

**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  $\beta$  and the power of the test is  $1-\beta$  then  $\beta$  is:

- a. The probability of rejecting  $H_0$  when  $H_1$  is true
- b. The probability of failing to reject  $H_0$  when  $H_1$  is true
- c. The probability of failing to reject  $H_1$  when  $H_0$  is true
- d. The probability of rejecting  $H_0$  when  $H_1$  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  $H_0$  when it is false
- b. accepting  $H_0$  when it is true
- c. rejecting  $H_0$  when it is false
- d. rejecting  $H_0$  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

- 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,  $\beta$  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  $\alpha$  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

- a.  $z > z_\alpha$
- b.  $z < z_\alpha$
- 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?

One-way ANOVA in SPSS Statistics Introduction The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of two or more independent unrelated groups although you tend to only see it used when there are a minimum of three, rather than two groups.

14. What are the assumptions of Anova?

The assumptions of a One-Way ANOVA

Normality – That each sample is taken from a normally distributed population

Sample independence – that each sample has been drawn independently of the other samples

Variance Equality – That the variance of data in the different groups should be the same

Your dependent variable – here, “weight”, should be continuous – that is, measured on a scale which can be subdivided using increments (i.e. grams, milligrams)

The assumptions of a Two-Way ANOVA

Your dependent variable – here, “weight”, should be continuous – that is, measured on a scale which can be subdivided using increments (i.e. grams, milligrams)

Your two independent variables – here, “month” and “gender”, should be in categorical, independent groups.

Sample independence – that each sample has been drawn independently of the other samples

Variance Equality – That the variance of data in the different groups should be the same

Normality – That each sample is taken from a normally distributed population

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

The key differences between one-way and two-way ANOVA are summarized clearly below.

1.A one-way ANOVA is primarily designed to enable the equality testing between three or more means. A two-way ANOVA is designed to assess the interrelationship of two independent variables on a dependent variable.

2.A one-way ANOVA only involves one factor or independent variable, whereas there are two independent variables in a two-way ANOVA.

3.In a one-way ANOVA, the one factor or independent variable analyzed has three or more categorical groups. A two-way ANOVA instead compares multiple groups of two factors.

4.One-way ANOVA need to satisfy only two principles of design of experiments, i.e. replication and randomization. As opposed to Two-way ANOVA, which meets all three principles of design of experiments which are replication, randomization, and local control.