticity, not aliphaticity



EXAM POINT

Hückel rule is for **aromatic** compounds.





@PharmacyIndia



11.

Find the odd one out.

A. Aromatic

B. Alkanes

C. Alkynes

D. Alkenes



Download Pharmacy India Mobile App from Playstore



@PharmacyIndia



11.

Find the odd one out.

A. Aromatic

B. Alkanes

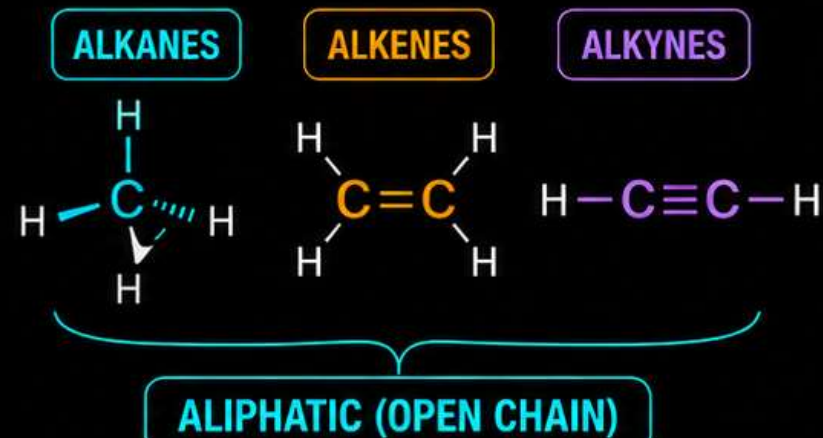
C. Alkynes

D. Alkenes



Download Pharmacy India Mobile App from Playstore

Odd One Out: Aromatic



Planar
Cyclic
Delocalized π
Electrons



KEY TAKEAWAY

Aromatic compounds are structurally different from aliphatic hydrocarbons.





12.

Compounds which have different arrangements of atoms in space while having same atoms bonded to each other are said to have _____.

- A. Position isomerism
- B. Functional group isomerism
- C. Chain isomerism
- D. Stereoisomerism



Download Pharmacy India Mobile App from Playstore



12.

Compounds which have different arrangements of atoms in space while having same atoms bonded to each other are said to have _____.

- A. Position isomerism
- B. Functional group isomerism
- C. Chain isomerism
- D. Stereoisomerism**



Download Pharmacy India Mobile App from Playstore

Stereoisomerism

- Same connectivity



- Different spatial arrangement of atoms



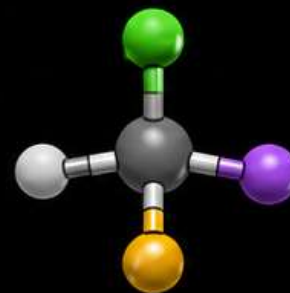
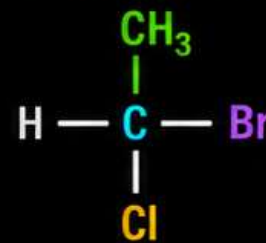
- Same bonds, different 3D arrangement



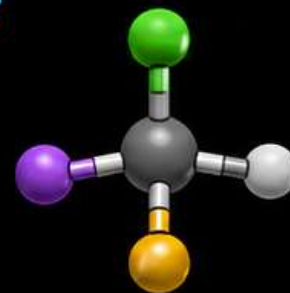
- This is called stereoisomerism



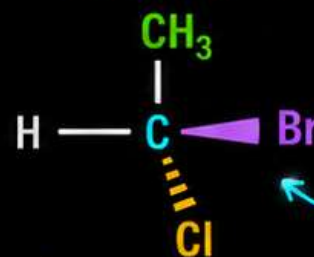
Same connectivity



Mirror

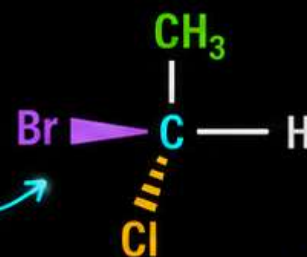


Different spatial arrangement



Same bonds

Different 3D arrangement



Stereoisomers

KEY TAKEAWAY

Molecules with same connectivity can exist as different 3D arrangements.





13. Which of the following can make difference in optical isomers?

A. Heat

B. Temperature

C. Polarized light

D. Pressure





13. Which of the following can make difference in optical isomers?

A. Heat

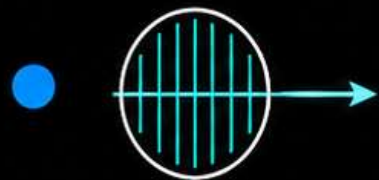
B. Temperature

C. Polarized light

D. Pressure



Optical Isomers



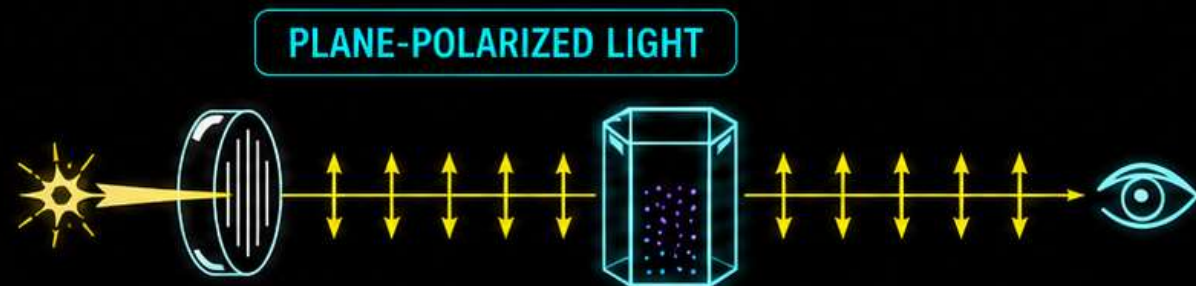
Optical isomers **interact** with plane-polarized light



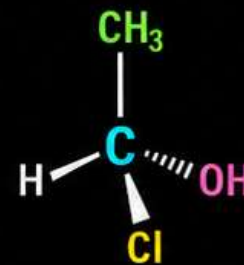
They **rotate** polarized light in **different directions**



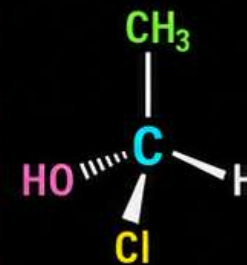
Polarized light **helps distinguish** them



ROTATES LEFT (-)



ROTATES RIGHT (+)



KEY TAKEAWAY

Optical isomers **rotate** plane-polarized light in **opposite directions**.





14. The nature of linkage in organic compounds is generally

_____.

- A. Ionic
- B. Covalent
- C. Co-ordinate covalent
- D. Metallic bond





14. The nature of linkage in organic compounds is generally

_____.

A. Ionic

B. Covalent

C. Co-ordinate covalent

D. Metallic bond



Download Pharmacy India Mobile App from Playstore

Nature of Linkage

Organic compounds mainly contain **covalent bonds**

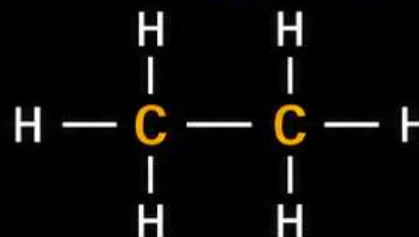
Carbon **shares electrons** with other atoms

Covalent bonding **gives stable** organic molecules

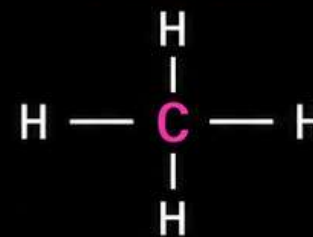
Shared electron pair (covalent bond)



C-C single bond



C-H bond



Electrons



Sharing



Covalent Bond



Strong & Stable



Organic Framework



Basis of Life

KEY TAKEAWAY

Covalent bonding is the **foundation** of **organic chemistry**.





15.

Which of the following is an aromatic heterocyclic compound?

A. Pyrrole

B. Pyrrolidine

C. Epoxyethane

D. Dioxane





15.

Which of the following is an aromatic heterocyclic compound?

A. Pyrrole

B. Pyrrolidine

C. Epoxyethane

D. Dioxane



Pyrrole

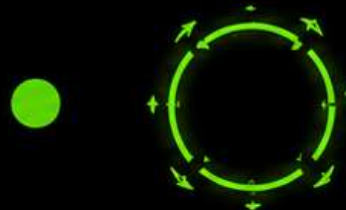
Aromatic heterocyclic compound



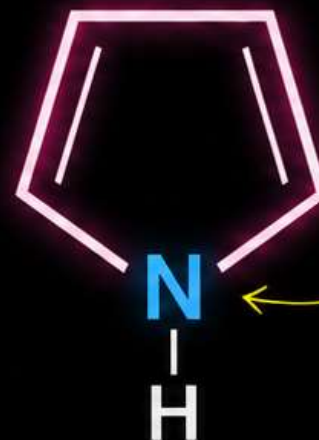
Five-membered ring



Contains one nitrogen atom

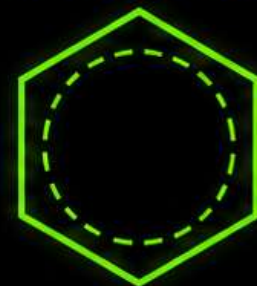


Delocalized electrons make it aromatic



Nitrogen contributes one lone pair to π system

Aromatic ring



6 π electrons (Hückel's rule)

Examples of heterocycles



KEY TAKEAWAY

Pyrrole is a five-membered aromatic heterocycle with one nitrogen.





16. Which of the following is not a carbocyclic compound?

A. Cyclopentane

B. Naphthalene

C. Thiophene

D. Benzene



Download Pharmacy India Mobile App from Playstore



16. Which of the following is not a carbocyclic compound?

A. Cyclopentane

B. Naphthalene

C. Thiophene

D. Benzene



Download Pharmacy India Mobile App from Playstore

Thiophene

Not a carbocyclic compound



Carbocyclic rings
contain only carbon atoms



Thiophene contains
sulfur in the ring



So, thiophene is
heterocyclic

BENZENE (CARBOCYCLIC)



All atoms = Carbon (C)
→ Carbocyclic

THIOPHENE (HETEROCYCLIC)



Contains Sulfur (S)
→ Heterocyclic

RING SYSTEMS



Benzene
(Carbocyclic)



Cyclohexane
(Carbocyclic)



Thiophene
(Heterocyclic)



Furan
(Heterocyclic)



Pyridine
(Heterocyclic)

KEY TAKEAWAY

Thiophene is not carbocyclic because it contains sulfur in the ring.





17.

Which of the following does not contain fused benzene rings?

A. Naphthalene

B. Anthracene

C. Diphenyl

D. Furan



Download Pharmacy India Mobile App from Playstore



17.

Which of the following does not contain fused benzene rings?

A. Naphthalene

B. Anthracene

C. Diphenyl

D. Furan



Download Pharmacy India Mobile App from Playstore

Diphenyl

Rings *linked*, *not fused*



Given answer: **Diphenyl**



Two **benzene rings**
joined by a **single bond**

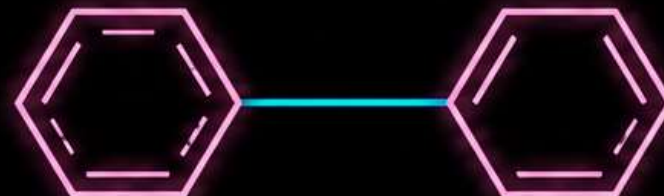


The rings are **separate**,
not **fused**



Fused-ring systems
share **common sides**

DIPHENYL



Two benzene rings joined
by a **single bond**

FUSED-RING EXAMPLE



e.g., Naphthalene
Rings share
a **common side**

KEY TAKEAWAY

Diphenyl = two benzene rings **linked** by a **single bond**, **not fused**.





