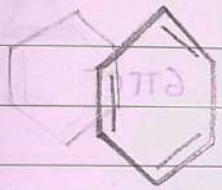
✳ Aromatic, Non-aromatic & Anti-aromatic :

⟹ Aromatic

I.) should be cyclic.
II.) complete conjugation should be there.
III.) should be planer.
IV.) it follows Huckel rule $(4n+2)\pi$ electrons.

$[n=0 \quad 2\pi e^-]$	$[n=2 \quad 10\pi e^-]$
$[n=1 \quad 6\pi e^-]$	$[n=3 \quad 14\pi e^-]$

eg:

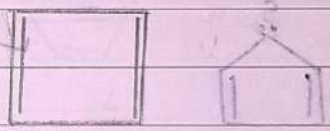


Anti-aromatic

I.) should be cyclic.
II.) complete conjugation should be there.
III.) should be planer.
IV.) $[4n]\pi$ electrons presence.

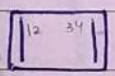
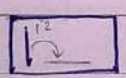
[if $n=1 \quad 4\pi e^-$]
$[n=2 \quad 8\pi e^-]$
$[n=3 \quad 12\pi e^-]$

eg:



- aromatic compounds are highly stable and less reactive whereas anti-aromatic compounds are highly unstable.
- Stability order:

Aromatic > Non-aromatic > Anti-aromatic

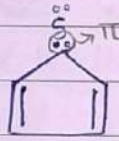
✳ Compound	cyclic	Planer	Comp. conj.	$(4n+2)\pi$	A/AA/NA
I.) 	✓	✓	✓	$2\pi e^-$	Aromat
II.) 	✓	✓	✓	$4\pi e^-$	Anti-A
III.) 	✓	X	X	$2\pi e^-$	Non-A
IV.) 	✓	✓	✓	$4\pi e^-$	Anti-A

★ Compound Cyclic Planer compition $(4n+2)\pi$ A/AA/NA

V.)  ✓ ✓ ✓ $6\pi e^-$ Aromat

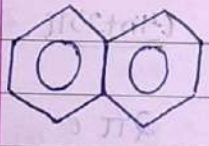
VI.)  ✓ X X $4\pi e^-$ Non-A

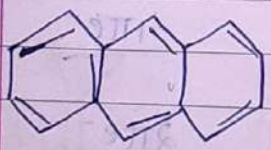
VII.) FURAN  ✓ ✓ $6\pi e^-$ Aromati

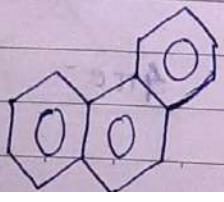
VIII.) THIOL  ✓ ✓ ✓ $6\pi e^-$ Aromatic

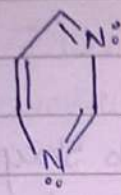
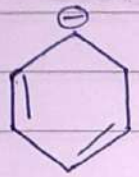
IX.) PYRROLE  ✓ ✓ ✓ $6\pi e^-$ Aromatic

X.) PYRIDINE  ✓ ✓ ✓ $6\pi e^-$ Aromatic

XI.) naphthalene  ✓ ✓ ✓ $10\pi e^-$ Aromatic

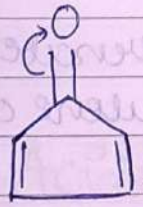
XII.) anthracene  ✓ ✓ ✓ $14\pi e^-$ Aromatic

XIII.)  ✓ ✓ ✓ $14\pi e^-$ Aromatic

★ Compound	Cyclic	Planer	Comp. Conj	$(4\pi+2)e^-$	A/AA/NA
XIV) 	✓	✓	✓	$6\pi e^-$	Aromatic
XV) 	✓	X	X	$6\pi e^-$	Non-A

XVI)  Aromatic.

