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Mean of Random Variable

SUBJECT : (MATHEMATICS)
CHAPTER NUMBER: 13
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Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

Mean of random variable. .

Let x be a random variable that takes values $x_1, x_2, x_3, \ldots\ldots\ldots x_n$ with corresponding probabilities

$p_1, p_2, p_3, \ldots\ldots\ldots p_n$

Then

Mean = $\frac{\sum_{i=1}^{n} p_i x_i}{\sum p_i} = \sum_{i=1}^{n} p_i x_i$ Because $\sum p_i$=1

Note:-

(i) Mean of the Binominal Distribution = $\mu = np$

(ii) Mean of random variable otherwise known as expectation of X. it is denoted by

$\sum X = \sum p_i x_i$

Problem-1

Let a pair of dice be thrown and the random variable x be the sum of the numbers that appear on the two dice. Find the mean or expectation of x.

Problem-2

In a game, a man wins a rupee for a six and loses a rupee for any other number when a fair die is thrown. The man decided to throw a die thrice, but to quit as and when he gets a six. Find the expected value of the amount he wins/loses.

Problem-3

Two numbers are selected random (without replacement) from the first six positive integers.

Let X denotes the larger of two numbers obtained. Find the expectation of X.

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Q1. Find the probability distribution of the number of success in two tosses of a die, where the success is defined as 'getting a number greater than 4'. Also find the mean and variance of the distribution.

Q2. A die is tossed twice. A "success" is "getting an odd number" on a random toss. Find the variance of number of number of successes.

Q3. Two cards are drawn successively with replacement from well scuffled deck of 52 cards. Find the mean and standard deviation of number of aces.

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