

### STATISTICS WORKSHEET-8

**1. In hypothesis testing, type II error is represented by  $\beta$  and the power of the test is  $1-\beta$  then  $\beta$  is:**

**Answer:** 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**

**Answer:** 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**

**Answer:** 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**

**Answer:** the t distribution with  $n - 1$  degrees of freedom

**5. A Type II error is the error of**

**Answer:** accepting  $H_0$  when it is false

**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**

**Answer:** a two-tailed test

**7. In hypothesis testing, the level of significance is**

**Answer:** the probability of committing a Type I error

**8. In hypothesis testing,  $\beta$  is**

**Answer:** the probability of committing a Type II error

**9. When testing the following hypotheses at an  $\alpha$  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**

**Answer:**  $z > z_\alpha$

**10. Which of the following does not need to be known in order to compute the P-value?**

**Answer:** the level of significance

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

**Answer:** level of significance

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

**Answer:** . Degrees of Freedom

**13. What is Anova in SPSS?**

**Answer:** ANOVA (Analysis of Variance) is a statistical method used to analyze the differences between means of two or more groups. It is used to determine whether there are statistically significant differences among the means of three or more independent groups.

In SPSS, ANOVA can be performed using the "GLM" (General Linear Model) procedure. This procedure allows the user to specify a dependent variable and one or more independent variables (also known as factors) that represent the groups being compared. The user can also specify any covariates (also known as control variables) that need to be included in the analysis.

#### **14. What are the assumptions of Anova?**

**Answer: Normality:** The distribution of the dependent variable is normal within each group. Normality can be checked using statistical tests like the Shapiro-Wilk test or visual inspection of the data through histograms or Q-Q plots.

**Homogeneity of variances:** The variance of the dependent variable is equal across all groups. This assumption can be checked using statistical tests like Levene's test or visual inspection of the data through boxplots or scatterplots.

**Random Sampling:** The groups are formed randomly from the population of interest. This assumption ensures that the results of the ANOVA are generalizable to the population from which the sample was taken.

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

**Answer:** ANOVA stands for Analysis of Variance, a statistical method used to compare the means of two or more groups. One-way ANOVA and two-way ANOVA are two variations of this method that differ in the number of independent variables they analyze.

One-way ANOVA compares the means of three or more groups that are defined by a single independent variable or factor. For example, if you want to compare the mean test scores of students who have received different types of study materials (such as textbooks, online resources, and lecture notes), you would use one-way ANOVA.

Two-way ANOVA, on the other hand, compares the means of groups that are defined by two independent variables or factors. This allows you to examine the effect of each independent variable on the dependent variable, as well as any interaction between the variables. For example, if you want to compare the mean test scores of students who have received different types of study materials, but also want to see if there is a difference in scores between male and female students, you would use two-way ANOVA.