EXAM OF STATISTICS
(PROBABILITY AND RANDOM VARIABLES)

2nd Physiotherapy **Version A** **May, 5 2021**

Name: DNI: Group:

Duration: 1 hour.

(3 pts.) 1. The average number of injuries in an international tennis tournament is 2.

(a) Compute the probability that in an international tennis tournament there are more than 2 injuries.

(b) If a tennis circuit has 6 international tournaments, what is the probability that there are no injuries in some of them?

(4 pts.) 2. The tables below corresponds to two tests A and B to detect an injury that have been applied to the same sample.

Test A	Injury	No injury
+	87	14
−	33	866

Test B	Injury	No injury
+	104	115
−	16	765

(a) Which test is more sensitive? Which one is more specific?

(b) Acording to the predictive values, which test is better to diagnose the injury? Which one is better to rule out the injury?

(c) Assuming that both tests are independent, what is the probability of getting a right diagnose with both tests if we apply both tests to a healthy person?

(d) Assuming that both tests are independent, what is the probability of getting at least a positive outcome if we apply both tests to a random person?

(3 pts.) 3. A study tries to determine the effect of a low fat diet in the lifetime of rats. The rats where divided into two groups, one with a normal diet and another with a low fat diet. It is assumed that the lifetimes of both groups are normally distributed with the same variance but different mean. If 20% of rats with normal diet lived more than 12 months, 5% less than 8 months, and 85% of rats with low fat diet lived more than 11 months,

(a) Compute the means and the standard deviation of the lifetime of rats following a normal diet and a low fat diet?
Remark: If you do not know how to compute them, for the next part use a mean of 11 months and a standard deviation of 1.5 months for normal diet rats, and a mean of 12.5 months for low fat diet rats.

(b) If 40% of the rats were under a normal diet, and 60% of rats under a low fat diet, what is the probability that a random rat die before 9 months?