18. What is the other name for acyclic compounds?

A. Aliphatic

B. Aromatic

C. Heterocyclic

D. Alicyclic



Download Pharmacy India Mobile App from Playstore



18. What is the other name for acyclic compounds?

A. Aliphatic

B. Aromatic

C. Heterocyclic

D. Alicyclic



Download Pharmacy India Mobile App from Playstore

Acyclic = Aliphatic



Acyclic compounds are **open-chain** compounds

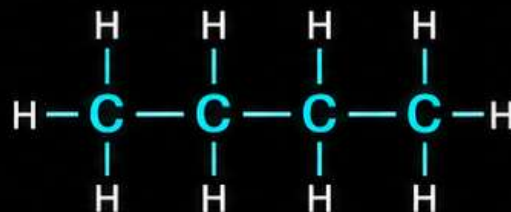


They are also called **aliphatic** compounds

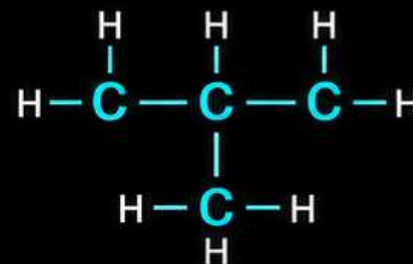


Chains may be **straight** or **branched**

OPEN CHAIN (ACYCLIC)



STRAIGHT CHAIN



BRANCHED CHAIN



STRAIGHT



BRANCHED

OPEN CHAIN



KEY TAKEAWAY

Acyclic = **Open chain** = **Aliphatic** | **Straight** or **branched**, but **never** cyclic





19. Which of these is not an aliphatic compound?

- A. Acetic acid**
- B. Acetaldehyde**
- C. Ethane**
- D. Tetrahydrofuran**





19. Which of these is not an aliphatic compound?

A. Acetic acid

B. Acetaldehyde

C. Ethane

D. Tetrahydrofuran



Tetrahydrofuran

• Not an aliphatic compound •



Tetrahydrofuran is a **cyclic ether**



It contains a **heterocyclic ring**



It is **not an open-chain aliphatic compound**

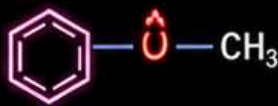
ETHER FAMILY



Dimethyl ether



Diethyl ether



Methyl phenyl ether (Anisole)



Tetrahydrofuran (THF)

TETRAHYDROFURAN (THF)



- ✓ 5-membered ring
- ✓ Contains **oxygen**
- ✓ Cyclic **ether**

CYCLIC (NOT ALIPHATIC)



Tetrahydrofuran
(Heterocyclic ether)

OPEN-CHAIN ALIPHATIC

VS



Dimethyl ether
(Open-chain ether)



Key idea:
Cyclic structure + heteroatom
→ **Not aliphatic**





20. Pick out the option that is not a functional group from the following.

- A. Hydroxyl group
- B. Benzene group
- C. Aldehyde group
- D. Carboxylic acid group





20.

Pick out the option that is not a functional group from the following.

A. Hydroxyl group

B. Benzene group

C. Aldehyde group

D. Carboxylic acid group



Benzene Ring

Not a functional group

- Hydroxyl, aldehyde & carboxylic acid are functional groups



- Benzene is an aromatic ring system



BENZENE

- So, benzene is not a functional group



FUNCTIONAL GROUP vs BENZENE RING

FUNCTIONAL GROUPS



- ✓ Specific atoms/groups that determine chemical behaviour
- ✓ Present in many different molecules
- ✓ Examples: OH, CHO, COOH, NH₂, C=O

BENZENE RING



- ✓ Aromatic ring system with delocalized π electrons
- ✓ Impacts stability and reactivity
- ✓ Example: Benzene (C₆H₆)

KEY TAKEAWAY

Functional groups define reactivity. Benzene is an aromatic ring system, not a functional group.



21.

Which primary classification separates organic compounds into aliphatic and aromatic groups?

- A. Based on physical state**
- B. Based on presence of heteroatoms**
- C. Based on carbon skeleton structure**
- D. Based on molecular weight**



Download Pharmacy India Mobile App from Playstore

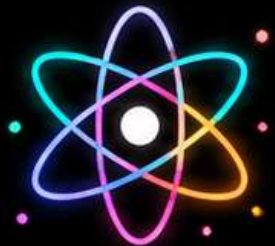


21.

Which primary classification separates organic compounds into aliphatic and aromatic groups?

- A. Based on physical state
- B. Based on presence of heteroatoms
- C. Based on carbon skeleton structure**
- D. Based on molecular weight





CARBON SKELETON CLASSIFICATION



MAIN IDEA

Organic compounds are classified by **carbon skeleton structure**.



★ KEY GROUPS

1 Aliphatic

Open-chain (acyclic)

2 Alicyclic

Non-aromatic ring

3 Aromatic

Aromatic ring

4 Heterocyclic

Ring with hetero atom

ALIPHATIC



e.g., Butane

ALICYCLIC



e.g., Cyclohexane

AROMATIC



e.g., Benzene

HETEROCYCLIC



e.g., Pyrrole



★ MEMORY LINE : **STRUCTURE DECIDES THE CLASS.** ★





22. Which classification groups compounds by repeating –
CH₂– units?

A. Functional group classification

B. Homologous series

C. Stereochemical classification

D. IUPAC rule system





22. Which classification groups compounds by repeating –
 CH_2 – units?

A. Functional group classification

B. Homologous series

C. Stereochemical classification

D. IUPAC rule system





HOMOLOGOUS SERIES



MAIN IDEA

: Members differ by **one $-\text{CH}_2-$** unit.



COMMON FEATURE

: Similar **chemical properties**.



TREND

: Physical properties **change gradually**.



MEMORY LINE

: **Same family, stepwise CH_2** change.

GENERAL FORMULA



(Alkanes)



DIFFER BY $-\text{CH}_2-$
SAME CHEMISTRY!



Methane



Ethane



Propane



SAME FUNCTIONAL GROUP

STRUCTURE CHANGES STEPWISE

CHEMISTRY SIMILAR

PHYSICAL PROPERTIES GRADUAL





23.

Which of the following is a heterocyclic compound?

A. n-Butane

B. Benzene

C. Pyridine

D. Ethene



Download Pharmacy India Mobile App from Playstore



23.

Which of the following is a heterocyclic compound?

A. n-Butane

B. Benzene

C. Pyridine

D. Ethene



Download Pharmacy India Mobile App from Playstore



HETEROCYCLIC COMPOUND: PYRIDINE



PYRIDINE



▶ HETEROCYCLIC COMPOUND

Pyridine is a **heterocyclic** compound.



▶ WHY?

Its ring contains a **heteroatom**.



▶ HETEROATOM PRESENT

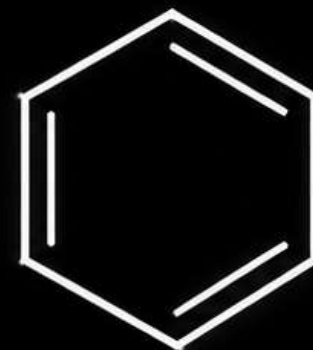
Nitrogen (N)



▶ COMPARE

Benzene has **only carbon** in the ring.

BENZENE (COMPARISON)



Only Carbon (C)
in the ring

★ Pyridine | Heterocyclic | Heteroatom: N (Nitrogen) | Benzene: Only Carbon





24.

Aldehydes and ketones are classified together due to which common functional feature?

- A. Presence of hydroxyl group**
- B. Presence of carbonyl group**
- C. Presence of nitrogen atom**
- D. Presence of double bonds to carbon**



Download Pharmacy India Mobile App from Playstore



24.

Aldehydes and ketones are classified together due to which common functional feature?

A. Presence of hydroxyl group

B. Presence of carbonyl group

C. Presence of nitrogen atom

D. Presence of double bonds to carbon



Download Pharmacy India Mobile App from Playstore



ALDEHYDES & KETONES



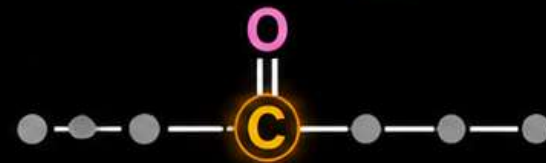
COMMON FEATURE: | Both contain the **carbonyl group** ($\text{C}=\text{O}$).



ALDEHYDE: | Carbonyl at **chain end**.



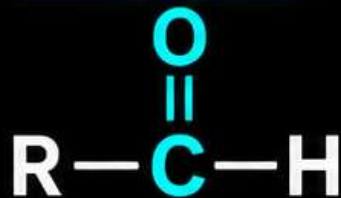
KETONE: | Carbonyl **within** the chain.



MEMORY LINE: | *Same carbonyl, different position.*



ALDEHYDE



→ End position

VS

KETONE



→ Internal position





25.

Which classification is based on degree of saturation?

- A. Aliphatic vs aromatic**
- B. Saturated vs unsaturated**
- C. Homoatomic vs heteroatomic**
- D. Primary vs secondary compounds**



Download Pharmacy India Mobile App from Playstore



25.

Which classification is based on degree of saturation?

A. Aliphatic vs aromatic

B. Saturated vs unsaturated

C. Homoatomic vs heteroatomic

D. Primary vs secondary compounds



Download Pharmacy India Mobile App from Playstore



SATURATED VS UNSATURATED

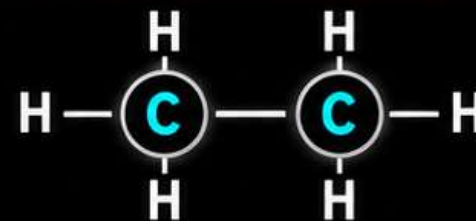


1



SATURATED

→ Only **SINGLE** bonds.



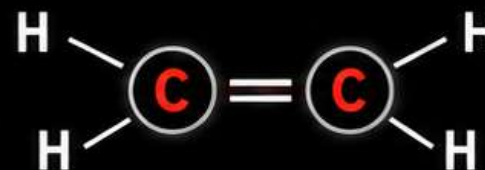
C-C
(single)

2



UNSATURATED

→ Contains **DOUBLE** or **TRIPLE** bonds.



C=C
(double)



C≡C
(triple)

3



EXAMPLES



ALKANES are **SATURATED**.
ALKENES / **ALKYNES** are **UNSATURATED**.



ALKANES



ALKENES



ALKYNES

4



MEMORY LINE



MORE π BONDS = UNSATURATION



SINGLE BOND = 0 π

DOUBLE BOND = 1 π

TRIPLE BOND = 2 π





26.

Which term describes compounds with the same molecular formula but different connectivity?

- A. Stereoisomers**
- B. Constitutional isomers**
- C. Tautomers**
- D. Enantiomers**





26.

Which term describes compounds with the same molecular formula but different connectivity?

A. Stereoisomers

B. Constitutional isomers

C. Tautomers

D. Enantiomers



Download Pharmacy India Mobile App from Playstore



CONSTITUTIONAL ISOMERS



MAIN IDEA : Same **molecular formula**, different **connectivity**.



ALSO CALLED : **Structural** isomers.



KEY POINT : Bonding **arrangement** changes.



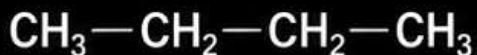
EXAMPLE CUE : **C₄H₁₀** can form **n-butane** and **isobutane**.



