1. Statistical inference is the process of drawing formal conclusions from data.
   1. **True**
   2. False
2. Which of the following testing is concerned with making decisions using data?
   1. Probability
   2. **Hypothesis**
   3. Causal
   4. None of the mentioned
3. Which of these is a type of T-test?
   1. One sample t-test.
   2. Independent two-sample t-test.
   3. Paired sample t-test.
   4. **All of these**
4. The T-test tells you about the significant difference between the two groups. True or false?
   1. **True**
   2. False
5. A t-test is a significance test that assesses
   1. **The means of two independent groups**
   2. The medians of two dependent groups
   3. The modes of two independent variables
   4. The standard deviation of three independent variables
6. Point out the correct statement.
   1. Power of a one sided test is lower than the power of the associated two sided test
   2. Power of a two sided test is greater than the power of the associated one sided test
   3. Hypothesis testing is less commonly used
   4. **None of the mentioned**

Comment: Power of a one sided test is greater than the power of the associated two sided test.

1. To use a t-test, the dependent variable must have
   1. Nominal or interval data
   2. Ordinal or ratio data
   3. **Interval or ratio data**
   4. Ordinal or interval data
2. Statistical significance or the probability of finding statistical significance is also known as
   1. Degrees of freedom (df)
   2. **P-value**
   3. Standard deviation (sd)
   4. A constant source of frustration!
3. 3. Which of the following value is the most common measure of “statistical significance”?
   1. **P**
   2. A
   3. L
   4. All of the mentioned

Comment: The P-value is the probability under the null hypothesis of obtaining evidence as extreme or more extreme than would be observed by chance alone

1. T-tests and other significance tests are frequently criticized. Over-representation of statistical significance in research may result in:
   1. **Publication bias**
   2. Researcher fatigue
   3. Lost funding
   4. Confused graduate students
2. The three types of t-tests are
   1. **One-sample t-tests**
   2. Null Hypothesis t-tests
   3. **Independent sample t-tests**
   4. **Paired samples t-tests**
   5. Variable t-tests
3. An independent t-test can be used to assess which of the following?
   1. It assesses differences between scores obtained on two separate occasions from the same participants
   2. It assesses goodness of fit
   3. It assesses how many factors there are in questionnaire data
   4. **It assesses differences between two groups of participants**
   5. It assesses relationships between two interval data sets
   6. It assesses relationships between two ratio data sets
4. A repeated measures t-test can be used to assess which of the following?
   1. It assesses differences between two groups of participants
   2. **It assesses differences between scores obtained on two separate occasions from the same participants**
   3. It assesses relationships between two interval data sets
   4. It assesses goodness of fit
   5. It assesses relationships between two ratio data sets
   6. It assesses how many factors there are in questionnaire data
5. What assumption(s) must be met to conduct an independent-samples t-test?
   1. The data from the dependent variable must be normally distributed
   2. The data from two cases are not linked in any way
   3. There is equal variance in scores between the groups
   4. There must be random sampling of cases
   5. The data from the dependent variable must be interval or ratio
   6. **All of these**
6. In which of the following cases would an independent-samples t-test not be appropriate?
   1. **Comparing students attitude change between the start and end of their degree**
   2. Comparing levels of aggression between 1 group who experienced high levels of excitation and 1 group who remained calm
   3. Comparing younger and older adults level of teamwork
   4. Comparing men and women's IQ on one occasion
   5. Comparing the performance of individuals who either consumed caffeine or did not
   6. Comparing the attitudes of Eastern and Western individuals
7. Which of the following statistics are important when interpreting an independent samples t-test?
   1. T scores
   2. Mean difference
   3. Significance level
   4. Levene's test
   5. Descriptive statistics
   6. **All of these**
8. Where would you look on an independent t-test output to identify whether there was a significant difference between the groups?
   1. The F column
   2. The correlation coefficient box
   3. The confidence interval columns
   4. The descriptive statistics box
   5. Levene's test column
   6. **T-test for equality of mean section**
9. Which of the following formats is correct for reporting an independent samples t-test in APA format?
   1. F (17, 24) = 235.98, p < 0.05
   2. N = 22, P = 0.000, T = 1.489
   3. r(18) = +.987, p = 0.06
   4. **t(34) = -.478, p < 0.001.**
   5. None of these
   6. U (22) = 5658, p > 0.05
10. What is the alternative name for a repeated-measures t-test?
    1. Pearson's Product-Moment
    2. Spearman's Rho
    3. A Wilcoxon test
    4. Chi-squared test of difference
    5. **A paired-samples t-test**
    6. Unrelated t-test
11. In which of the following cases could you use a paired-samples t-test?
    1. **When comparing the same participants performance before and after training**
    2. When assessing relationships between two groups
    3. When assessing three groups or more
    4. When comparing two separate groups
    5. When comparing men and women's scores
    6. When assessing goodness of fit
12. What are matched cases?
    1. Scores are compared across two distinct groups of participants
    2. A way of transforming data to make it more normally distributed
    3. Scores obtained from the same participants at time 1 and time 2 are standardized and compared
    4. **Scores are obtained from a second group of participants who are matched on vital characteristics with the first group of participants**
    5. Scores obtained from the same participants at time 1 and time 2 are not standardized but compared
    6. A tool for adjusting the alpha criterion
13. Which of the following statements is false?
    1. The t distribution is symmetric about zero
    2. The t distribution is more spread out than the standard normal distribution
    3. **As the degrees of freedom get smaller, the t-distribution’s dispersion gets smaller**
    4. The t distribution is mound-shaped
14. For statistical inference about the mean of a single population when the population standard deviation is unknown, the degrees for freedom for the t distribution equal n-1 because we lose one degree of freedom by using the:
    1. **sample mean as an estimate of the population mean**
    2. sample standard deviation as an estimate of the population standard deviation
    3. sample proportion as an estimate of the population proportion
    4. sample size as an estimate of the population size
15. In testing the hypotheses

