

class - U.G. semester - V

Subject - chemistry

Paper - MJC - IX (T)

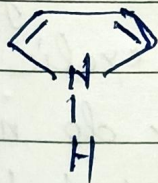
unit - 3

Topic - Heterocyclic compound

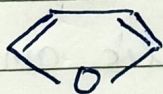
Introduction :-

Heterocyclic compounds are those cyclic compounds having at least one hetero atom (other than carbon) in the cyclic ring system. The most common hetero atoms are N, O, and S but other atoms like Boron, Phosphorous or silicon can also be members of heterocyclic rings.

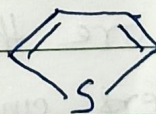
"Hetero" means different cyclic means forming a ring i.e. heterocyclic is a ring that contains atoms of different kinds not just carbon. e.g. :- five membered rings are



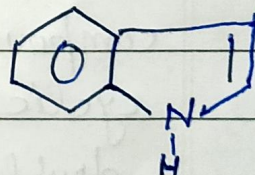
Pyrrole



Furan



Thiophene

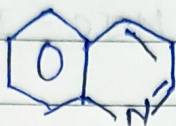


Indole

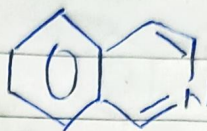
six membered rings are ! -



Pyridine



Quinoline



Isoquinoline

Heterocyclic compounds are frequently abundant in plants and animal products and they are one of the important constituents of almost one half of the natural organic compounds known.

classification ! -

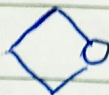
on the basis of structure and electronic arrangement the heterocyclic compounds may be classified into following two ~~categories~~ categories ! -

1. Aliphatic heterocyclic compound
2. Aromatic heterocyclic compound

The aliphatic heterocyclic compounds are the cyclic amines, cyclic amides, cyclic ethers and thioethers. They do not contain double bond are called saturated heterocyclics e.g ! -



ethylene oxide



oxetane



piperidine

Aromatic heterocyclic compounds are analogous of benzene and also follow the Huckel's rule.
e.g. Pyrrole, Furan, Thiophene etc.

A heterocyclic ring may consist of three or more than three atoms which may be saturated or unsaturated. Also heterocyclic ring may contain more than one hetero atom which may be either similar or different.

Based on the variety of structure the heterocyclic compounds may also be divided into following three categories :-

- a. Five membered heterocyclic compound
- b. Six membered heterocyclic compound and
- c. Fused or condensed heterocyclic compound