STATISTICS WORKSHEET-10

1. Rejection of the null hypothesis is a conclusive proof that the alternative hypothesis is

   a. True
   b. False
   c. Neither

   Ans: c. Neither

2. Parametric test, unlike the non-parametric tests, make certain assumptions about

   a. The population size
   b. The underlying distribution
   c. The sample size

   Ans: b. The underlying distribution

3. The level of significance can be viewed as the amount of risk that an analyst will accept when making a decision

   a. True
   b. False

   Ans: a. True

4. By taking a level of significance of 5% it is the same as saying

   a. We are 5% confident the results have not occurred by chance
   b. We are 95% confident that the results have not occurred by chance
   c. We are 95% confident that the results have occurred by chance

   Ans: b. We are 95% confident that the results have not occurred by chance

5. One or two tail test will determine

   a. If the two extreme values (min or max) of the sample need to be rejected
   b. If the hypothesis has one or possible two conclusions
   c. If the region of rejection is located in one or two tails of the distribution

   Ans: c. If the region of rejection is located in one or two tails of the distribution

6. Two types of errors associated with hypothesis testing are Type I and Type II. Type II error is committed when

a. We reject the null hypothesis whilst the alternative hypothesis is true
b. We reject a null hypothesis when it is true
c. We accept a null hypothesis when it is not true

Ans: c. We accept a null hypothesis when it is not true

7. A randomly selected sample of 1,000 college students was asked whether they had ever used the drug Ecstasy. Sixteen percent (16% or 0.16) of the 1,000 students surveyed said they had. Which one of the following statements about the number 0.16 is correct?

a. It is a sample proportion.
b. It is a population proportion.
c. It is a margin of error.
d. It is a randomly chosen number.

Ans: a. It is a sample proportion.

8. In a random sample of 1000 students, $\hat{p} = 0.80$ (or 80%) were in favour of longer hours at the school library. The standard error of $\hat{p}$ (the sample proportion) is

a. .013
b. .160
c. .640
d. .800

Ans: a. .013

9. For a random sample of 9 women, the average resting pulse rate is $x = 76$ beats per minute, and the sample standard deviation is $s = 5$. The standard error of the sample mean is

a. 0.557
b. 0.745
c. 1.667
d. 2.778

Ans: c. 1.667

10. Assume the cholesterol levels in a certain population have mean μ= 200 and standard deviation σ = 24. The cholesterol levels for a random sample of n = 9 individuals are measured and the sample mean x is determined. What is the z-score for a sample mean x = 180?

a. –3.75
b. –2.50
c. −0.83
d. 2.50

Ans: b. –2.50

11. In a past General Social Survey, a random sample of men and women answered the question "Are you a member of any sports clubs?" Based on the sample data, 95% confidence intervals for the population proportion who would answer "yes" are .13 to .19 for women and .247 to .33 for men. Based on these results, you can reasonably conclude that

a. At least 25% of American men and American women belong to sports clubs.
b. At least 16% of American women belong to sports clubs.
c. There is a difference between the proportions of American men and American women who belong to sports clubs.
d. There is no conclusive evidence of a gender difference in the proportion belonging to sports clubs.

Ans: c. There is a difference between the proportions of American men and American women who belong to sports clubs.

12. Suppose a 95% confidence interval for the proportion of Americans who exercise regularly is 0.29 to 0.37. Which one of the following statements is FALSE?

a. It is reasonable to say that more than 25% of Americans exercise regularly.
b. It is reasonable to say that more than 40% of Americans exercise regularly.
c. The hypothesis that 33% of Americans exercise regularly cannot be rejected.
d. It is reasonable to say that fewer than 40% of Americans exercise regularly

Ans: b. It is reasonable to say that more than 40% of Americans exercise regularly.

13. How do you find the test statistic for two samples?

Test statistic is a number calculated from a statistical test of a hypothesis. It describes how closely the distribution of our data matches the distribution predicted under the null hypothesis. It is used to calculate the p value based on the test result, to decide whether to reject or accept null hypothesis.

Two sampled T Test compares the means of two independent groups in order to determine whether there is statistical evidence that the associated population means are equal or not.

14. How do you find the sample mean difference?

The mean difference, or difference in means, measures the difference between the mean value in two different groups. It gives an idea of how much difference there is between the averages of the experimental group and control groups.

But this difference doesn't tell us a lot, the number may be statistically significant or there could be random variations. In order to test the hypothesis that our results could be significant, we have to run a hypothesis test for differences between means.

To compare two independent means, we will run a two sample t test This test assumes that the variances for both samples are equal.
For dependent samples we run a paired sample t test.

15. What is a two sample t test example?

Below are few examples where two-sample T-test can be used:

- To compare the average test scores of two classes from two different schools
- To compare the average weights of two different groups of people
- Difference in height between men and women.
- To check whether work experience impacts job satisfaction.
- To examine any changes in productivity levels after introducing a new system/software at work.
- Evaluating if there is a difference in math scores between boys and girls.
- Assessing to see if there is any difference in blood pressure levels between patients taking medication and those not taking medications.