EXAMPLE



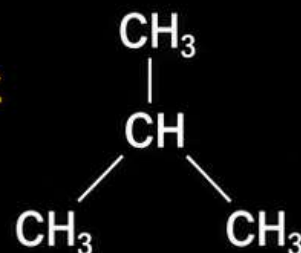
n-BUTANE



(Same
Molecular
Formula)



ISOBUTANE



Same Formula



Different
Connectivity



Different
Properties



27.

Which classification by reactivity groups compounds into nucleophiles and electrophiles?

- A. By physical properties**
- B. By reagent behavior**
- C. By IUPAC name**
- D. By polarity only**





27.

Which classification by reactivity groups compounds into nucleophiles and electrophiles?

A. By physical properties

B. By reagent behavior

C. By IUPAC name

D. By polarity only



Download Pharmacy India Mobile App from Playstore

NUCLEOPHILES & ELECTROPHILES



CLASSIFICATION BY **REACTIVITY** OR **REAGENT BEHAVIOR**



▶ NUCLEOPHILE (Nu^-)

Electron-rich; **attacks positive** center.



▶ ELECTROPHILE (E^+)

Electron-poor; **seeks** electrons.



▶ REACTIVITY BASIS

Opposite electronic nature **drives** reaction.



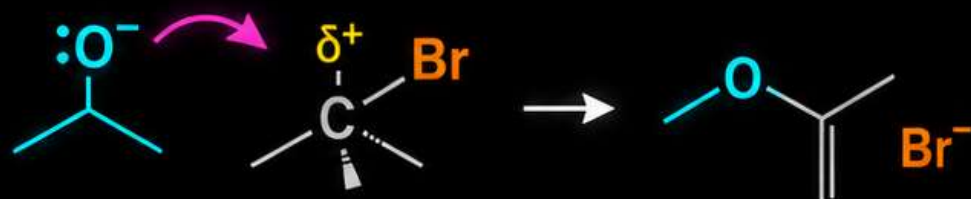
▶ MEMORY LINE

Nucleo gives; **electro** accepts.

CURVED-ARROW VISUAL



TINY ORGANIC CUE



Electron
Density



Reactivity



Charge
Preference



Bond
Formation



Arrow
Pushing



Concept
Essential



28.

What type of isomerism involves different spatial arrangements around a double bond?

- A. Optical isomerism**
- B. Geometrical isomerism**
- C. Chain isomerism**
- D. Functional isomerism**





28.

What type of isomerism involves different spatial arrangements around a double bond?

A. Optical isomerism

B. Geometrical isomerism

C. Chain isomerism

D. Functional isomerism





GEOMETRICAL ISOMERISM



CAUSE

Restricted rotation
around a **double bond**.



RESULT

Different
spatial arrangement.



FORMS

cis and **trans**.

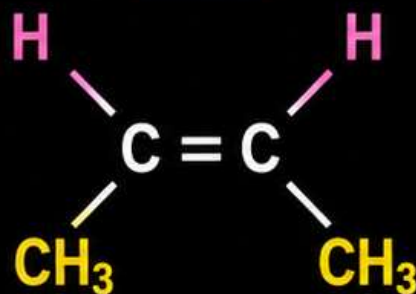


KEY POINT

Same connectivity,
different geometry.

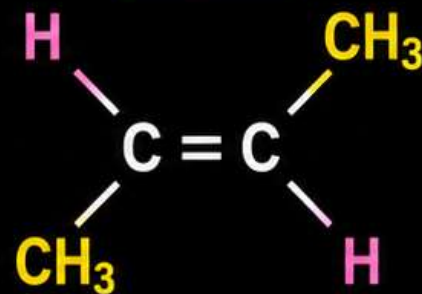
★ TWO GEOMETRICAL FORMS ★

cis



Similar groups
on **same side**

trans



Similar groups
on **opposite sides**



SAME CONNECTIVITY $\neq$ **DIFFERENT GEOMETRY** $\Rightarrow$ **DIFFERENT ISOMERS**





29.

Which class of organic compounds is generally acidic due to resonance-stabilized conjugate base?

A. Alcohols

B. Phenols

C. Alkanes

D. Amines





29.

Which class of organic compounds is generally acidic due to resonance-stabilized conjugate base?

A. Alcohols

B. Phenols

C. Alkanes

D. Amines



Download Pharmacy India Mobile App from Playstore



WHY PHENOLS ARE ACIDIC



► Phenols can release H^+ .



► Phenoxide ion is resonance stabilized.



► Resonance makes the conjugate base more stable.



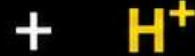
KEY POINT: More stable base
= greater acidity.



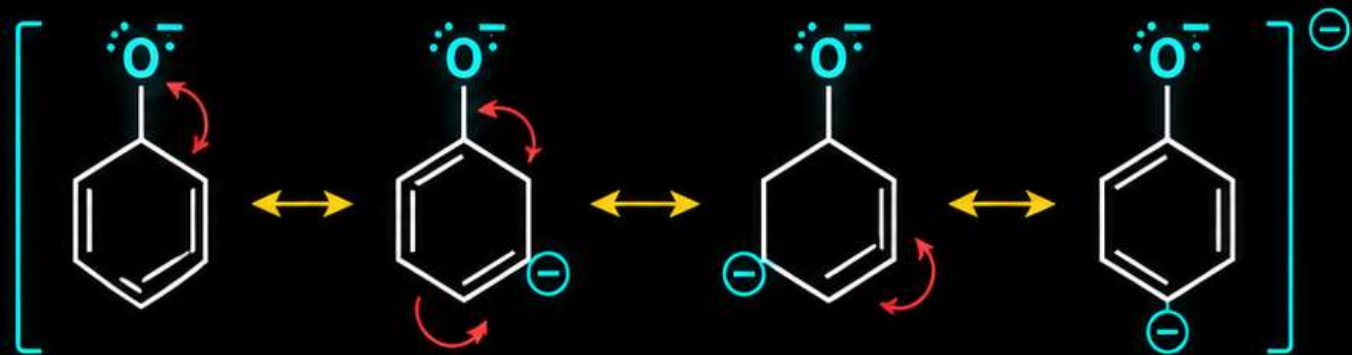
PHENOL



PHENOXIDE ION



RESONANCE STABILIZATION OF PHENOXIDE ION



Acidic H
is polar



Stability
drives acidity



Resonance
= Stability



Stronger acid
= Easier H^+ loss



More stability
= Greater acidity



30.

Which classification groups compounds by the presence of heteroatoms such as O, N, and S?

- A. Hydrocarbon classification**
- B. Heteroatom-containing compounds**
- C. Isomeric series**
- D. Polymeric series**





30.

Which classification groups compounds by the presence of heteroatoms such as O, N, and S?

A. Hydrocarbon classification

B. Heteroatom-containing compounds

C. Isomeric series

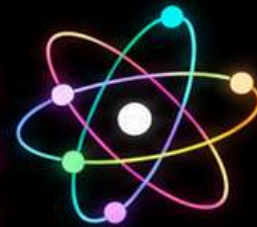
D. Polymeric series



Download Pharmacy India Mobile App from Playstore



HETEROATOM-CONTAINING COMPOUNDS



► **MAIN IDEA:** These compounds contain atoms **other than C and H**.



► **COMMON HETEROATOMS:** **O**, **N**, **S**



► **IMPORTANCE:** Heteroatoms **change properties** and **reactivity**.



► **EXAMPLES:** **Alcohols**, **amines**, **sulfides**.

COMMON HETEROATOMS



OXYGEN



NITROGEN



SULFUR



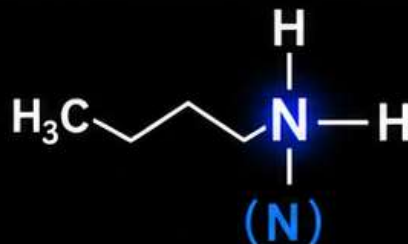
EXAMPLES



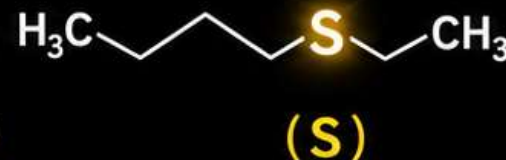
ALCOHOLS



AMINES



SULFIDES



HETEROATOMS = DIFFERENT ATOMS → DIFFERENT PROPERTIES → UNIQUE REACTIVITY





31.

Which compound is an example of an aromatic heterocycle used in drugs?

A. Methane

B. Pyrrole

C. 1-Butene

D. Cyclohexane



Download Pharmacy India Mobile App from Playstore



31.

Which compound is an example of an aromatic heterocycle used in drugs?

A. Methane

B. Pyrrole

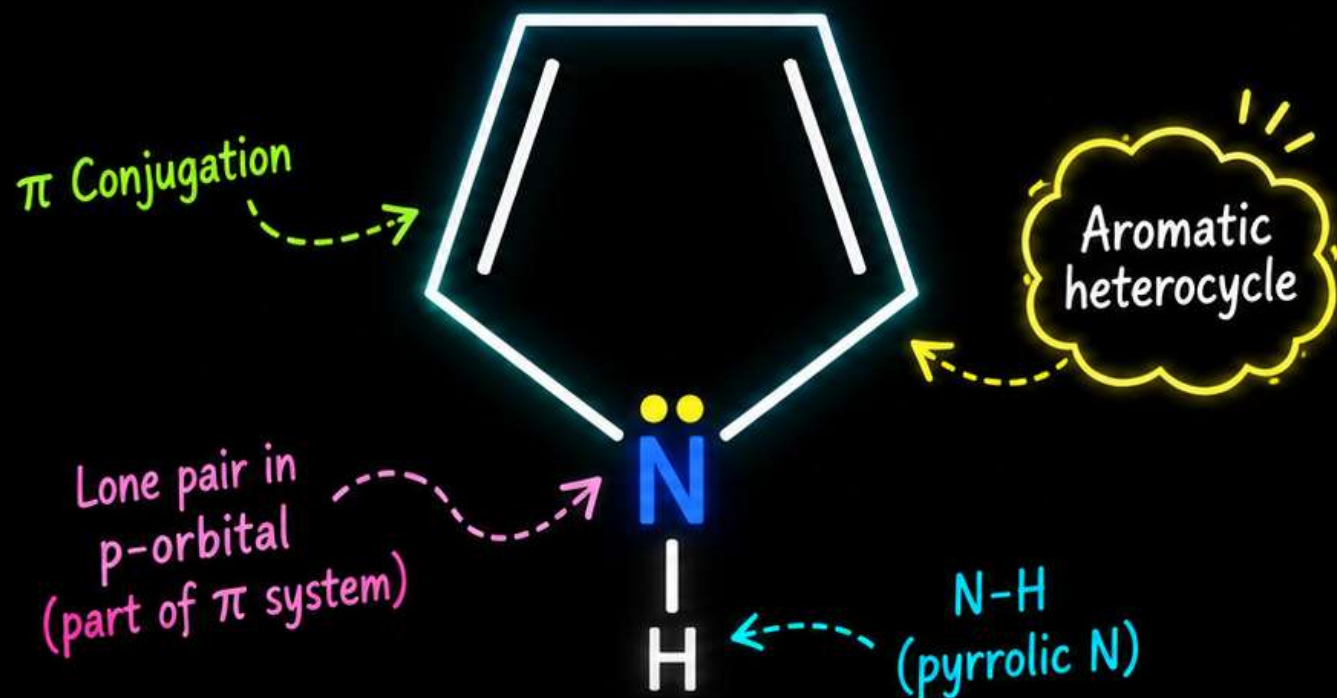
C. 1-Butene

D. Cyclohexane



Download Pharmacy India Mobile App from Playstore

PYRROLE = AROMATIC HETEROCYCLE



1 5-membered ring



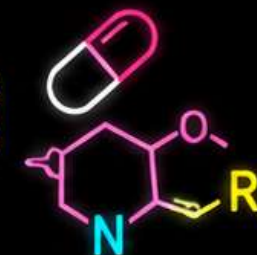
2 Contains one N atom



3 Planar conjugated system



4 Used in many drug-related heterocycles



★ **Hückel's Rule:** $(4n + 2) \pi$ electrons

Here: 4π (from C=C) + 2π (from N lone pair) = 6π ✓

💡 **Key Takeaway:**
Pyrrole is aromatic due to 6π electrons in a planar, conjugated ring.



