Tutorial

B. Tech - CSBS

Binomial Distribution

Q.01 $n = 5$

$P(1) = 0.4096$ $\quad P(2) = 0.2048$.

${}^5C_1 pq^4 = 0.4096$ — (1) $\quad {}^5C_2 p^2q^3 = 0.2048$ — (2)

(1) ÷ (2) $\quad \dfrac{{}^5C_1 pq^4}{{}^5C_2 p^2q^3} = \dfrac{0.4096}{0.2048}$

$\Rightarrow \dfrac{5q}{10p} = 2$ — (3)

Also $p + q = 1$ — (4)

Solving (3) & (4) $p = 0.2$ or $\frac{1}{5}$

Q.2

Q.3 $n = 1000$, $SD = 6$.

$Var = SD^2 = 36$

$npq = 36$

$1000pq = 36$

$1000p(1-p) = 36$

$p - p^2 = 0.0036$

$p^2 - p + 0.0036 = 0$

$p = \text{img}$.

Invalid.

Q.4 $n = 400$, $p = 0.1$

Q.5 $n = 10$, $p = 20\% = \dfrac{20}{100} = 0.2$

Q.6 $n = 20$, $np = 2$

$20p = 2 \Rightarrow p = \dfrac{2}{20} = 0.1 \quad N = 1000$

Q.7 $n = 6$, $p = 1/5$

Q.8 $N = 256$, $n = 12$, $p = 1/2$, $P(8)$

Q.9 $n = 5$, $p = \frac{2}{3}$, $q = \frac{1}{3}$ (1)

(1) $P(x \geq 1) = P(1) + \cdots + P(5) = 1 - P(0)$

(2) $P(x \geq 3) = P(3) + P(4) + P(5)$.