# 1 Question

the one sample t-test, the one sample sign test, and the one sample Wilcoxon signed rank test.

- State the general statistical assumptions needed for applying these tests,and explain how the assumptions needed for applying these tests differ from each other.

- State the null hypotheses of the tests and explain how the null hypotheses of these tests differ from each other. State also the alternative hypotheses of the tests and explain how the alternative hypotheses of these tests differ from each other.

- Which one of these three tests requires the mildest assumptions?

**Answer**   A)

- The one sample t-test compares the expected value of a random variable to a given constant and assumed that the observations follow the normal distribution.

- the sign test requires milder distributional assumptions and takes value from continuous variable

- the one sample Wilcoxon signed rank test requires milder distributional assumptions. It assumes the data are symmetrically distributed around the median.

  The t-test has the strongest assumption (normality of the data). The sign test has the mildest assumptions since it only requires ordinal data. The Wilcoxon signed rank test relaxes the normality assumption but still requires symmetry in the distribution.

B)

- One Sample T test The mean of the population is equal to a specified value ( = μ0) The null hypothesis: H0 : μ = μ0. The possible alternative hypotheses: H1 : μ > μ0 (one tailed), H1 : μ < μ0 (one tailed), H1 : μ = μ0 (two tailed).

- One sample sign test The median of the population is equal to a specified value (Median = m0) The null hypothesis: H0 : m = m0. Possible alternative hypotheses: H1 : m > m0 (one tailed), H1 : m < m0 (one tailed), H1 : m = m0 (two tailed).

- Wilcxon signed test Here m is the population median, and m0 is the population median The null hypothesis H0: m = m0. Possible alternative hypotheses: H1: m > m0 (one tailed), H1: m < m0 (one tailed), H1: m = m0 (two tailed).

C) Sign test