R University

Statistics Exam 2024-03-13 **Exam ID 00001**

Name: _____

Student ID: _____

Signature: _____

1. (a) [X] (b) [X] (c) [ ] (d) [X] (e) [ ]

1. **Problem**
   The waiting time (in minutes) at the cashier of two supermarket chains with different cashier systems is compared. The following statistical test was performed:

```
    Two Sample t-test

data:  Waiting by Supermarket
t = 4.1777, df = 108, p-value = 2.996e-05
alternative hypothesis: true difference in means between group Sparag and group Consumo is g
95 percent confidence interval:
 1.241878      Inf
sample estimates:
 mean in group Sparag mean in group Consumo
            5.419987              3.360063
```

   Which of the following statements are correct? (Significance level 5%)

   (a) The absolute value of the test statistic is larger than 1.96.

   (b) A one-sided alternative was tested.

   (c) The p-value is larger than 0.05.

   (d) The test shows that the waiting time is longer at Sparag than at Consumo.

   (e) The test shows that the waiting time is shorter at Sparag than at Consumo.

   Solution

   (a) True. The absolute value of the test statistic is equal to 4.178.

   (b) True. The test aims at showing that the difference of means is larger than 0.

   (c) False. The p-value is equal to 3e-05.

   (d) True. The test result is significant ($p < 0.05$) and hence the alternative is shown that the difference of means is larger than 0.

   (e) False. The test aims at showing that the waiting time at Sparag is longer than at Consumo.