

Exemplar Problem with Solution :

Q) A bag contains 8 red and 5 white balls. Two successive draws of 3 balls are made without replacement. The probability that the first draw will produce 3 white balls and the second 3 red ball is

Soln :

A bag contain 8 red and 5 white balls

$$\Rightarrow P(A \cap B) = P(A)P\left(\frac{B}{A}\right)$$

A is the event such that the first drawing will give 3 white balls.

B is the event such that the second drawing will give 3 blue balls.

$$\Rightarrow P(A) = \frac{\frac{5!}{3!2!}}{\frac{13!}{3!10!}} = \frac{5!10!}{2!3!} = \frac{5}{143}$$

$$\Rightarrow P\left(\frac{B}{A}\right) = \frac{\frac{8!}{3!5!}}{\frac{10!}{3!7!}} = \frac{8!7!}{5!10!} = \frac{7}{15}$$

$$\Rightarrow P(A \cap B) = P(A)P\left(\frac{B}{A}\right) = \frac{5}{143} \times \frac{7}{15} = \frac{7}{429} = 0.01632$$

Hence, the answer is $\frac{7}{429}$.