32. Thiols are sulfur analogues of which functional group?

A. Alcohols

B. Aldehydes

C. Ketones

D. Carboxylic acids





32. Thiols are sulfur analogues of which functional group?

A. Alcohols

B. Aldehydes

C. Ketones

D. Carboxylic acids



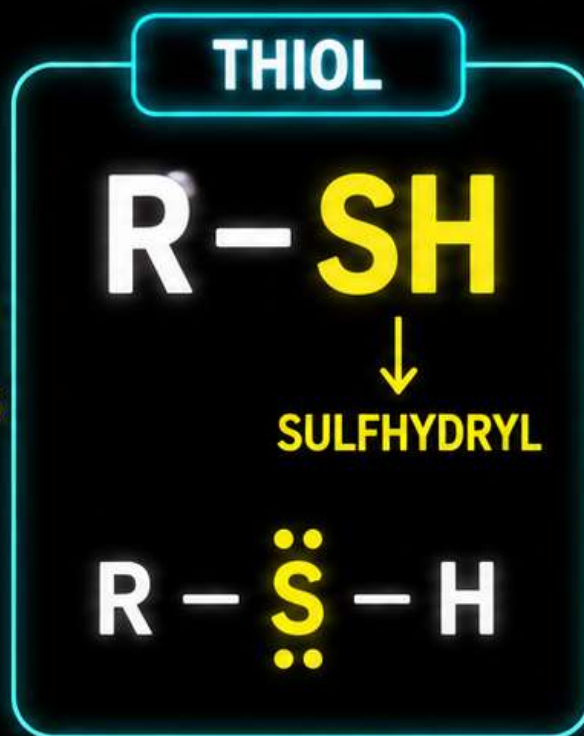
Download Pharmacy India Mobile App from Playstore

THIOLS = SULFUR ANALOGUES OF ALCOHOLS



OXYGEN
(MORE ELECTRONEGATIVE)

↔
ANALOGUES



SULFUR
(LESS ELECTRONEGATIVE)

- 1  Alcohol has **-OH**
- 2  Thiol has **-SH**
- 3  →  **Oxygen** replaced by **sulfur**
- 4  **Similar** functional behavior pattern



★ **THINK:** **alcohol** → **O** , **thiol** → **S**





33. Which classification indicates primary, secondary, and tertiary carbon centers?

- A. Hybridization classification
- B. Degree of substitution
- C. Polarity classification
- D. Functional group classification





33. Which classification indicates primary, secondary, and tertiary carbon centers?

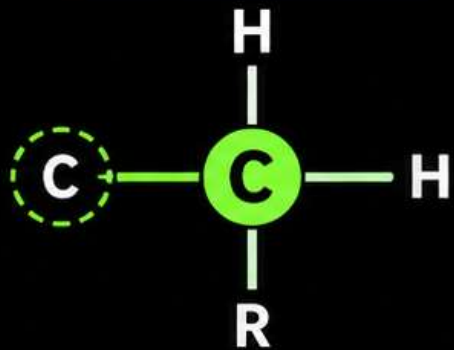
- A. Hybridization classification
- B. Degree of substitution**
- C. Polarity classification
- D. Functional group classification



DEGREE OF SUBSTITUTION OF CARBON

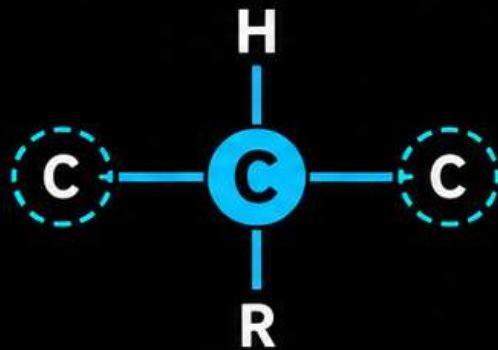


1° CARBON



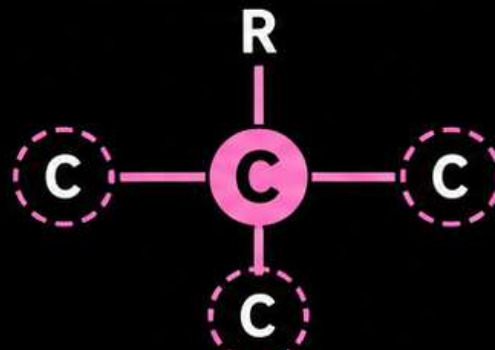
1 carbon attached

2° CARBON



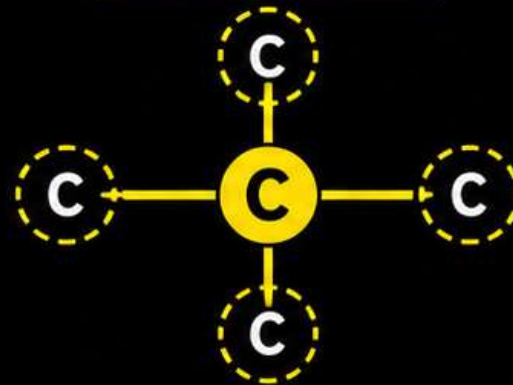
2 carbons attached

3° CARBON



3 carbons attached

4° CARBON



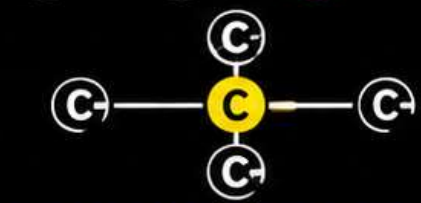
4 carbons attached

1° 1° carbon = attached to 1 carbon

2° 2° carbon = attached to 2 carbons

3° 3° carbon = attached to 3 carbons

4° 4° carbon = attached to 4 carbons



NOTE: Classification depends on neighboring carbon atoms





34. Ethers are classified by which functional feature?

- A. R–O–R linkage**
- B. R–NH–R linkage**
- C. R–CO–R linkage**
- D. R–SH linkage**





34. Ethers are classified by which functional feature?

A. R–O–R linkage

B. R–NH–R linkage

C. R–CO–R linkage

D. R–SH linkage



Download Pharmacy India Mobile App from Playstore

ETHERS CONTAIN **R-O-R** LINKAGE



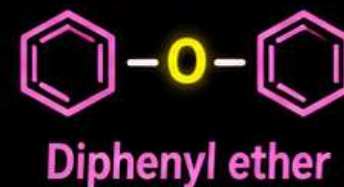
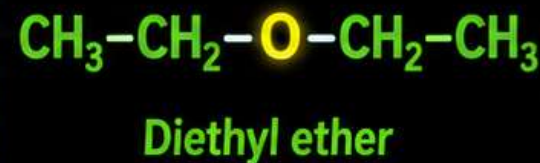
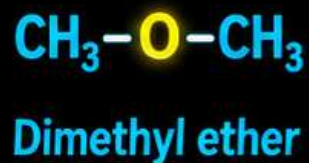
- 1  Oxygen bridges two groups
- 2  or  Groups may be **alkyl** or **aryl**
- 3  Characteristic **functional** feature of **ethers**
- 4  **Neutral** oxygen-containing compounds



MEMORY

Ether = **O** in between

EXAMPLES





35.

Which classification groups molecules by hybridization of the carbon atom?

- A. Geometrical classification**
- B. Electronic or hybridization classification**
- C. Polymer classification**
- D. Stereochemical classification only**





35.

Which classification groups molecules by hybridization of the carbon atom?

A. Geometrical classification

B. Electronic or hybridization classification

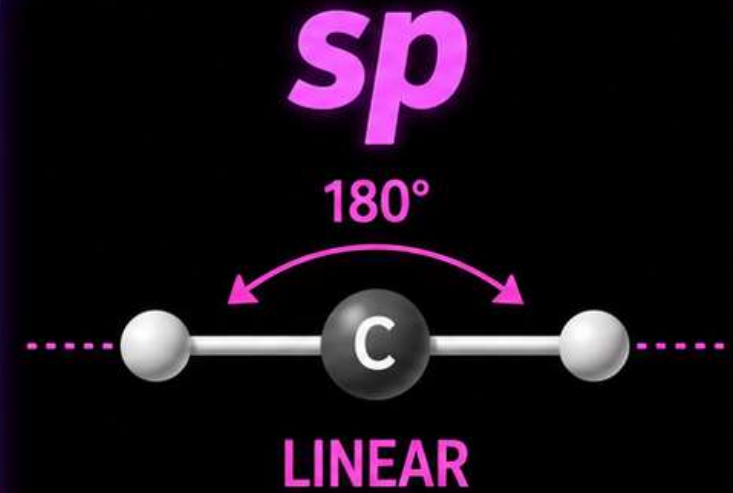
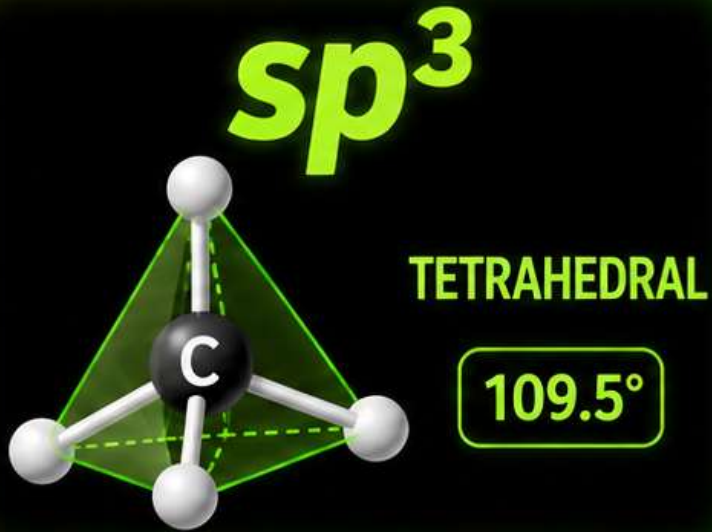
C. Polymer classification

D. Stereochemical classification only



Download Pharmacy India Mobile App from Playstore

CARBON HYBRIDIZATION CLASSIFICATION



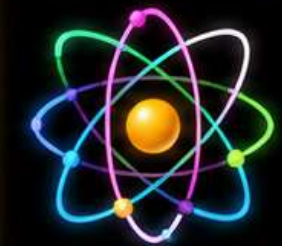
$C-C$ **sp^3** = single bonds, **tetrahedral**

$C=C$ **sp^2** = double bond tendency, **trigonal planar**

$C\equiv C$ **sp** = triple bond tendency, **linear**

 **Hybridization** depends on **bonding**

★ **NOTE**



Electronic / hybridization classification



36.

Which compounds are most likely to exhibit aromaticity according to Hückel's rule?

- A. Compounds with $4n \pi$ electrons**
- B. Compounds with $4n + 2 \pi$ electrons**
- C. Any conjugated system**
- D. Only saturated rings**





36.

Which compounds are most likely to exhibit aromaticity according to Hückel's rule?

