

5 → ii The probability that called no. is busy is  $\frac{1}{15}$

$$P(\text{success} = x) = {}^nC_n \cdot p^n \cdot q^{(n-x)}$$

$$n = 0, 1, 2, \dots, n \leq q = (1 - p), n = 6$$

Probability that at least three of them will be busy is :-

$$P(0) + P(1) + P(2) + P(3)$$

$${}^6C_0 \left(\frac{1}{15}\right)^0 \left(\frac{14}{15}\right)^6 + {}^6C_1 \left(\frac{1}{15}\right)^1 \left(\frac{14}{15}\right)^5 + {}^6C_2 \left(\frac{1}{15}\right)^2 \left(\frac{14}{15}\right)^4 + {}^6C_3 \left(\frac{1}{15}\right)^3 \left(\frac{14}{15}\right)^3$$

$$\Rightarrow 1 - \left(\frac{14}{15}\right)^4 \left(\frac{59}{45}\right)$$