STATISTICS APPLIED TO BUSINESS ADMINISTRATION. ACADEMIC YEAR 2012-2013
SEMINAR 1 (40 MINUTES)

Date: ____________

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EXERCISE 1 (3 POINTS)

The probability that a person watches a given TV program is 0.20. We assume independence between the different people watching TV.

1. **(0.5 points)** If we take a random sample of 20 people, what would be the probability that 5 of them watch the TV program?
2. **(0.5 points)** What would be the probability that, among the aforementioned 20 people, there are more than 5 people that **do not** watch the TV program?
3. **(1 point)** If we now take a random sample of 225 people, what would be the approximate probability that, among them, there are no more than 41 people that watch the TV program?
4. **(1 point)** We know that, during advertisements linked to that TV program, the probability that a person does not change the TV channel to another one is 0.02. If we take a random sample of 200 people, what would be the approximate probability that, among them, there are at least 8 people that do not change to another TV channel?

EXERCISE 2 (2 POINTS)

The number of people that arrive each hour at a second hand clothes store follows a Poisson distribution with mean equal to 6. We assume independence between the different people entering the store.

1. **(0.5 points)** What is the probability that, in a given hour, exactly 6 people arrive at the store?
2. **(1 point)** What is the probability that, in a period of 6 hours, at least 30 people arrive at the store?
3. **(0.5 points)** What is (are) the most likely number(s) of clients that arrive, in a given hour, at the store?

EXERCISE 3 (3 POINTS)

Let Z be a random variable such that $Z \in b(0.3, 15)$. Compute the following probabilities:

1. **(1 point)** $P(Z \in [4, 13])$
2. **(1 point)** $P(Z \notin [2, 7])$
3. **(1 point)** $P(Z = 16)$

EXERCISE 4 (2 POINTS)

Let X be a random variable having a Poisson distribution with mean equal to 2.8.

1. **(1 point)** What is the probability that the random variable X takes on values no larger than 2?
2. **(1 point)** If we now consider the random variable $Z = X_1 + \ldots + X_{20}$, where $X_1, \ldots, X_{20}$, are independent and identically distributed (i.i.d.) random variables following each a Poisson distribution with mean equal to 2.8, what would be the probability that Z takes exactly the value 42?

Remark: This piece of paper should be handed in together with your solutions to the aforementioned exercises. You should also write, both on this piece of paper and in the solutions you provide, the names of the students in your group that have actively participated in this seminar activity.