Answer on Question #38661 – Math - Statistics

Number of defective blades in a packet has binomial distribution $B(n, p)$ with parameters $n = 10$ and $p = 0.002$

Binomial distribution can be approximated using Poisson with parameter $m = np = 0.02$.

Let X equals to number of defective blades in a packet.

$$p_0 = P(X = 0) = e^{-0.02} = 0.9802$$

Using the formula

$$p_{x+1} = p_x \cdot \frac{m}{x+1}$$

we have:

$$p_1 = p_0 \cdot \frac{0.02}{1} = 0.019604$$

$$p_2 = p_1 \cdot \frac{0.02}{2} = 0.00019604$$

$$p_3 = p_2 \cdot \frac{0.02}{3} \approx 0$$

Thus expected frequencies are:

$$n_0 = 10000 \cdot p_0 \approx 9802$$

$$n_1 = 10000 \cdot p_1 \approx 196$$

$$n_2 = 10000 \cdot p_2 \approx 2$$

$$n_3 \approx 0$$