<<<EQUATION>>>Null hypothesis: mu = 200

<<<EQUATION>>>Alternative hypothesis: mu less than 200

the sample mean is found to be 120. The null hypothesis:

* 1. should be rejected
  2. should not be rejected
  3. should be rejected only if n > 30
  4. **none of the above answers is correct**

1. For a sample of size 20 taken from a normally distributed population with standard deviation equal to 5, a 90% confidence interval for the population mean would require the use of:
   1. t = 1.328
   2. t = 1.729
   3. t = 2.12
   4. **z = 1.645**
2. Under which of the following circumstances is it impossible to construct a confidence interval for the population mean?
   1. A non-normal population with a large sample and an unknown population variance
   2. A normal population with a large sample and a known population variance
   3. **Non-normal population with a small sample and an unknown population variance**
   4. A normal population with a small sample and an unknown population variance
3. Suppose that a one-tail t test is being applied to find out if the population mean is less than 100. The level of significance is .05 and 25 observations were sampled. The rejection region is:
   1. t > 1.708
   2. **t < -1. 711**
   3. t > 1.318
   4. t < -1.316
4. Which of the following is true about the t distribution?
   1. Approaches the normal distribution as its degrees of freedom increase
   2. Assumes the population is normally distributed
   3. It is more spread out than the standard normal distribution
   4. **All of the above statements are true**
5. The null hypothesis in the chi-square test states that
   1. The rows and columns in the table are associated
   2. **The rows and columns in the table are not associated**
   3. Neither of the two
6. Contingency tables and degrees of freedom are key elements of the chi-square test
   1. **True**
   2. False
7. For the chi-square test to be effective, the expected value for each cell in the contingency table has to be at least
   1. 3
   2. **5**
   3. 10
8. The null hypothesis of the sign test is that
   1. **Half the ranks to be less than the median and half greater than the median**
   2. Half the ranks to be less than the mean and half greater than the mean
   3. The lower half the ranks to have the same mean as the upper half
   4. The lower half the ranks to have the same standard deviation as the upper half
9. The null hypothesis for the Mann-Whitney U test is used to test that
   1. Two samples are from different populations
   2. Two samples are from different populations but have the same mean
   3. Two samples are from the same population and have the same mean
   4. **Two samples are from the same population and have the same median**
10. Rejection of the null hypothesis is a conclusive proof that the alternative hypothesis is
    1. True
    2. False
    3. **Neither**
11. Parametric test, unlike the non-parametric tests, make certain assumptions about
    1. The population size
    2. **The underlying distribution**
    3. The sample size

