

**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

Answer – a) **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

Answer – 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

- a. level of significance
- b. Type II error
- c. critical value
- d. Type I error**

Answer – d) **Type I error**

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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**

Answer – 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

Answer – 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

- a. the null hypothesis
- b. the alternative hypothesis
- c. a one-tailed test
- d. a two-tailed test**

Answer – 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

Answer – b) **the probability of committing a Type I error**

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

Answer – b) the probability of committing a Type I 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

- a.  $z > z_\alpha$**
- b.  $z < z_\alpha$
- c.  $z < -z$
- d. none of the above

Answer – 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
- b. the value of the test statistic
- c. the level of significance**
- d. All of the above are needed

Answer – c) **the level of significance**

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

Answer - a) **level of significance**

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

Answer – 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?

Answer - Analysis of Variance, i.e. ANOVA in SPSS, is used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables

14. What are the assumptions of Anova?

Answer - There are three primary assumptions in ANOVA:

- 1) The responses for each factor level have a **normal population distribution**.
- 2) These distributions have the **same variance**.
- 3) The data are **independent**.

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

Answer - The only difference between one-way and two-way ANOVA is the number of independent variables. A one-way ANOVA has one independent variable, while a two-way ANOVA has two.

- One-way ANOVA: Testing the relationship between shoe brand (Nike, Adidas, Saucony, Hoka) and race finish times in a marathon.
- Two-way ANOVA: Testing the relationship between shoe brand (Nike, Adidas, Saucony, Hoka), runner age group (junior, senior, master's), and race finishing times in a marathon.

