Assignment

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Question 12.13.3.6 Explain why the experiment of tossing a coin three times is said to have binomial distribution

Solution: A random Variable X is said to have a binomial distribution with parameter n, p and q $(q = 1 - p)$

$$\Pr(X = r) = {}^{n}C_r p^r q^{n-r} \qquad r \in \{0, 1, 2 \ldots n\} \tag{1}$$

So, in an experiment of tossing a coin 3 times, we have $n = 3$ and random variable X can take values $r \in \{0, 1, 2, 3\}$ with $p = \frac{1}{2}$ and $q = \frac{1}{2}$

Random variable	values	Event
X	0	No heads
	1	1 head
	2	2 heads
	3	3 heads

TABLE 1: Random variable table

$\therefore$ it is said to have a binomial distribution.