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−β then β is:

a. The probability of rejecting H0 when H1 is true

b. The probability of failing to reject H0 when H1 is true

c. The probability of failing to reject H1 when H0 is true

d. The probability of rejecting H0 when H1 is true

2. In hypothesis testing, the hypothesis which is tentatively assumed to be true is called the

a. correct hypothesis

b. null hypothesis

c. alternative hypothesis

d. level of significance

3. When the null hypothesis has been true, but the sample information has resulted in the rejection of the null, a

_____ has been made

a. level of significance

b. Type II error

c. critical value

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

a. the z distribution

b. the t distribution with n - 1 degrees of freedom

c. the t distribution with n + 1 degrees of freedom

d. none of the above

5. A Type II error is the error of

a. accepting Ho when it is false

b. accepting Ho when it is true

c. rejecting Ho when it is false

d. rejecting Ho 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

a. the null hypothesis

b. the alternative hypothesis

c. a one-tailed test

d. a two-tailed test

7. In hypothesis testing, the level of significance is

a. the probability of committing a Type II error

b. the probability of committing a Type I error

c. the probability of either a Type I or Type II, depending on the hypothesis to be tested

d. none of the above

8. In hypothesis testing, b is

a. the probability of committing a Type II error

b. the probability of committing a Type I error

c. the probability of either a Type I or Type II, depending on the hypothesis to be test

d. none of the above

9. When testing the following hypotheses at an α level of significance

H0: p = 0.7

H1: p > 0.7

The null hypothesis will be rejected if the test statistic Z is

a. z > zα

b. z < zα

c. z < -z

d. none of the above

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

b. the value of the test statistic

c. the level of significance

d. All of the above are needed

11. The maximum probability of a Type I error that the decision maker will tolerate is called the

a. level of significance

b. critical value

c. decision value

d. probability value

12. For t distribution, increasing the sample size, the effect will be on

a. Degrees of Freedom

b. The t-ratio

c. Standard Error of the Means

d. All of the Above

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

13. What is Anova in SPSS?

Answer:- ANOVA (Analysis of Variance) is a statistical method used to test for differences between two or more means. In SPSS, ANOVA is a commonly used statistical technique that allows researchers to analyze the differences in means across multiple groups or conditions.

SPSS (Statistical Package for the Social Sciences) is a statistical software package that allows users to perform data analysis, including ANOVA, on large datasets. SPSS provides a user-friendly interface that allows researchers to conduct ANOVA by selecting variables and specifying analysis options through a series of menus and dialog boxes.

SPSS allows users to perform various types of ANOVA, including one-way ANOVA, factorial ANOVA, repeated measures ANOVA, and mixed-design ANOVA. These types of ANOVA can be used to analyze data from different types of research designs, such as experimental, quasi-experimental, and observational studies.

The output of ANOVA in SPSS includes tables and graphs that summarize the results of the analysis, including the means, standard deviations, F-ratios, and p-values for each group or condition. These results can be used to determine whether there are significant differences in means between groups or conditions and to draw conclusions about the research hypothesis being tested.

14. What are the assumptions of Anova?

Answer:- The ANOVA (Analysis of Variance) test is a statistical method used to test the equality of means across two or more groups. Like other statistical tests, ANOVA

has several assumptions that must be met for the results to be valid and reliable. These assumptions include:

1: Normality: The data within each group should be normally distributed. This means that the distribution of scores within each group should be approximately bell-shaped.

2: Homogeneity of Variance: The variances of the populations being compared should be equal. This means that the spread of scores in each group should be roughly the same.

3: Independence: The observations within each group should be independent of one another. This means that the scores within each group should not be related to one another.

4: Random Sampling: The data should be collected using a random sampling method to ensure that the sample is representative of the population.

If these assumptions are violated, the results of the ANOVA test may not be accurate, and alternative tests or data transformations may be required.

It is important to check the assumptions of ANOVA before conducting the analysis. There are various statistical tests and graphical methods available to check the assumptions of ANOVA, such as normality tests, tests for homogeneity of variance, and residual plots. If the assumptions are violated, appropriate measures should be taken to address the issue, such as using a different test or transforming the data.

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

Answer:- One-way ANOVA and two-way ANOVA are both statistical methods used to compare means across groups, but they differ in the number of factors being tested.

One-way ANOVA, also known as single-factor ANOVA, is used to compare means across two or more groups based on one independent variable or factor. For example, a study comparing the effectiveness of three different medications for reducing blood pressure would use a one-way ANOVA to compare the mean blood pressure across the three groups receiving each medication.

Two-way ANOVA, also known as two-factor ANOVA, is used to compare means across two or more groups based on two independent variables or factors. For example, a study examining the effects of both medication and exercise on blood pressure would use a two-way ANOVA to compare the mean blood pressure across groups defined by both medication and exercise.

In summary, the main difference between one-way ANOVA and two-way ANOVA is the number of independent variables being tested. One-way ANOVA tests the effects of a single factor, while two-way ANOVA tests the effects of two factors. Both methods can be used to compare means across groups, but two-way ANOVA allows for the examination of more complex relationships between factors.