STATISTICS WORKSHEET-9

**Q1 to Q12 have only one correct answer. Choose the correct option to answer your question.**

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.

1. Type II; Type II
2. Type I; Type I
3. Type I; Type II
4. Type II; Type I
5. 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?
6. We have made a Type I error
7. We have made a correct decision
8. We have made a Type II error
9. None of the above are correct
10. The value that separates a rejection region from an acceptance region is called a .
    1. parameter
    2. critical value
    3. confidence coefficient
    4. significance level
11. 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:
12. Both Type I and Type II errors were made.
13. A Type I error was made.
14. A Type II error was made.
15. A correct decision was made.
16. 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

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?
2. fail to reject H0
3. not sufficient information to decide
4. reject H0
5. 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.
6. At α = 0.085, fail to reject the null hypothesis.
7. At α = 0.035, accept the null hypothesis.
8. At α = 0.05, reject the null hypothesis.
9. At α = 0.025, reject the null hypothesis.
10. 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

9 . 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

1. The test statistic is t = 2.63 and the p-value is 0.9849. What type of test is this?
2. Right tail
3. Two tail
4. Left tail
5. Can't tell
6. The test statistic is z =2.75, the critical value is z = 2.326. The *p*- value is …
7. Less than the significance level
8. Equal to the significance level
9. Large than the significance level
10. 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

**Q13 to Q15 are subjective answers type questions, Answers them in their own words briefly**. 13.What is T distribution and Z distribution?

**Ans**  The T distribution, also known as the students t distribution, is a type of probability distribution that is similar to the normal distribution with its bell shape but has heavier tails . T distributions have a greater chance for extreme values than normal distributions , hence the fatter tails

14.Is the T distribution normal?

Ans: Like the **normal distribution**, the **t**-**distribution** is symmetric. If you think about folding it in half at the mean, each side will be the same. Like a standard **normal distribution** (or z-**distribution**), the **t**-**distribution** has a mean of zero. The **normal distribution** assumes that the population standard deviation is known.

15.What does the T distribution tell us?

Ans: Tail heaviness **is** determined by a parameter of the **T distribution** called degrees of freedom, with smaller values giving heavier tails, and with higher values making the **T distribution** resemble a standard normal **distribution** with a mean of 0, and a standard deviation of 1.