

Questions on Population Variance

Question 1. One-sample variance (Chi-square test)

A manufacturer claims that the variance in the diameter of its ball bearings is **0.01 cm²**. A random sample of **20 ball bearings** gives a sample variance of **0.018 cm²**. At the 5% significance level, test whether the population variance is greater than 0.01.

(Hint: Use Chi-square test for a single variance.)

Question 2.

A machine fills sugar packets that are supposed to have a variance of **4 grams²** in weight. A random sample of **25 packets** shows a sample variance of **6 grams²**. At the 5% significance level, test whether the population variance is significantly greater than 4.

(Hint: Use Chi-square test for one variance.)

Questions on Population Proportions

Question 3. One-sample proportion (Z-test for proportion)

A political candidate claims that **60% of voters** support her. In a survey of **100 voters**, **52** say they support her. At the 5% significance level, test whether the true proportion is different from 0.60.

(Hint: Use one-sample Z-test for proportion.)

Question 4.

A university claims that **30% of its students own a laptop**. A survey of **150 students** shows that **60 own a laptop**. At the 5% significance level, test whether the proportion of students owning a laptop is significantly different from 0.30.

(Hint: Use one-sample Z-test for a proportion.)