STATISTICS WORKSHEET-8

1. In hypothesis testing, type II error is represented by β and the power of the test is 1−β then β is:
Ans : 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
Ans: 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
Ans : 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
Ans : the t distribution with n - 1 degrees of freedom

5. A Type II error is the error of
Ans : . accepting 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
Ans : . a two-tailed test

7. In hypothesis testing, the level of significance is
Ans : the probability of committing a Type I error

8. In hypothesis testing, b is
Ans : e probability of either a Type I or Type II, depending on the hypothesis to be tes

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
Ans:. $z < z\alpha$

10. Which of the following does not need to be known in order to compute the P-value?
Ans : the level of significance

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

12. For t distribution, increasing the sample size, the effect will be on
Ans : The t-ratio

13. What is Anova in SPSS?

Analysis of variance (ANOVA) is used when comparing the mean scores of more than two groups. One-way analysis of variance involves one independent variable (referred to as factor) which has a number of different levels (groups or conditions). The dependent variable is a continuous variable.

Analysis of variance compares the variability in scores between the different groups and the variability within each group. An F ratio is calculated; a large F ratio indicates that there is more variability between the groups (cause by the independent variable) than there is within each group (error term). A significant F test indicates that the groups differ. However, it does not indicate which of the groups differ. For this, you will need to conduct post-hoc tests.

14. What are the assumptions of Anova?
Ans : There are three primary assumptions in ANOVA:

The responses for each factor level have a normal population distribution.
These distributions have the same variance.
The data are independent.

Assumption #1: Experimental errors are normally distributed
B
$x\ BFarm1$
514.25
C $xABC$ A
$Farm1$
$x\ cFarm1$
xA
$Farm1$
508 583.25 727.5
FARM 1 C A
$x\ cFarm1$
xA
$Farm1$
508 583.25 727.5
Residuals
Calculate residuals in R:
res = residuals(lm(YIELD~VARIETY))
model=aov(YIELD~VARIETY) #Build a model with the normal ANOVA command
res=model$residuals #Create an object of the residuals of Y
“If I was to repeat my sample repeatedly and calculate the means, those
means would be normally distributed.”
Assumption #2: Equal variances between treatments
Testing for Equal Variances – Residual Plots
However, data residuals can also help us investigate whether variances are equal
Assumption #3: Independence of samples

Pseudoreplication
A particular combination of experimental design (or sampling) and statistical analysis which is inappropriate for testing the hypothesis of interest
Occurs when a number of observations or the number of data points are treated inappropriately as independent replicates
Observations may not be independent if:
(1) repeated measurements are taken on the same subject
(2) observations are correlated in time
(3) observations are correlated in space

15. What is the difference between one way Anova and two way Anova?
Ans :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.
All ANOVAs are designed to test for differences among three or more groups. If you are only testing for a difference between two groups, use a t-test instead.
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.