- A. Compounds with $4n \pi$ electrons
- B. Compounds with $4n + 2 \pi$ electrons**
- C. Any conjugated system
- D. Only saturated rings



HUCKEL'S RULE FOR AROMATICITY



$$4n + 2 \pi \text{ electrons}$$

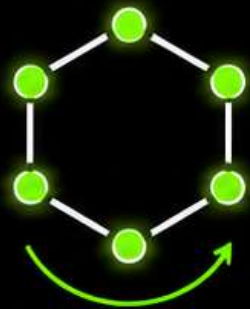
1 Aromatic systems follow $4n + 2 \pi$ rule

2 Ring must be **cyclic**

3 Ring should be **planar**

4 Continuous **conjugation** is required

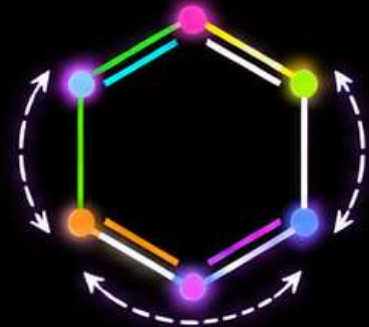
cyclic



planar



conjugated



Benzene = 6π electrons



$$\begin{aligned} n &= 1 \\ \Rightarrow 4(1) + 2 &= 6 \\ &\pi \text{ electrons} \end{aligned}$$



37.

Which functional group is present in esters?

A. --COOR

B. --OH

C. --NH_2

D. --SH





37.

Which functional group is present in esters?

A. --COOR

B. --OH

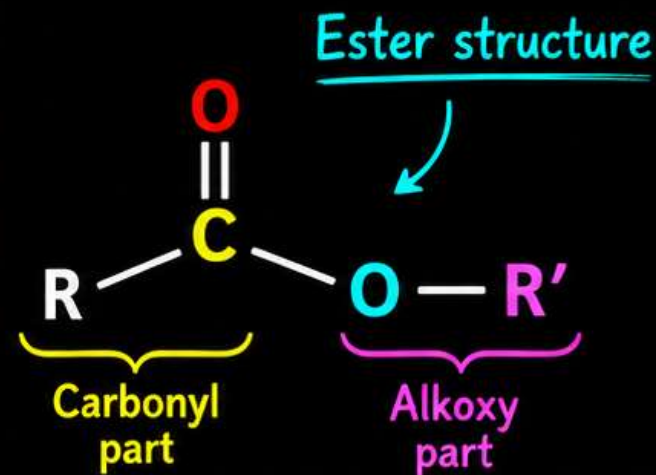
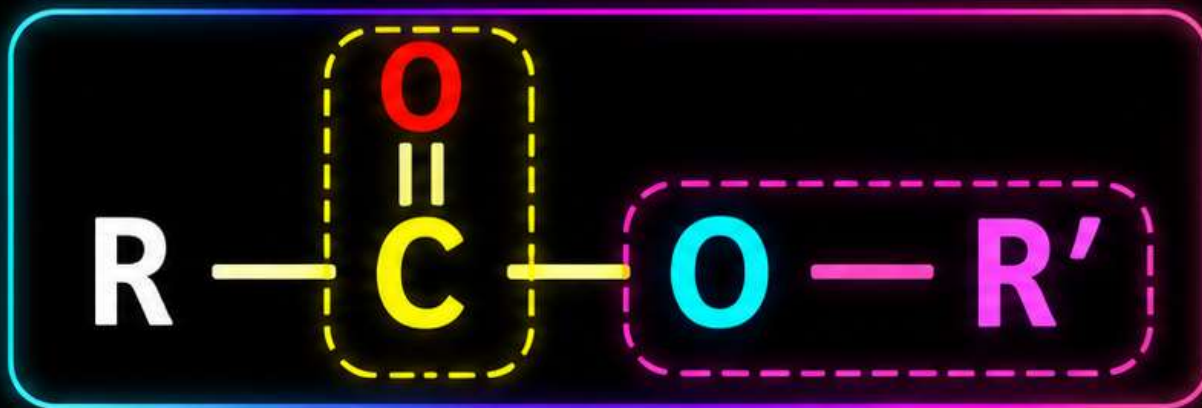
C. --NH_2

D. --SH



Download Pharmacy India Mobile App from Playstore

ESTERS HAVE THE -COOR GROUP



➤ Derived from **carboxylic acids**



➤ Contains **carbonyl** + **alkoxy** part

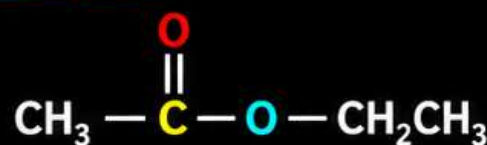


➤ Functional group = **-COOR**

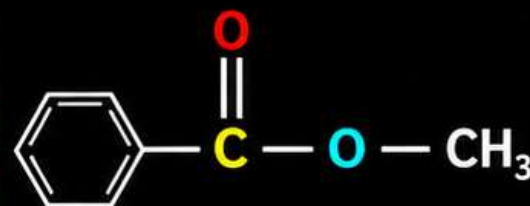


➤ Common in **organic** and **pharma** chemistry

Examples:



Ethyl acetate
(fruity aroma)



Methyl benzoate
(pleasant fragrance)



MEMORY NOTE: Ester = acid derivative





38.

Which classification describes molecules that are mirror images but non-superimposable?

A. Constitutional isomers

B. Enantiomers

C. Geometrical isomers

D. Tautomers



Download Pharmacy India Mobile App from Playstore



38.

Which classification describes molecules that are mirror images but non-superimposable?

A. Constitutional isomers

B. Enantiomers

C. Geometrical isomers

D. Tautomers



Download Pharmacy India Mobile App from Playstore

ENANTIOMERS = NON-SUPERIMPOSABLE MIRROR IMAGES



Same connectivity



Different 3D arrangement



Mirror images



Cannot be superimposed



Type of optical isomer



39.

Which class of compounds typically acts as bases in organic reactions?

A. Carboxylic acids

B. Amines

C. Alcohols

D. Aldehydes



Download Pharmacy India Mobile App from Playstore



39.

Which class of compounds typically acts as bases in organic reactions?

A. Carboxylic acids

B. Amines

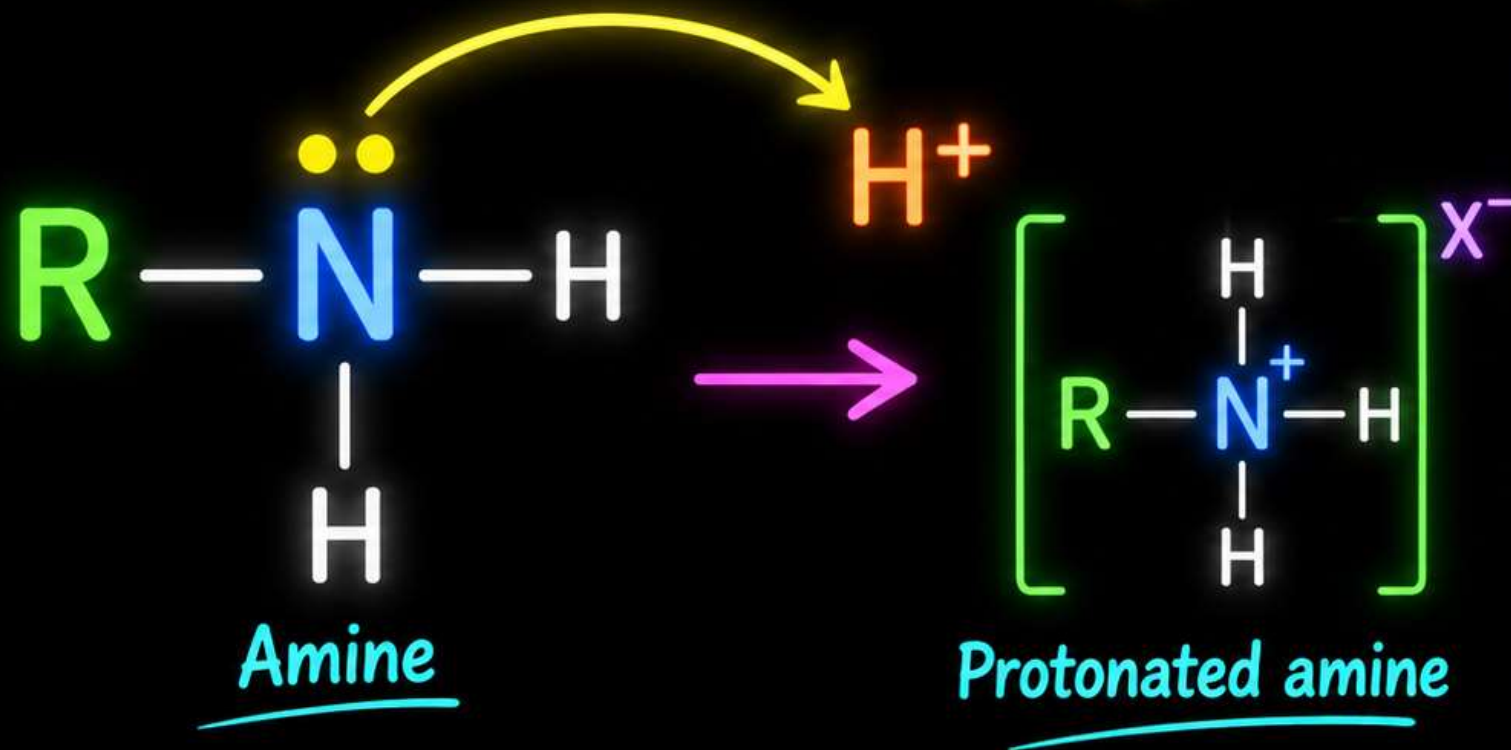
C. Alcohols

D. Aldehydes



Download Pharmacy India Mobile App from Playstore

AMINES ACT AS BASES



1. Nitrogen has a **lone pair**
2. Lone pair **accepts** proton
3. Therefore **amines** are **basic**
4. Important in **organic** reactions



MEMORY: Base = proton acceptor





40.

Which organic class contains the amide functional group important in peptides?

A. Ethers

B. Amides

C. Alkenes

D. Thiols



Download Pharmacy India Mobile App from Playstore



40.

Which organic class contains the amide functional group important in peptides?

