Definations of Probability :-

Suppose a RV has N outcomes which are mutually exlusive, exhaustive, E be an event with M favourable outcomes.

$$P(E) = \frac{M}{N}.$$

* Relative frequency.

for n trials, an times. Then E is.

$$P(E) = \lim_{n\to\infty} \left(\frac{a_n}{n}\right)$$

* (Imp)

Eg:- sequences of tosses in below order.

HHHT, HHHT, HHHT ....

$$\frac{a_n}{n} \rightarrow \frac{1}{1}, \frac{2}{2}, \frac{3}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7} \ldots \frac{9}{11}, \frac{9}{12} \ldots$$

$$\frac{a_n}{n} = \frac{3k}{4k} \quad \text{for } n = 4k.$$

$$= \frac{3k}{4k-1} \quad \text{for } n = 4k-1.$$

$$= \frac{3k-1}{4k-2} \quad \text{for } n = 4k-2$$

$$= \frac{3k-2}{4k-3} \quad \text{for } n = 4k-3.$$

→ Suppose S is sample space, $\mathcal{F} \in S$.

(i) if $E \in \mathcal{F}$ Then $E \in \mathcal{F}$

(ii) if $E_1, E_2, \ldots E_{n/\infty} \in \mathcal{F}$ Then

$$\bigcup_{i=1}^{n/\infty} E_i \in \mathcal{F}$$

⇒ Then

$P(E) \geq 0$, $P(S) = 1$, $P\left(\bigcup_{i=1}^{\infty} E_i\right) = \sum_{i=1}^{\infty} P(E_i)$.

$P(A \cup B) = P(A) + P(B)$, where A & B are independ

$P(\phi) = 0$, Consider $E_1 = \phi$ and $E_2 = S$.

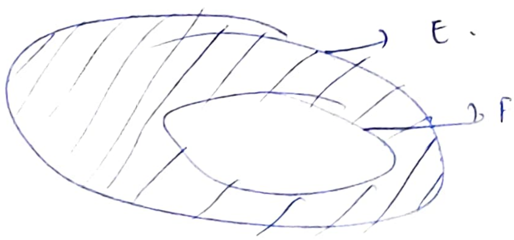
if $F \subset E$, Then

$$E = F \cup (E-F).$$

$P(E) = P(F) + P(E-F)$.

So, $P(E-F) = P(E) - P(F) \geq 0$

$$P(E) \geq P(F).$$



* $P(E^c) = 1 - P(E)$

as $E \cup E^c = S$.