

## EXAM OF STATISTICS (DESCRIPTIVE STATISTICS AND REGRESSION)

Pharmacy/Biotechnology 1st year

Version A

December, 16 2019

Name:

DNI:

Group:

**Duration:** 1 hour.

- (5 pts.) 1. The table below summarizes the time (in minutes) required to remove anesthesia after a surgery in a sample of 50 patients.

Time	Patients
10 – 30	2
30 – 45	11
45 – 60	18
60 – 90	9
90 – 120	8
120 – 180	2

- Are there some outliers in the sample?
- Compute the mean. Is it representative?
- If according to a postoperative protocol the 15% of patients that require more time to remove the anesthesia must be monitored, above what time should a patient be monitored?
- If we apply a drug that is anesthesia antagonist, it is known that the time required to remove the anesthesia decreases a 25%. How will the time decrease affect the representativeness of the mean?
- If it is known that another type of anesthesia  $B$  has mean 50 minutes and standard deviation 15 minutes, what time is relatively greater, 70 minutes with this type of anesthesia or 60 minutes with the type  $B$ ?

Use the following sums for the computations:  $\sum x_i n_i = 3212.5 \text{ min}$ ,  $\sum x_i^2 n_i = 249706.25 \text{ min}^2$ ,  $\sum (x_i - \bar{x})^3 n_i = 1400531.25 \text{ min}^3$  y  $\sum (x_i - \bar{x})^4 n_i = 143958437.7 \text{ min}^4$ .

- (5 pts.) 2. The table below summarizes the scores of a group of 10 students in three practical exams of Maths.

Exam 1( $X$ )	Exam 2( $Y$ )	Exam 3( $Z$ )
5.5	3.2	5.0
7.5	6.5	2.0
2.5	4.0	1.0
6.0	4.0	6.0
8.0	7.5	6.0
4.0	3.5	1.0
7.0	5.5	4.0
9.5	10.0	9.0
10.0	9.5	8.0
1.0	3.0	0.5

- Which two scores are more linearly correlated?
- Using linear models, what are the expected scores of the second and third exams for a student with a score 6.5 in the first exam?

Use the following sums for the computations:

$$\begin{aligned}\sum x_i &= 61, \sum y_i = 56.7, \sum z_i = 42.5, \\ \sum x_i^2 &= 449, \sum y_i^2 = 382.49, \sum z_i^2 = 264.25, \\ \sum x_i y_i &= 405.85, \sum x_i z_i = 327, \sum y_i z_i = 295.\end{aligned}$$