

⑪ The probability of a man hitting a target is $\frac{1}{10}$. The least number of shots required, so that the probability of hitting the target at least once is greater than $\frac{4}{5}$ is:

Soln:

$$\begin{aligned}\text{Probability of Hitting} &= P(H) = \frac{1}{10} \\ \text{Probability of Missing} &= P(M) = 1 - P(H) \\ &= 1 - \frac{1}{10} \\ &= \frac{9}{10}\end{aligned}$$

Probability of hitting atleast once $> \frac{4}{5}$.

i.e $1 - (\text{Probability of all shots resulting missing}) > \frac{4}{5}$

$$1 - [P(M)]^n > \frac{4}{5}$$

$$1 - \left(\frac{9}{10}\right)^n > \frac{4}{5}$$

$$\left(\frac{9}{10}\right)^n < \frac{3}{5}$$

$$\therefore \underline{n \geq 3}$$