Corollaray:- Let (X,d) be ametric space. Then A is open iff $A = \bigcup_{x\in A} N_r(x)$.

proof: $\Rightarrow$ suppose $A = \bigcup_{x\in A} N_r(x)$

T.P A is open.

Since $N_r(x)$ is an open set and Union of family open set is open, Then A is open.

$\Leftarrow$ Conversly A is open

T.P $A = \bigcup_{x\in A} N_r(x)$

Since A is open, Then $\forall x \in A \ \exists r>0 \ni N_r(x) \subseteq A$

$\Rightarrow \bigcup_{x\in A} N_r(x) \subseteq A$ --- ①

$\{x\} \subseteq N_r(x) \Rightarrow \bigcup_{x\in A}\{x\} \subseteq \bigcup_{x\in A} N_r(x)$

$A \subseteq \bigcup_{x\in A} N_r(A)$ --- ②

from ① and ② we get $A = \bigcup_{x\in A} N_r(x)$

Definitron:- let (X,d) be ametric space, $E \subseteq X$ apoi[nt] $P \in X$ is Called Limit point of E if every niegbourhood of P $(N_r(P) - \{P\}) \cap E \neq \phi$.

Example:- Let (R,d) be ausuall metric space
$A = (2,3]$

2 is limit point of A becouse every $N_r(2) - \{2\} \cap A \neq \phi$

0 is not Limit point of A becouse $\exists N_r(0) - \{0\} \cap A = \phi$