

EXAM OF STATISTICS (DESCRIPTIVE STATISTICS AND REGRESSION)

Pharmacy/Biotechnology 1st year

Version A

February, 8 2021

Name:

DNI:

Group:

Duration: 1 hour.

- (5 pts.) 1. Laetisarinic acid is a compound that can be used to control fungal diseases in some plantations. The table below shows the radial growth (in cm) of the fungus *Pleurotus ostreatus* exposed to different concentrations of laetisarinic acid (in mg/l).

Laetisarinic acid (mg/l)	0.0	0	3.0	3.0	6	6	10.0	10.0	20.0	20.0	30.0	30
Fungus growth (cm)	33.3	31	29.8	27.8	28	29	25.5	23.8	18.3	15.5	11.7	10

- Compute the equation of the regression line that best explains fungal growth as a function of acid concentration.
- Compute the linear correlation and determination coefficients and interpret them.
- How much does the fungal population increase or decrease for each one mg/dl increment in acid concentration?
- What are the expected fungal growths for acid concentrations of 20 and 200 mg/l? Which of these predictions is more reliable?

Use the following sums for the computations: $\sum x_i = 138$ mg/l, $\sum y_i = 283.7$ cm, $\sum x_i^2 = 2890$ (mg/l)², $\sum y_i^2 = 7384.49$ cm² and $\sum x_i y_i = 2334.8$ mg/l · cm.

- (5 pts.) 2. The table below shows the blood uric acid concentration of 8 men and 10 women in mg/dl.

Men (X)	4.7	3.6	5.2	6.8	9.5	4.8	5.6	5.4		
Women (Y)	3.2	4.5	5.4	2.1	6.7	5.2	3.8	4.3	7.2	2.6

Se pide:

- In which group, men or women, is the mean more representative?
- In which group, men or women, is the uric acid distribution more symmetric?
- In which group, men or women, is the uric acid distribution flatter?
- Can we assume that the uric acid sample from women comes from a normal population?
- What uric acid concentration must a woman have to be relative higher than 6 mg/dl in a man?
- If all the values of the variable X are multiplied by a number, what must that number be to make the mean of the new variable as representative as the mean of Y ?

Use the following sums for the computations:

Men: $\sum x_i = 45.6$ mg/dl, $\sum x_i^2 = 282.14$ (mg/dl)², $\sum (x_i - \bar{x})^3 = 45.06$ (mg/dl)³ and $\sum (x_i - \bar{x})^4 = 231.15$ (mg/dl)⁴.

Women: $\sum y_i = 45$ mg/dl, $\sum y_i^2 = 227.52$ (mg/dl)², $\sum (y_i - \bar{y})^3 = 8.17$ (mg/dl)³ and $\sum (y_i - \bar{y})^4 = 126.77$ (mg/dl)⁴.