Concepts and Definations to Remember

— Lecture 2.

* if we have n identical balls which are to be kept in k boxes such that no box will remain empty, then the number of possible arrangements is

$$^{n-1}C_{k-1}$$

* Two events E_1 and E_2 are said to be disjoint, if $E_1 \cap E_2 = \phi$

* A sequence of events $E_1, E_2 \ldots E_k$ is said to be mutually exclusive

if $E_i \cap E_j = \phi \quad \forall \; i, j \in \{1, 2, 3, \ldots k\}$.

* Two events A and B are said to be independent if $P(A \cap B) = P(A) \times P(B)$

- Probability is a mapping from the power set of Ω to $[0, 1]$.

i.e if $A \subseteq \Omega$ Then $P(A) = p$

where $0 \leq p \leq 1$

P satisfies the following.

→ $P(A) \geq 0 \quad \forall A \subseteq \Omega$.

→ $P(\Omega) = 1$.

→ if $A_1, A_2, A_3 \dots A_k$ are mutually exclusive

then $P(A_1 \cup A_2 \cup A_3 \dots A_k) = \sum_{i=1}^{k} P(A_i)$

* Given a set $A \subseteq \Omega$, $P(A)$ is computed as

$$\frac{\#\text{ of elements in } A.}{|\Omega|}$$

(When outcomes are equally likely)

* For any two Events A and B

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$