A. Ethers

B. Amides

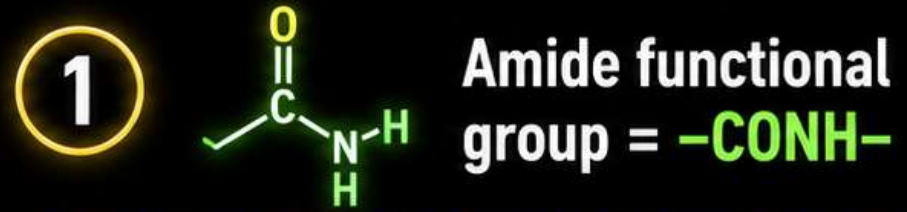
C. Alkenes

D. Thiols

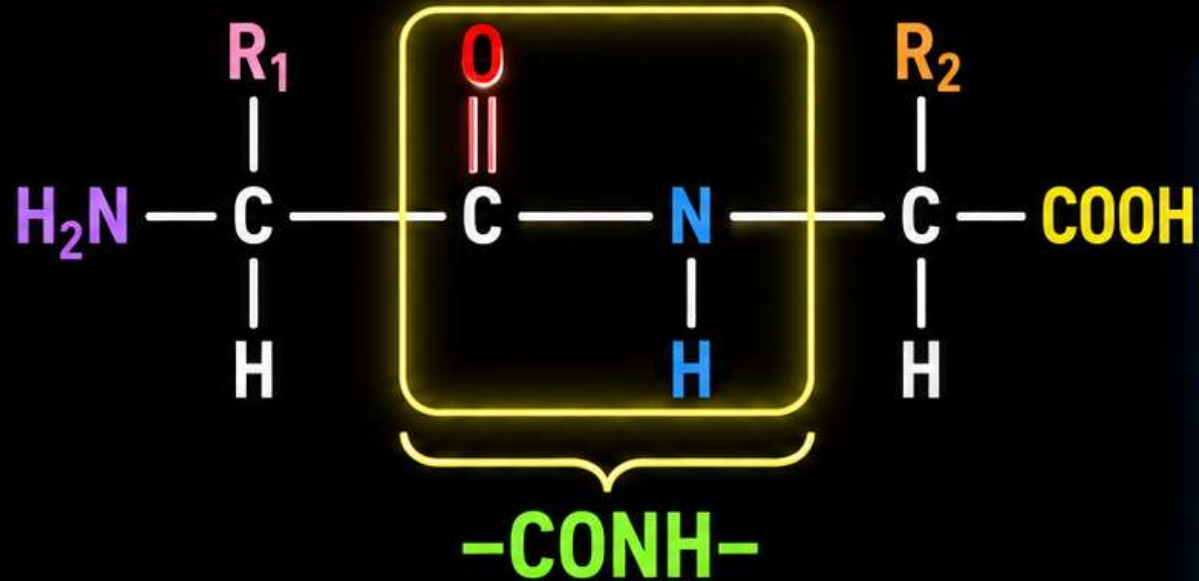


Download Pharmacy India Mobile App from Playstore

AMIDES CONTAIN THE **-CONH-** GROUP



AMIDE / PEPTIDE BOND



★ **Peptide bond = amide bond**



AMIDES (-CONH-) are the **backbone** of **proteins** and key in many **drugs**.



STABLE



STRONG



NATURAL



41.

Nitriles contain which functional group?

A. $-\text{C}\equiv\text{N}$

B. $-\text{NO}_2$

C. $-\text{NH}_2$

D. $-\text{COOH}$



Download Pharmacy India Mobile App from Playstore



41.

Nitriles contain which functional group?

A. $\text{—C}\equiv\text{N}$

B. —NO_2

C. —NH_2

D. —COOH



Download Pharmacy India Mobile App from Playstore



NITRILES



1



Functional group: $\text{—C}\equiv\text{N}$

2



Also called **cyano group**

3



Contains **carbon triple-bond nitrogen**

4

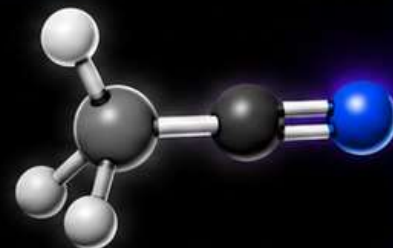
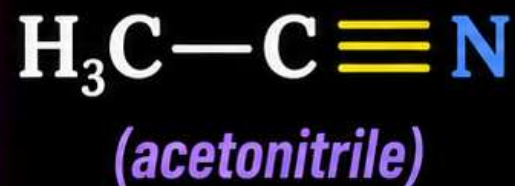


Example: $\text{CH}_3\text{—C}\equiv\text{N}$ (acetonitrile)

FUNCTIONAL GROUP



EXAMPLE





42.

Which classification is used for compounds that differ by placement of functional groups on the same carbon chain?

- A. Chain isomerism**
- B. Positional isomerism**
- C. Functional isomerism**
- D. Stereoisomerism**



Download Pharmacy India Mobile App from Playstore



42.

Which classification is used for compounds that differ by placement of functional groups on the same carbon chain?

A. Chain isomerism

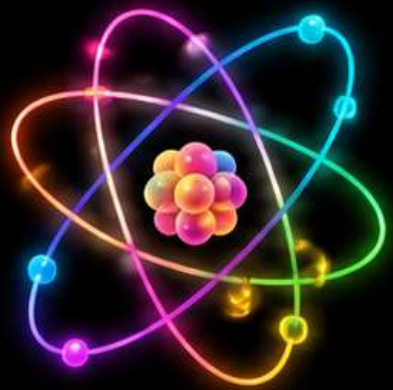
B. Positional isomerism

C. Functional isomerism

D. Stereoisomerism



Download Pharmacy India Mobile App from Playstore



POSITIONAL ISOMERISM



SAME CARBON SKELETON



SAME FUNCTIONAL GROUP



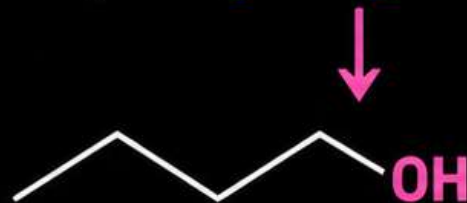
DIFFERENT POSITION OF THE FUNCTIONAL GROUP



EXAMPLE: 1-PROPANOL VS 2-PROPANOL

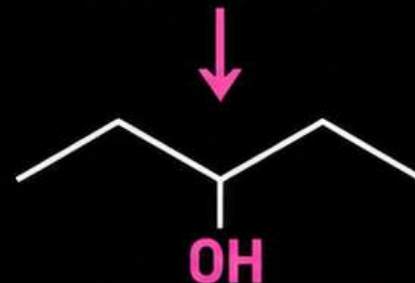
EXAMPLE

1-PROPANOL



OH at C-1

2-PROPANOL



OH at C-2

VS





43. Which group is characteristic of sulfonic acids often used in detergents?

A. $-\text{SO}_3\text{H}$

B. $-\text{COOH}$

C. $-\text{OH}$

D. $-\text{NH}_2$





43. Which group is characteristic of sulfonic acids often used in detergents?

A. $-\text{SO}_3\text{H}$

B. $-\text{COOH}$

C. $-\text{OH}$

D. $-\text{NH}_2$





SULFONIC ACIDS



1 CHARACTERISTIC GROUP: $-\text{SO}_3\text{H}$



2 SULFONIC ACID FUNCTIONAL GROUP

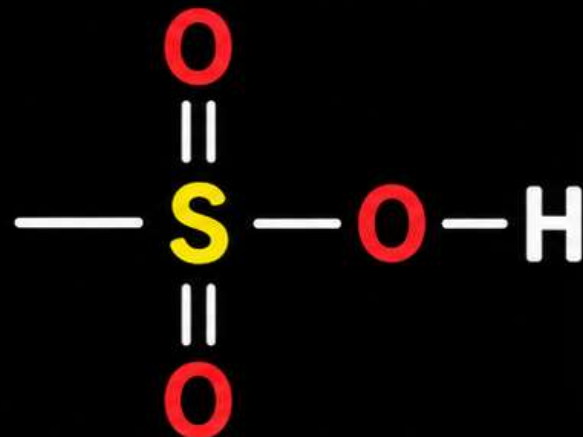


3 OFTEN FOUND IN DETERGENTS

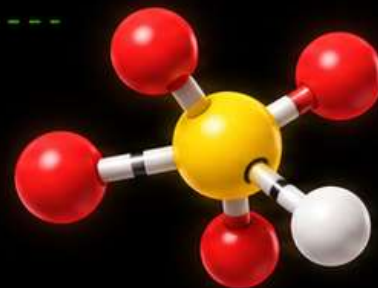
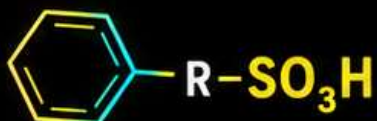


4 STRONGLY POLAR AND ACIDIC

$-\text{SO}_3\text{H}$ GROUP



FORMULA: $\text{R}-\text{SO}_3\text{H}$





44.

Which classification describes compounds with the same functional group but different carbon skeletons?

- A. Functional isomers**
- B. Chain isomers**
- C. Geometrical isomers**
- D. Optical isomers**



Download Pharmacy India Mobile App from Playstore



44.

Which classification describes compounds with the same functional group but different carbon skeletons?

A. Functional isomers

B. Chain isomers

C. Geometrical isomers

D. Optical isomers



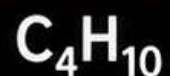
Download Pharmacy India Mobile App from Playstore



CHAIN ISOMERISM



▶ **SAME MOLECULAR FORMULA**



▶ **SAME FUNCTIONAL GROUP**

—
ALKANE



▶ **DIFFERENT CARBON SKELETON**

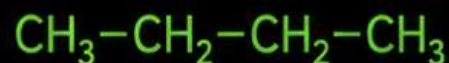


▶ **STRAIGHT CHAIN VS BRANCHED CHAIN**



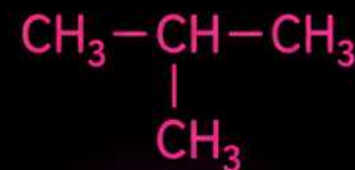
EXAMPLE

n-BUTANE
(STRAIGHT CHAIN)



VS

ISOBUTANE
(BRANCHED CHAIN)



STRUCTURAL
ISOMERISM



DIFFERENT
ARRANGEMENT



SAME
PROPERTIES



DIFFERENT
PHYSICAL PROPERTIES



BETTER
UNDERSTANDING



45.

Which heteroatom in heterocycles often imparts basicity to the ring?

A. Oxygen

B. Nitrogen

C. Sulfur

D. Phosphorus



Download Pharmacy India Mobile App from Playstore



45.

Which heteroatom in heterocycles often imparts basicity to the ring?

A. Oxygen

B. Nitrogen

C. Sulfur

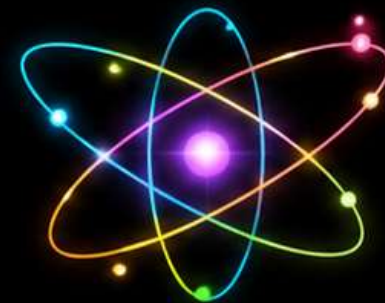
D. Phosphorus



Download Pharmacy India Mobile App from Playstore



BASICITY IN HETEROCYCLES



01

Key heteroatom: **NITROGEN**



02

Lone pair can **ACCEPT H^+**



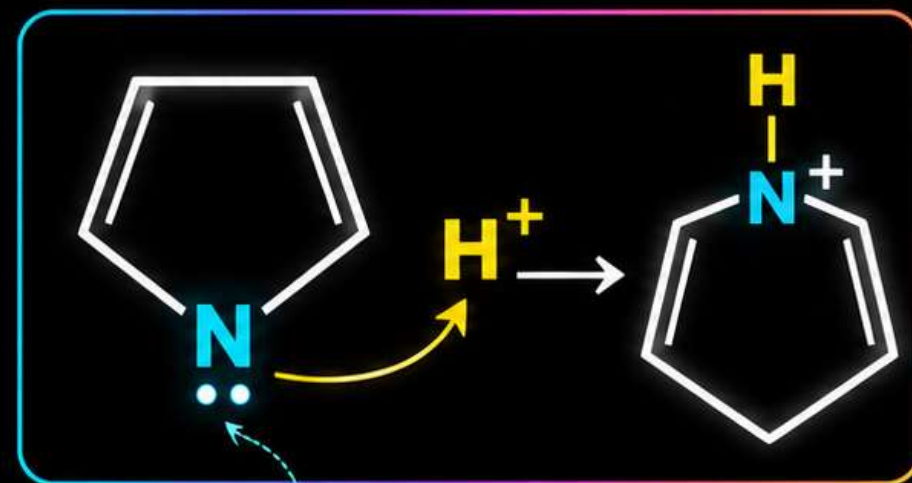
03

This imparts **BASIC CHARACTER**



04

Common in many **HETEROCYCLIC DRUGS**



LONE PAIR DONOR



Electron
Rich



Proton
Acceptor



Increases
Basicity



Affects
Reactivity



Key in Drug
Design



**More Basicity,
Better Protonation!**



46.