XVII)  Aromatic

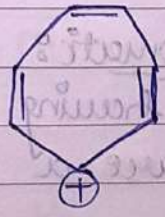
XVIII)  Anti-aromatic

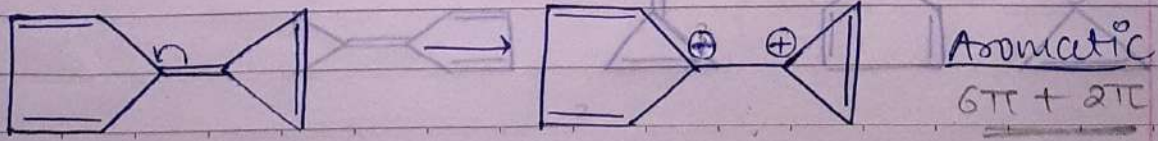
XIX)  (Non-planer) ∴ Non-aromatic

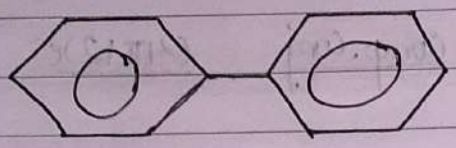
XX)  Aromatic

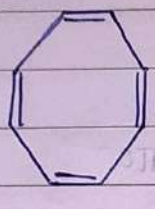
XXI)  Aromatic

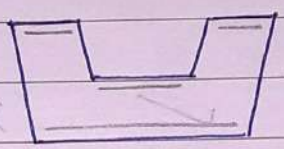
XXII)  Non-aromatic

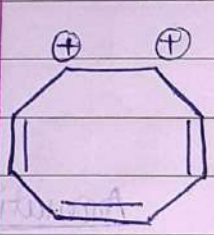
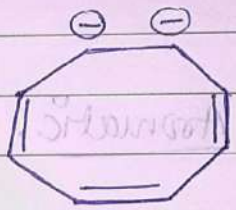
XXIII)  Aromatic

XXIV)  Aromatic
$6\pi + 2\pi$

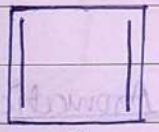
eg:  Diphenyl
Aromatic $(6\pi + 6\pi\ e^{-}s)$

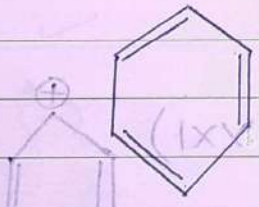
*  (Non planer)
Non Aromatic
Cyclo Octatetraene

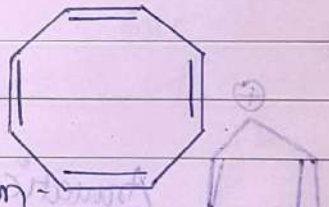
 (Tub shaped)
(Actual shape)

*  Aromatic or  Aromatic

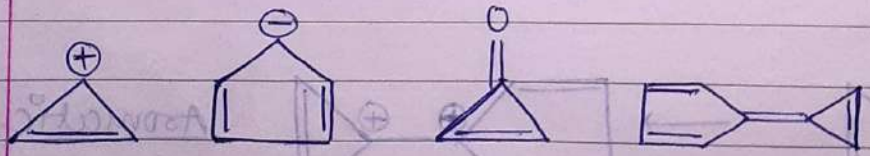
⟹ **Annulene:**
- molecule of monocyclic ring with alternate double bond or single bond. are Annulene org.comp


Anti-
Aromatic


Aromatic


Non-
Aromatic

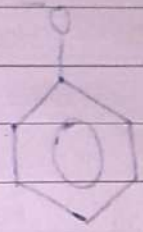
⟹ **Quasi-Aromatic:**
- compound having positive and negative charge in the molecule as a part of aromatic system.

eg: 

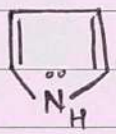
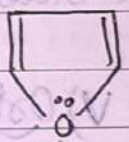
* Stability order in GOC:

Quasi aromatic > Aromatic > Resonance (R-eff). > Hyperconj. (H-eff) > I.eff >

Non aromatic > Anti aromatic <



Q.21 arrange them A/c to their aromaticity:

(A)  (B)  (C)  (D) 

→ (D) < (B) < (C) < (A)

* Acidic Strength:

- Factors affecting are:

1) I effect

→ Acidic Strength $\propto \frac{-I}{+I}$

II) M effect

→ Acidic strength $\propto \frac{+M}{-M}$

III) Value for Ka or Pka:

→ Acidic strength $\propto \frac{Ka}{pKa}$

IV) Stability of conjugated base

→ conjugated base is more stable then, comparitively acidic strength of molecule will be higher.

eg:  > $C_2H_5O^-$

(conj. base of ethanol).

(conj. base of phenol)
(R stabilised)

V) Ortho effect:

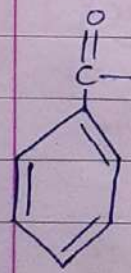
→ applicable only for benzoic acid and aniline.

↳ in benzoic acid if any other functional group is available at Ortho-position then, it will be more acidic in compare to benzoic acid.

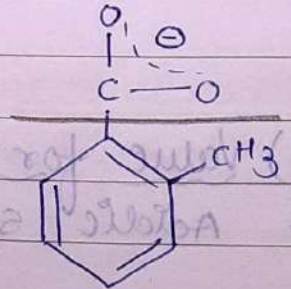
↳ the effect of ortho substituted group in benzoic acid is recognised as Ortho-effect.

→ this effect is carried out due to SIR.
(Steric inhibition resonance.)

→ at the conjugated base it'll be more effective.



(all πe^- in a plane)
(planer).



CH_3 attached at ortho.
∴, R limited to O-C-O only.
(no Reso. in benzene ring)