

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:

- 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

Ans:D

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

• **Ans:A**

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

Ans:D

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

Ans:D

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

Ans:D

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

ANS

Ans:D

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

Ans:C

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

Ans:C

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

Ans:D

 **FLIP ROBO**

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

Ans:C

11. The maximum probability of a Type I error that the decision maker will tolerate is called the
- level of significance
 - critical value
 - decision value
 - probability value

Ans:A

12. For t distribution, increasing the sample size, the effect will be on
- Degrees of Freedom
 - The t-ratio
 - Standard Error of the Means
 - All of the Above

Ans:A

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

13. What is Anova in SPSS?

Ans: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. Essentially, ANOVA in SPSS is used as the test of means for two or more populations

14. What are the assumptions of Anova?

The assumptions of the ANOVA test are the same as the general assumptions for any parametric test:

- 1. An ANOVA can only be conducted if there is no relationship between the subjects in each sample. This means that subjects in the first group cannot also be in the second group (e.g. independent samples/between-groups).**
- 2. The different groups/levels must have equal sample sizes.**
- 3. An ANOVA can only be conducted if the dependent variable is normally distributed, so that the middle scores are most frequent and extreme scores are least frequent.**
- 4. Population variances must be equal (i.e. homoscedastic). Homogeneity of variance means that the deviation of scores (measured by the range or standard deviation for example) is similar between populations.**

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

One-way ANOVA

A one-way ANOVA (analysis of variance) has one categorical independent variable (also known as a factor) and a normally distributed continuous (i.e., interval or ratio level) dependent variable.

The independent variable divides cases into two or more mutually exclusive levels, categories, or groups.

The one-way ANOVA test for differences in the means of the dependent variable is broken down by the levels of the independent variable.

An example of a one-way ANOVA includes testing a therapeutic intervention (CBT, medication, placebo) on the incidence of depression in a clinical sample.

Note: Both the One-Way ANOVA and the Independent Samples t-Test can compare the means for two groups. However, only the One-Way ANOVA can compare the means across three or more groups.

Two-way (factorial) ANOVA

A two-way ANOVA (analysis of variance) has two or more categorical independent variables (also known as a factor), and a normally distributed continuous (i.e., interval or ratio level) dependent variable.

The independent variables divide cases into two or more mutually exclusive levels, categories, or groups. A two-way ANOVA is also called a factorial ANOVA.

An example of a factorial ANOVAs include testing the effects of social contact (high, medium, low), job status (employed, self-employed, unemployed, retired), and family history (no family history, some family history) on the incidence of depression in a population.

