Theorem:— The Set of the type F_σ and G_δ are measurable sets.

Proof: Let E be a set of type F_σ Then E is expressible as

$$E = \sum_{K=1}^{\infty} F_K \qquad \text{where } F_K \text{ is a closed set.}$$

F_K is a closed set $\Rightarrow$ F_K is a measurable set

Also an enumerable union of measurable sets is measurable.

Hence $\bigcup_{K=1}^{\infty} F_K$ i.e E is measurable

(ii) Let E be a set of the type G_δ so that E Can be expressed as

$$E = \bigcap_{K=1}^{\infty} G_K$$

G_K is a open set $\Rightarrow$ G_K is a measurable set

Also an enumerable intersection of measurable sets is measurable.

Hence $\bigcap_{K=1}^{\infty} G_K$ i.e E is measurable

Definition: **Set of the Type F_σ:—** A Set E is said to be of the type F_σ if it is expressible as a union of an enumerable number of closed sets F_K i.e $E = \bigcup_{K=1}^{\infty} F_K$

Set of the Type G_δ:— A Set E is said to be of the type G_δ if it is expressible as an intersection of an enumerable number of open sets G_K i.e $E = \bigcap_{K=1}^{\infty} G_K$

Evidently Complement of F_σ is G_δ and Conversely

Borel Set:— A set E is called a Borel set if it Can be obtained from closed and open sets by using a finite or an enumerable number of union and intersection operations.

Example: The sets of type F_σ and G_δ are Borel sets.