Which organic class reacts with nucleophiles at the carbonyl carbon most readily?

A. Ketones and aldehydes

B. Alkanes

C. Alkenes

D. Aromatic hydrocarbons



Download Pharmacy India Mobile App from Playstore



46.

Which organic class reacts with nucleophiles at the carbonyl carbon most readily?

A. Ketones and aldehydes

B. Alkanes

C. Alkenes

D. Aromatic hydrocarbons



Download Pharmacy India Mobile App from Playstore



ALDEHYDES & KETONES



1



MOST REACTIVE
TOWARD **NUCLEOPHILES**

2



REASON:
POLAR CARBONYL GROUP

3



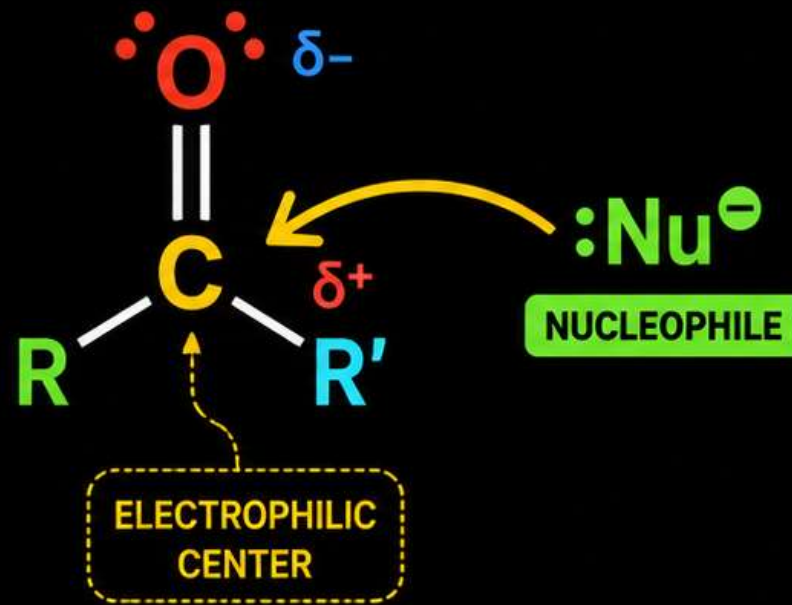
CARBONYL CARBON
IS **ELECTROPHILIC**

4



NUCLEOPHILE ATTACKS
THE **CARBONYL CARBON**

NUCLEOPHILIC ATTACK



HIGH
REACTIVITY



EASY
ADDITION



KEY TO MANY
REACTIONS



IMPORTANT IN
SYNTHESIS



**KEY
TAKEAWAY**



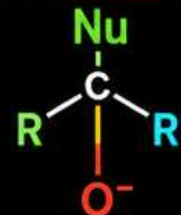
**POLAR
CARBONYL**



**ELECTROPHILIC
CARBON**



**NUCLEOPHILE
ATTACK**



**FORMATION OF
NEW BOND**



47.

Which class of compounds contains an –OH group directly bonded to an aromatic ring?

- A. Phenols**
- B. Alcohols**
- C. Aldehydes**
- D. Ketones**





47.

Which class of compounds contains an –OH group directly bonded to an aromatic ring?

A. Phenols

B. Alcohols

C. Aldehydes

D. Ketones



Download Pharmacy India Mobile App from Playstore



Key Concept

PHENOLS



Think
CHEMISTRY



FUNCTIONAL FEATURE:
-OH ON **AROMATIC RING**



HYDROXYL IS DIRECTLY
ATTACHED TO **BENZENE**



PHENOL IS DIFFERENT
FROM **ALIPHATIC ALCOHOLS**



IMPORTANT AROMATIC
HYDROXYL COMPOUND



-OH ON
AROMATIC RING



NOT ON
ALIPHATIC CHAIN

PHENOL
 C_6H_5OH

**USES &
IMPORTANCE**



ANTISEPTIC



PHARMACEUTICALS



RESINS &
PLASTICS



DISINFECTANTS



DYES &
PIGMENTS



48.

Which classification distinguishes enantiomers from diastereomers?

- A. Connectivity differences
- B. Relation of stereocenters
- C. Molecular formula only
- D. Presence of conjugation





48.

Which classification distinguishes enantiomers from diastereomers?

A. Connectivity differences

B. Relation of stereocenters

C. Molecular formula only

D. Presence of conjugation



Download Pharmacy India Mobile App from Playstore

ENANTIOMERS VS DIASTEREOMERS



1



BOTH ARE
STEREISOMERS

2



ENANTIOMERS:
MIRROR IMAGES

3



DIASTEREOMERS:
NOT MIRROR IMAGES

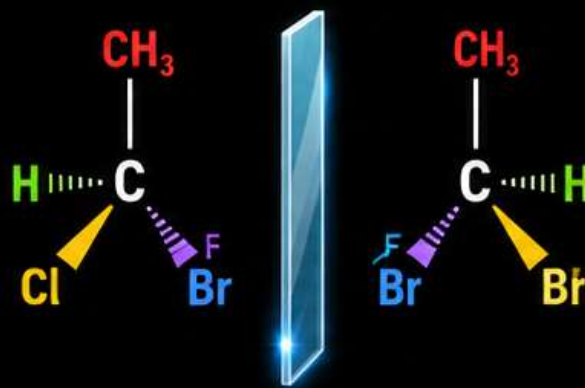
4



DIFFERENCE DEPENDS ON
RELATION OF **STEREOCENTERS**

ENANTIOMERS

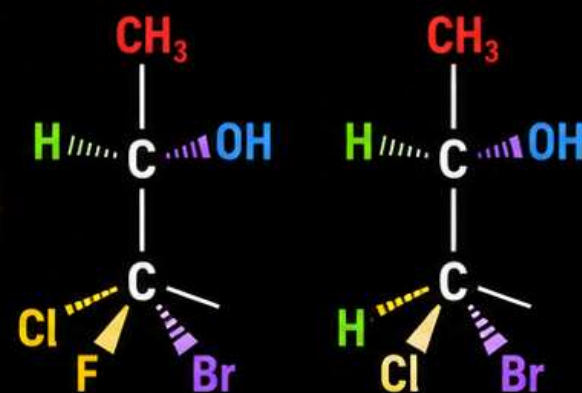
Mirror Images



NON-SUPERIMPOSABLE

DIASTEREOMERS

Not Mirror Images



NON-SUPERIMPOSABLE





49.

Which classification category would include steroids?

- A. Aliphatic hydrocarbons only**
- B. Polycyclic fused ring systems**
- C. Simple aromatics**
- D. Monomeric alcohols**



Download Pharmacy India Mobile App from Playstore



49.

Which classification category would include steroids?

A. Aliphatic hydrocarbons only

B. Polycyclic fused ring systems

C. Simple aromatics

D. Monomeric alcohols



Download Pharmacy India Mobile App from Playstore



STEROIDS



01

CLASSIFIED AS
POLYCYCLIC COMPOUNDS



02

CONTAIN **FUSED**
RING SYSTEM



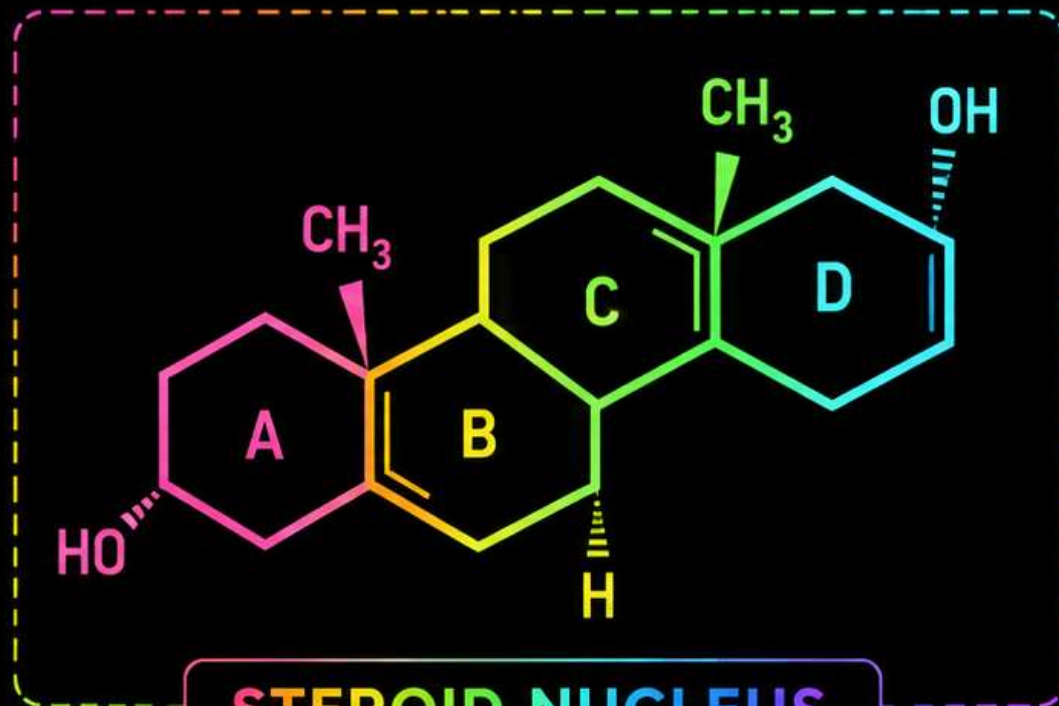
03

CHARACTERISTIC
STEROID NUCLEUS



04

MULTIPLE CYCLIC RINGS
JOINED TOGETHER



• 3 SIX-MEMBERED RINGS | • 1 FIVE-MEMBERED RING





50.

Which type of isomerism involves proton transfer, often seen in keto–enol pairs?

- A. Optical isomerism**
- B. Tautomerism**
- C. Geometrical isomerism**
- D. Chain isomerism**





50.

Which type of isomerism involves proton transfer, often seen in keto–enol pairs?

A. Optical isomerism

B. Tautomerism

C. Geometrical isomerism

D. Chain isomerism



Download Pharmacy India Mobile App from Playstore

TAUTOMERISM

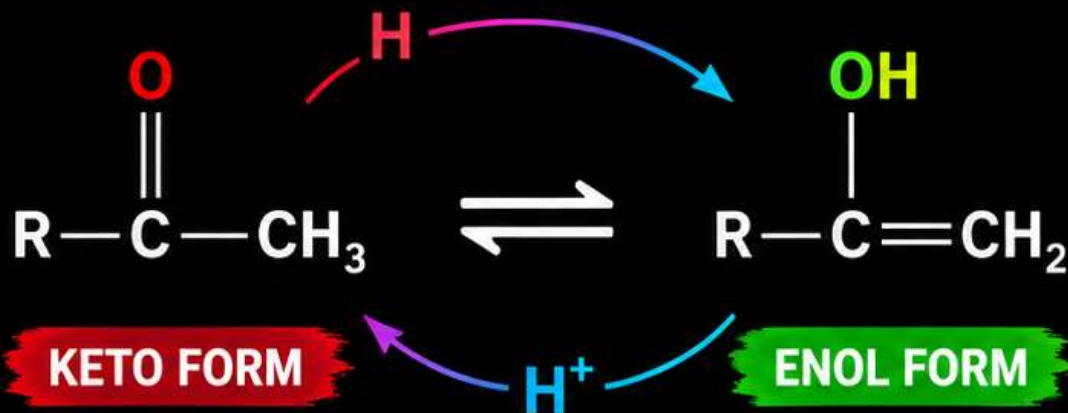
Dynamic **interconversion** of two forms

Often involves **proton transfer**

Classic example: **keto** $\rightleftharpoons$ **enol**

Type of **structural isomerism** in equilibrium

KETO $\rightleftharpoons$ **ENOL**



$\text{R} = \text{H, Alkyl, Aryl}$

SAME ATOMS. DIFFERENT ARRANGEMENT. DYNAMIC EQUILIBRIUM.



