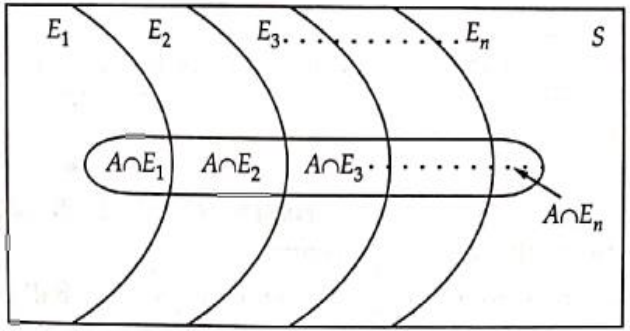
Partition of an event and Theorem of total probability

SUBJECT : (MATHEMATICS)
CHAPTER NUMBER: 13
CHAPTER NAME : PROBABILITY

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

Partition of an event and Theorem of total probability

Let S be the sample space and let E_1, E_2,…, E_n is n mutually exclusive and exhaustive events associated with a random experiment. If A is any event which occurs with E_1 or E_2 or------- En,



Then

$$P(A) = P(E_1) \times P\left(\frac{A}{E_1}\right) + P(E_2) \times P\left(\frac{A}{E_2}\right) + \ldots\ldots\ldots\ldots\ldots + P(E_n) \times P\left(\frac{A}{E_n}\right)$$

Example – 1

A bag contains 4 red and 3 black balls. A second bag contains 2 red and 4 black balls. One bag is selected at random. From the selected bag, on ball is drawn. Find the probability that the ball drawn is red.

Example – 2

Find the probability of drawing a one-rupee coin from a pure with two compartments one of which contains 3 fifty-paisa coins and 2 one-rupee coins and other contains 2 fifty paisa coins and 3 one rupee coins.

Example- 3

There are two bags, one of which contains 3 black and 4 white, balls, while the other contains 4 black and 3 white balls. A fair die is cast, if the face 1 or 3 turns up, a ball is taken from the first bag, and if any other face turns up a ball is chosen from the second bag. Find the probability of choosing a black ball.

Example - 4

Two third of the students in a class are boys and the rest are girls. It is known that the probability of a girl getting the first class is 0.25 and that a boy getting a first-class is 0.28. Find the probability that a student chosen at random will get the first-class mark in the subject.

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Q1. There are two bags. The first bag contains 5 white and 3 black balls and second bag contains 3 White and 5 Black balls. Two balls are drawn at random from the first bag and are put into the second bag without noticing their colors. Then Two balls are Drawn from the Second Bag. Find the probability that balls are white and black.

Q2. One bag contains 4 white and 5 black balls. Another bag contains 6 white and 7 black balls. A ball is transferred form the first bag to second bag and a ball is drawn from the second bag. Find the probability that the ball drawn is whit.

Q3. A bag contains 3 white and 2 black balls and another bag contains 2 white and some black balls. One bag is chosen at random. From the selected bag, one ball is drawn. If the probability of getting a black ball from the selected bag is $\frac{8}{15}$, Find the number of black balls in the second bag.

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THANKING YOU

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