

STATISTICS WORKSHEET-8

Q1 to Q12 have only one correct answer. Choose the correct option to answer your question.

1. In hypothesis testing, type II error is represented by β and the power of the test is $1-\beta$ then β is:
b. The probability of failing to reject H_0 when H_1 is true
2. In hypothesis testing, the hypothesis which is tentatively assumed to be true is called the
b. null hypothesis
3. When the null hypothesis has been true, but the sample information has resulted in the rejection of the null, a _____ has been made
d. Type I error
4. For finding the p-value when the population standard deviation is unknown, if it is reasonable to assume that the population is normal, we use
b. the t distribution with $n - 1$ degrees of freedom
5. A Type II error is the error of
b. accepting H_0 when it is true
6. A hypothesis test in which rejection of the null hypothesis occurs for values of the point estimator in either tail of the sampling distribution is called
d. a two-tailed test
7. In hypothesis testing, the level of significance is
b. the probability of committing a Type I error
8. In hypothesis testing, β is
a. the probability of committing a Type II error
9. When testing the following hypotheses at an α level of significance
 $H_0: p = 0.7$
 $H_1: p > 0.7$
The null hypothesis will be rejected if the test statistic Z is
a. $Z > Z_{\alpha}$
10. Which of the following does not need to be known in order to compute the P-value?
a. knowledge of whether the test is one-tailed or two-tail
11. The maximum probability of a Type I error that the decision maker will tolerate is called the
a. level of significance

12. For t distribution, increasing the sample size, the effect will be on
a. Degrees of Freedom

Q13 to Q15 are subjective answers type questions. Answers them in their own words briefly.

13. What is Anova in SPSS?

Ans. ANOVA (Analysis of Variance) is a statistical method used to analyze the differences among group means in a dataset. In SPSS (Statistical Package for the Social Sciences), ANOVA can be performed using the Analyze menu. SPSS provides several options for performing ANOVA, including one-way ANOVA, factorial ANOVA, repeated measures ANOVA, and mixed ANOVA. The ANOVA output in SPSS includes F-ratio, degrees of freedom, p-value, and effect size measures such as eta-squared and partial eta-squared. ANOVA is commonly used in various fields such as social sciences, business, biology, and engineering to compare means across groups and identify significant differences.

14. What are the assumptions of Anova?

Ans. The assumptions of ANOVA (Analysis of Variance) include:

Independence: The observations within each group are independent of each other.

Normality: The dependent variable (the one being measured) follows a normal distribution within each group.

Homogeneity of variance: The variance of the dependent variable is equal across all groups.

Random sampling: The groups are formed by random sampling from the population.

Additivity: The effect of each group on the dependent variable is additive.

These assumptions are important because violation of any of these assumptions can lead to incorrect results and conclusions.

15. What is the difference between one way Anova and two way Anova?

Ans. One-way ANOVA (analysis of variance) and two-way ANOVA are statistical methods used to compare the means of two or more groups. The main difference between the two is the number of factors or independent variables involved in the analysis.

One-way ANOVA is used to test the hypothesis that the means of three or more groups are equal. It involves only one independent variable or factor, which has three or more levels. For example, one-way ANOVA can be used to compare the effectiveness of three different treatments for a particular medical condition.

Two-way ANOVA, on the other hand, involves two independent variables or factors. It is used to test the effects of two different factors on the mean of a dependent variable. For example, two-way ANOVA can be used to determine the effects of both gender and age on the response to a particular drug.

In summary, the key difference between one-way ANOVA and two-way ANOVA is the number of factors involved in the analysis. One-way ANOVA involves a single factor with three or more levels, while two-way ANOVA involves two factors.