1. The owner of a travel agency would like to determine whether or not 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.

a. Type II; Type II

b. Type I; Type I

c. Type I; Type II

d. Type II; Type I

**Ans – C**

1. 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?

a. We have made a Type I error

b. We have made a correct decision

c. We have made a Type II error

d. None of the above are correct

**Ans – B**

1. The value that separates a rejection region from an acceptance region is called a \_\_\_\_\_\_\_\_\_\_\_.

a. parameter

b. critical value

c. confidence coefficient

d. significance level

**Ans – B**

1. A hypothesis test is used to prevent a machine from under filling or overfilling quart bottles of beer. On the basis of 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:

a. Both Type I and Type II errors were made.

b. A Type I error was made.

c. A Type II error was made.

d. A correct decision was made.

**Ans – C**

1. 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.

a. x = 23 s , = 3

b. x = 19 s , = 4

c. x = 17 s , = 7

d. x = 18 s , = 6

**Ans – C**

1. 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?

a. fail to reject H0

b. not sufficient information to decide

c. reject H0

**Ans – C**

1. 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.

a. At α = 0.085, fail to reject the null hypothesis.

b. At α = 0.035, accept the null hypothesis.

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

d. At α = 0.025, reject the null hypothesis.

**Ans – C**

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

a. 0.100

b. 0.041

c. 0.055

d. 0.060

**Ans – B**

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

a. 0.084

b. 0.021

c. 0.958

d. 0.042

**Ans – B**

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

a. Right tail

b. Two tail

c. Left tail

d. Can’t tell

**Ans – B**

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

a. Less than the significance level

b. Equal to the significance level

c. Large than the significance level

**Ans – A**

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

a. 0.750

b. 0.375

c. 0.1885

d. 0.625

**Ans – B**

1. What is T distribution and Z distribution?

‘T’ distribution and ‘Z’ distribution are both probability distributions used in statistical hypothesis testing.

‘Z’ distribution, also known as the standard normal distribution, is an normal distribution with a mean of zero and a standard deviation of one. It is often used when the population standard deviation is known, and the sample size is large (typically n >30). The ‘Z’ distribution is important in hypothesis testing because it allows us to calculate probabilities and critical values for a given level of significance.

‘T' distribution also known as the student’s t-distribution is similar to the Z distribution, but with fatter tails. It is used when the population standard deviation is unknown, and the sample size is small (typically n<30). The shape of the T – distribution depends on the degrees of freedom, which is based on the sample size. As the sample size increases, the T distribution approaches the Z distribution.

In general, the choice between using a Z – distribution or T distribution in hypothesis testing depends on the sample size whether or not the population standard deviation is known.

1. Is the T distribution normal?

The t-distribution is not exactly normal, but it approaches a normal distribution as the sample size increases. The shape of the t-distribution depends on the sample size and is more spread out and flatter than the normal distribution. As the sample size increases, the t-distribution becomes closer to a normal distribution with an mean of 0 and standard deviation of 1

1. What does the T distribution tell us?

The t-distribution is a probability distribution that is used in hypothesis testing when the sample size is small or when the population standard deviation is unknown. It is a bell – shaped distribution that is similar to the normal distribution but has heavier tails, meaning it has more probability in the tails and less in the center compared to the normal distribution.

The t- distribution tells us the likelihood of obtaining a certain t-value when sampling from a population with an unknown standard deviation, taking in to account the sample size and the degrees of freedom. It is used to calculate confidence intervals and to test hypotheses about population means when the sample size is small. The t-distribution is an important statistical tool in fields such as economics, psychology, and biology, were sample sizes are often small and the population standard deviation is unknown.