STATISTICS WORKSHEET

1. The owner of a travel agency would like to determine whether the mean age of the agency's customers is over 24. If so, he plans to alter the destination of their special cruises and tours. If he concludes the mean age is over 24 when it is not, he makes a _____ error. If he concludes the mean age is not over 24 when it is, he makes a _____error.

Answer→ c. Type I; Type II

2. Suppose we wish to test H0: μ =53 vs H1: μ > 53. What will result if we conclude that the mean is greater than 53 when its true value is really 55?

Answer→ b. We have made a correct decision.

3. The value that separates a rejection region from an acceptance region is called a _____.

Answer→ b. critical value

4. A hypothesis test is used to prevent a machine from under filling or overfilling quart bottles of beer. Based on sample, the machine is shut down for inspection. A thorough examination reveals there is nothing wrong with the filling machine. From a statistical point of view:

Answer→ b. A Type I error was made.

5. Suppose we wish to test H0: μ =21 vs H1 : μ > 21. Which of the following possible sample results gives the most evidence to support H1 (i.e., reject H0)? Hint: Compute Z-score.

Answer→ c. x = 17 s, = 7

6. Given H0: μ = 25, H1: μ ≠ 25, and P-value = 0.041. Do you reject or fail to reject H0 at the 0.01 level of significance?

Answer→ a. fail to reject H0.

7. A bottling company needs to produce bottles that will hold 12 ounces of liquid. Periodically, the company gets complaints that their bottles are not holding enough

liquid. To test this claim, the bottling company randomly samples 36 bottles. Suppose the p-value of this test turned out to be 0.0455. State the proper conclusion.

Answer→ c. At α = 0.05, reject the null hypothesis.

8. If a hypothesis test were conducted using α = 0.05, for which of the following p-values would the null hypothesis be rejected?

Answer→ b. 0.041

9. For H1: μ > μ0 p-value is 0.042. What will be the p-value for Ha: μ < μo?

Answer→ c. 0.958

10. The test statistic is t = 2.63 and the p-value is 0.9849. What type of test is this?

Answer→ c. Left tail.

11. The test statistic is z =2.75, the critical value is z = 2.326. The p- value is …

Answer→ a. Less than the significance level

12. The area to the left of the test statistic is 0.375. What is the probability value if this is a left tail test?

Answer→ b. 0.375

13.What is T distribution and Z distribution?

Answer→

T Distribution: - The t- distribution is like the Z- distribution but is sensitive to sample size and is used for small or moderate samples when the population standard deviation is unknown. The t-distribution is based on the sample standard deviation.

Z Distribution:- The Z distribution is a special case of the normal distribution with a mean of 0 and standard deviation of 1. The standard normal or Z distribution assumes that you know the population standard deviation.

14.Is the T distribution normal?

Answer→

The T- distribution is a type of normal distribution that is used for smaller sample sizes. Normally distribution that is used form a bell shape when plotted on a graph, with more observations near the mean and fewer observations in the tails. It was designed to factor in the greater uncertainty associated with small sample sizes. The t distribution describes the variability of the distances between sample means and the population mean when the population standard deviation is unknown and the data approximately follow the normal distribution.

15.What does the T distribution tell us?

Answer→

The T distribution is also known as Students t- distribution , it is a way of describing data that follow a bell curve when plotted on a graph, with the greatest number of observation close to the mean and fewer observation in tha tails.

It is a type of normal distribution used for smaller samples sizes, where the variance in the data is unknown

In statistics, the t distribution is most often used to :

1.Find the critical values for a confidence interval when the data is approximately normally distributed.

2. Find the corresponding p- values from a statistical test that uses the t distribution(t-tests, regression analysis)