A test consists of 70 multiple choice questions, each with five possible answers, only one of which is correct. Find the mean and the standard deviation of the number of correct answers.

Solution

The experiment follows a binomial experiment with $n = 70$, $p = \frac{1}{5}$, and $q = 1 - p = 1 - \frac{1}{5} = \frac{4}{5}$.

Therefore the mean of the number of correct answers is

$$\mu = np = 70 \cdot \frac{1}{5} = 14.$$

The standard deviation of the number of correct answers is

$$\sigma = \sqrt{npq} = \sqrt{70 \cdot \frac{1}{5} \cdot \frac{4}{5}} = \sqrt{\frac{56}{5}} = 3.35.$$