@PharmacyIndia



THANK
YOU!



Download Pharmacy India Mobile App from Playstore



GPAT PLUS

38 PREVIOUS YEAR QUESTION PAPERS
WITH DIGITAL EXPLANATION

←..... FEATURES→



Based on Latest
GPAT Syllabus



Subjectwise
Division



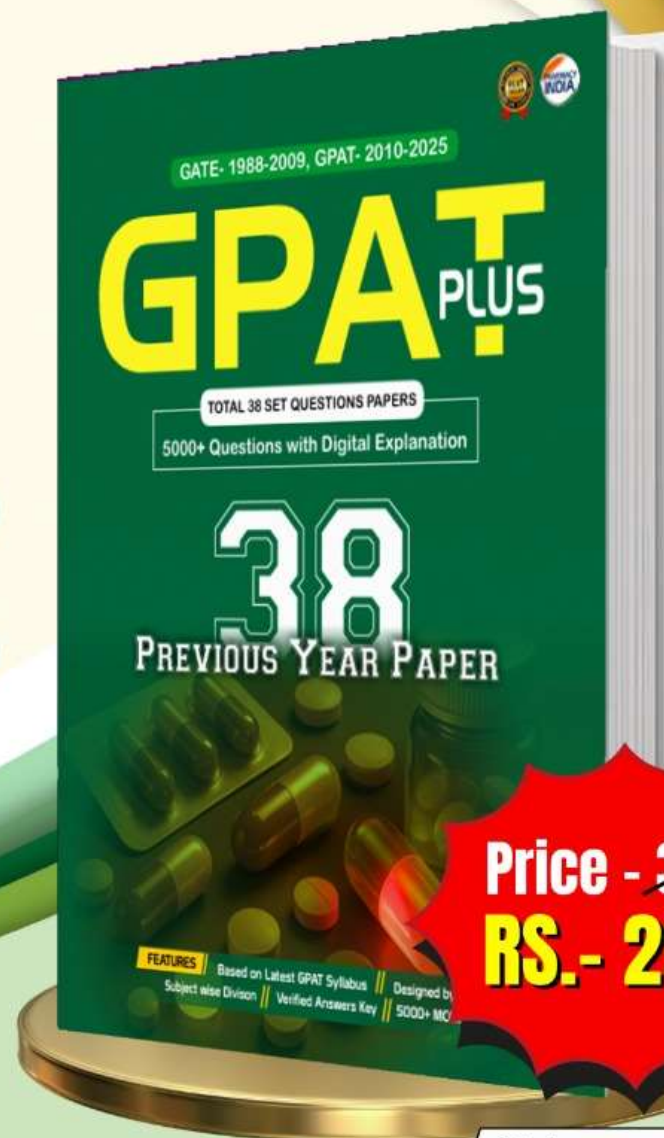
Verified
Questions



Designed
by Experts



Digital
Explanation



Price - ~~399~~
RS.- 299/-



DOWNLOAD PHARMACY INDIA APP FROM PLAYSTORE

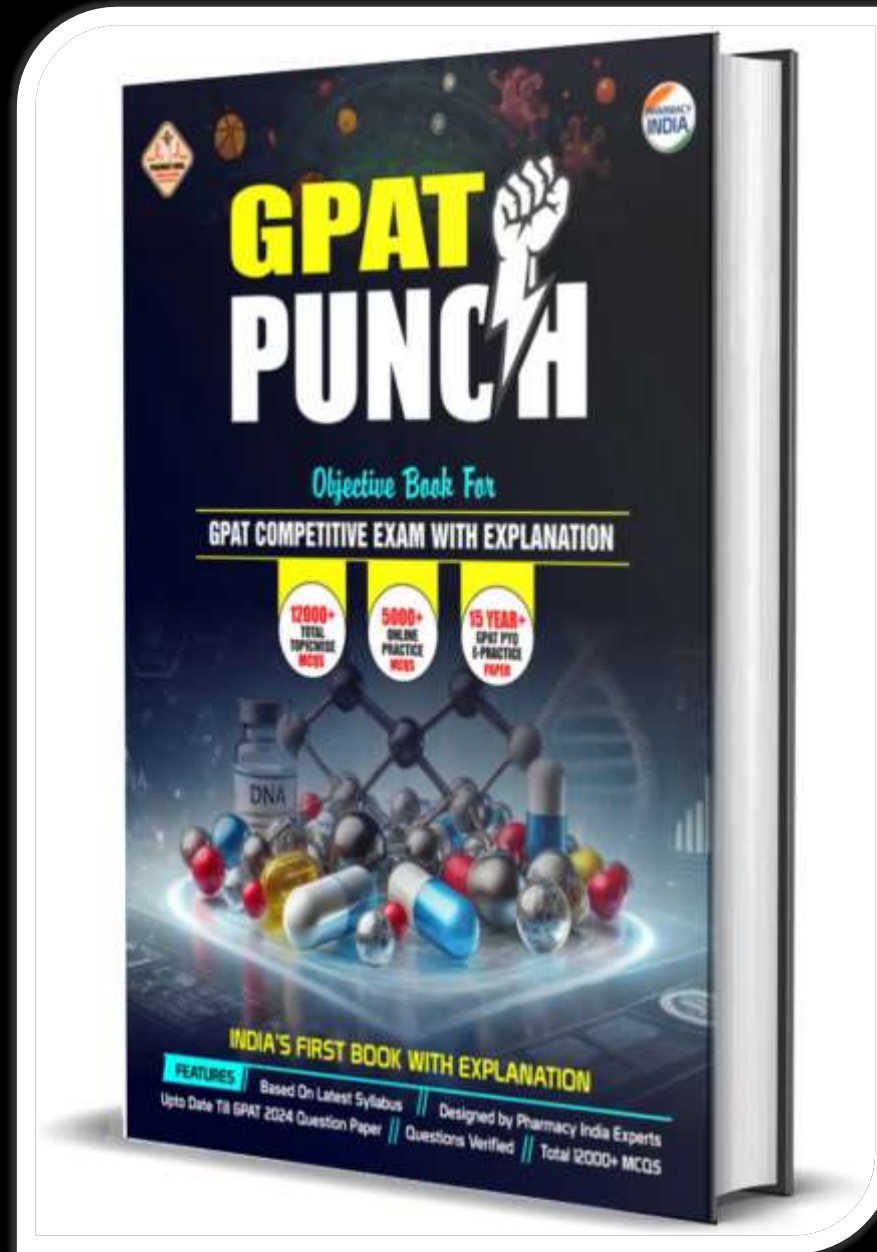


6395596959
8006781759

Best Book for GPAT Exam

AVAILABLE ON

Flipkart  amazon

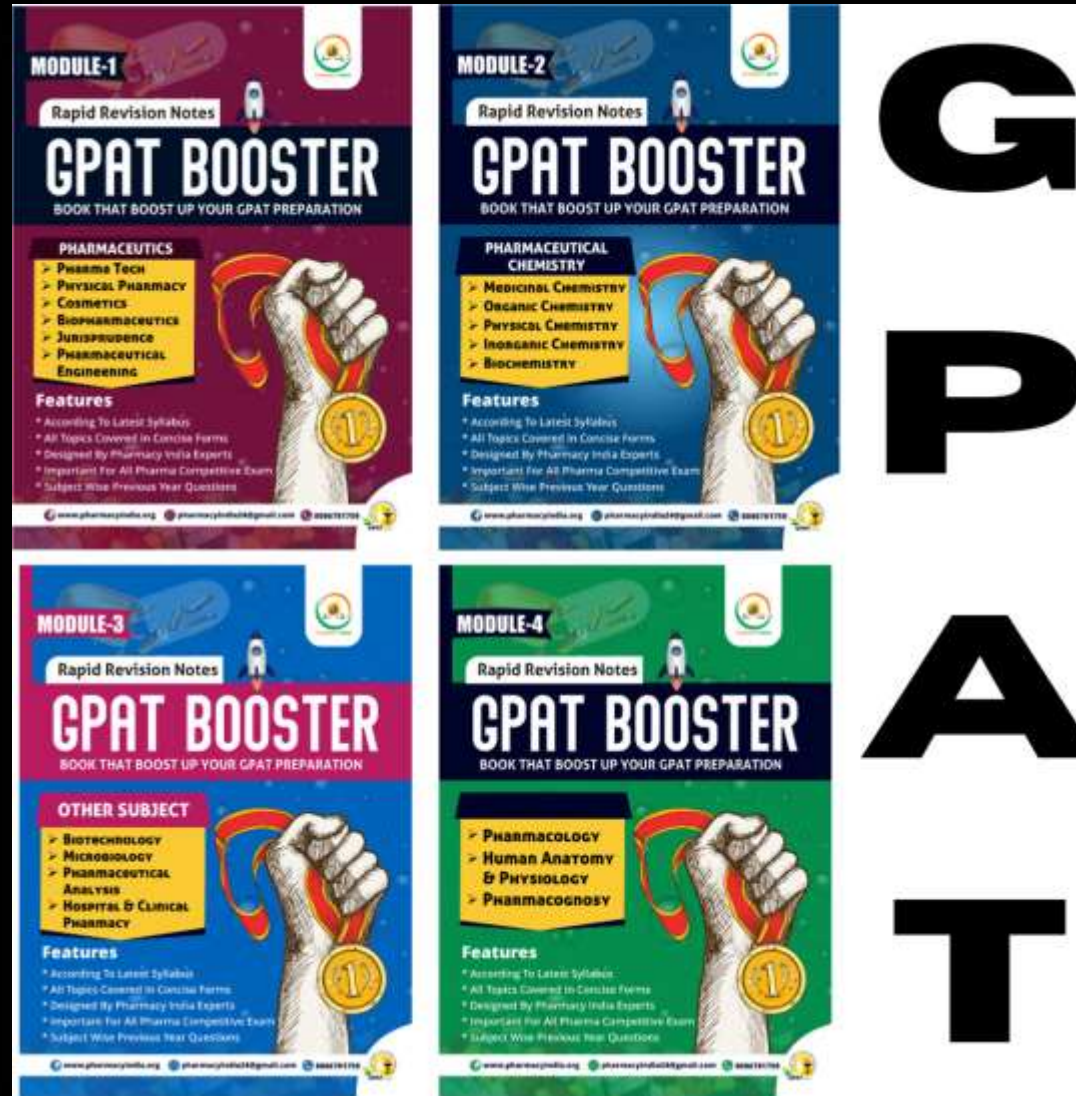


GPAT PUNCH OBJECTIVE BOOK

- Based on Latest Syllabus
- Upto Date Till GPAT 2026 Question Paper
- 5000+ Online Practice MCQs
- Total 12000+ MCQs
- 16 Year+ GPAT PYQ E-Practice Paper

Best Books for GPAT Exam

AVAILABLE ON



GPAT BOOSTER BOOKS

- According to Latest Syllabus
- All Topics Covered in Concise Forms
- Important for GPAT Exam
- Subject-wise Previous Year Questions included
- Includes short notes for rapid last-minute revision

DAILY UPDATES
जुड़िए PHARMACY INDIA
के साथ.....

WHATSAPP & TELEGRAM SE JUDNE KE LIYE
ICONS PAR CLICK KARE

