بسم الله الرحمن الرحيم

مفردات مادة الإحصاء والاحتمالية :

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Chapter one :- Introduction to probability

Chapter two :- Random variables and probability Distribution.

Chapter three :- Mathematical Expectation and Variance.

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Chapter Five :- Some special probability distributions.

Chapter Six :- Introduction to Stochastic process.

Chapter one :-

-: Introduction to probability :-

توضيح كلمة الاحتمالية والتجربة العشوائية وأنواعها على التجربة العشوائية.

— Some Important defenitions :-

1 Random experiment :-

— Is the experiment whose respected observation under a set of conditions does not always Lead to the Some outcomes.

2 Sample space :-

— The collection of every possible out come and it is denoted by S. (or Ω).

3 Event :-

— It is indicate an outcome or collection of out comes in any random experment and it is subset of the sample space.

— For example :- If an event C can happen in f ways out of a total N possible equally ways. Then the prob. of occurrence of the called its success and it is denoted by :-

$P(C) = \frac{f}{N}$. (or $P(C) = \frac{n(C)}{N}$)

— and the prob. of non-occurrence of the event called its failure such that :-

$$q = 1 - p(c) \implies p + q = 1$$

Examples- Two dice thrown once. Let A be the collection of every pair of the sample space for which the sum of the pair is equal to seven. Then A is :-

$S = \{(1,1), (1,2), (1,3), \ldots, (1,6), (2,1), \ldots, (3,6), \ldots (6,6)\}$

and

$A = \{(1,6), (2,5), (3,4), (4,3), (5,2), (6,1)\}$

then $p(A) = \frac{f}{N} = \frac{n(A)}{N} = \frac{6}{36}$

*** Types of events :-

① Simple event :- For exp. tail or head appearing when one coin is thrown.

② Mutually exclusive events :- If A, B are two mutually exclusive events then :-

$p(AB) = 0$ ⇒ For exp. A coin is thrown then a tail is appear that not head app.

③ Dependint and independent events :-

— If A, B two Indep. events, then A appearing not effect that B appearing. Then :-

$p(AB) = p(A) \cdot p(B)$.