

AI1103-Assignment 1

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Python codes :

<https://github.com/Aayush-2492/Assignments/blob/main/Assignment%201/codes/Assignment1.py>

Latex codes :

<https://github.com/Aayush-2492/Assignments>

QUESTION

In a box containing 100 bulbs, 10 are defective. The probability that out of a sample of 5 bulbs, none is defective is?

SOLUTION

Let X denote the number of defective bulbs out of a sample of 5 bulbs. Probability of getting a defective bulb = $p = \frac{10}{100} = \frac{1}{10}$

$$q = 1 - p = \frac{9}{10}$$

Let X be the number of defective bulbs out of a sample of five bulbs

$$P(X = x) = \binom{5}{x} p^x q^{5-x}$$

$$P(X = 0) = \binom{5}{0} p^0 q^5$$

$$P(X = 0) = \left(\frac{9}{10}\right)^5$$

Therefore, Required probability

$$= \left(\frac{9}{10}\right)^5$$