One method for assessing the bioavailability of a drug is to measure its concentration in blood and/or urine samples at certain points in time after administering the drug. Suppose we want to compare the concentrations of two types of aspirin (types A and B) in urine samples taken from the same person, 1 hour after he or she has taken the drug. Hence, a specific dosage of either type A or type B aspirin is administered at zero time, and after 1 hour a urine concentration is measured.

One week later, after the first aspirin dosage has presumably been cleared from the system, the same dosage of the other aspirin is given to the same person and after 1 hour another urine concentration is measured.

Because the order of the drug administration (AB or BA) may affect the results, a random numbers table was used to decide which of the two types of aspirin to give first.

The experiment is performed on 10 people; the results are given in the following table.

|  |  |  |
| --- | --- | --- |
| Person | Aspirin A 1-hour concentration (mg%) | Aspirin B 1-hour concentration (mg%) |
| 1 | 19 | 16 |
| 2 | 23 | 19 |
| 3 | 16 | 12 |
| 4 | 21 | 22 |
| 5 | 17 | 15 |
| 6 | 20 | 22 |
| 7 | 10 | 12 |
| 8 | 30 | 25 |
| 9 | 13 | 10 |
| 10 | 16 | 13 |

a) What are the relevant hypotheses?

b) Perform an appropriate parametric statistical procedure to test these hypotheses and briefly explain your results ( level = 0.05).

c) Perform an appropriate non-parametric statistical procedure to test these hypotheses and briefly explain your results ( level = 0.05).

d) Compare your results in parts (b) and (c), and discuss which method you feel to be a better fit here.