*Comment: Parametric methods make assumptions about the underlying distribution from which sample populations are selected. Nonparametric methods make no assumptions about the sample population distribution. Parametric statistical tests assume that your data is approximately normally distributed (follows a classic bell-shaped curve) and that the data is at the interval/ratio level of measurement.*

1. The level of significance can be viewed as the amount of risk that an analyst will accept when making a decision
   1. **True**
   2. False

*Comment: If level of significance is, for example 0.05, then this means that 5% of the cases might be randomly generated and that an analysis is certain that 95% of the cases comply with the hypothesis. In this respect, the level of significance can be viewed as the risk factor.*

1. By taking a level of significance of 5% it is the same as saying
   1. We are 5% confident the results have not occurred by chance
   2. **We are 95% confident that the results have not occurred by chance**
   3. We are 95% confident that the results have occurred by chance

*Comment: If an analyst states that the results are significant at the 5% level then what they are saying is that there is a 5% probability that the sample data values collected have occurred by chance. An alternative view is to use the concept of a confidence interval. In this case we can observe that we are 95% confident that the results have not occurred by chance.*

1. One or two tail test will determine
   1. If the two extreme values (min or max) of the sample need to be rejected
   2. If the hypothesis has one or possible two conclusions
   3. **If the region of rejection is located in one or two tails of the distribution**
2. Two types of errors associated with hypothesis testing are Type I (False positive) and Type II (false negative). Type II error is committed when
   1. We reject the null hypothesis whilst the alternative hypothesis is true
   2. We reject a null hypothesis when it is true
   3. **We accept a null hypothesis when it is not true**
3. In general, the expected frequencies per cell in the conduct of a Chi-Square test are those one would
   1. expect to find in a given cell if either the null hypothesis or the alternative hypothesis were actually true
   2. expect to find in a given cell if the null hypothesis were actually false
   3. **expect to find in a given cell if the null hypothesis were actually true**
   4. expect to find in a given cell if the alternative hypothesis were actually true
4. The degrees of freedom for the Chi-Square test statistic when testing for independence in a contingency table with 4 rows and 4 columns would be
   1. 5
   2. 7
   3. **9**
   4. 12
5. Each of the following accurately represents characteristics of the Chi-Square distribution except for:
   1. As the degrees of freedom increase, the critical value of the chi-square distribution becomes larger.
   2. It is a positively skewed distribution.
   3. **The region of rejection is always in the left-tail of the Chi-Square distribution.**
   4. Its shape depends on the number of degrees of freedom.
6. The null hypothesis for the Chi-Square test of independence should specify
   1. that the two numerical variables are dependent
   2. that the two numerical variables are independent
   3. that the two categorical variables are dependent
   4. **that the two categorical variables are independent**
7. Which of the following values of the Chi-Square test statistic would be most likely to suggest that the null hypothesis were really true?
   1. 23.7183
   2. 18.3445
   3. **0.3251**
   4. 14.9728
8. Which of the following values of the chi-square distribution cannot occur?
   1. **-2.45**
   2. 100.0
   3. 0.61
   4. 38.4
9. To determine whether a set of observed frequencies differ from their corresponding expected frequencies, we could apply the
   1. F test.
   2. t test for dependent samples.
   3. t test for independent samples.
   4. **chi-square test.**
10. When using the chi-square test for differences in two proportions with a contingency table that has r rows and c columns, the degrees of freedom for the test statistic will be:
    1. n1 + n2 - 2.
    2. **(r - 1)(c - 1).**
    3. (r - 1) + (c - 1).
    4. n -1.