Assignment 4.5

A die marked A to E is rolled 50 times. Find the probability of getting a "D" exactly 5 times.

Sol

Probability of getting D is $P(D) = \frac{1}{5} = P$

$$\frac{\text{Chances of occurance}}{\text{Total num of chances}}$$

$1 - P = \frac{1}{1} - \frac{1}{5} = \frac{5-1}{5} = \frac{4}{5}$

Number (N) of times a die is rolled $(N) = 50$

Number of times getting D exactly $(x) = 5$.

By Binomial Distribution $\frac{N!}{(x!)(N-x)!} (P)^x (1-P)^{n-x}$

$$= \frac{50!}{(5!)(45!)} \left(\frac{1}{5}\right)^5 \left(\frac{4}{5}\right)^{50-5}$$

$$= 0.02953$$

∴ The probability of getting 'D' exactly 5 times is 0.02953