STATISTICS APPLIED TO BUSINESS ADMINISTRATION
SEMINAR 2

Date: _____

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EXERCISE 1 (2.5 POINTS)

The probability that, when a given potential client calls a food delivery store, the line is busy is 0.08. We assume independence between the different incoming calls.

1. **(0.75 points)** If the client calls 10 times, what is the probability that for exactly 4 of them the line is busy?

2. **(0.75 points)** If the client calls 75 times, what is the approximate probability that for more than 8 of them the line is busy?

3. **(1 point)** If the client calls 600 times, what is the approximate probability that for no more than 50 of them the line is busy?

EXERCISE 2 (2.5 POINTS)

A public servant exam candidate must answer a 10 multiple choice type questionnaire. The probability of answering each question in the right way is 0.70.

1. **(0.75 points)** What is the probability that the candidate provides the correct answer for all of the questions in the exam?

2. **(0.75 points)** What is the probability that the candidate provides the correct answer for at most 5 questions?

3. **(1 point)** If the exam had 100 questions, what would be the approximate probability that the candidate provides the correct answer for at least 78 questions?

EXERCISE 3 (2.5 POINTS)

The number of clients that arrives by car at the parking lot of a given entertainment place per hour follows a Poisson distribution with mean equal to 4. We assume independence between the different client arrivals.

1. **(0.5 points)** What is the probability that, **in two** hours, at least 5 clients arrive?

2. **(0.5 points)** What is the approximate probability that, in one working day (in which the place remains open for 9 hours), fewer than 30 clients arrive?

3. **(1 point)** What should it be the minimum capacity the place should have so that, with probability of at least 0.97, all clients that arrive in a given hour can park without any problem?

4. **(0.5 points)** What is the most likely number of clients that would arrive per hour?

EXERCISE 4 (2.5 POINTS)

Let X be a random variable following a Poisson distribution with mean equal to 3.6.

1. **(0.75 points)** What is the probability that X takes on values not larger than 3?

2. **(0.75 points)** What is the most likely value for the random variable X?

3. **(1 point)** Let us define the random variable $Z = X_1 + \ldots + X_{10}$, where $X_1, \ldots, X_{10}$, are independent and identically distributed random, variables having a Poisson distribution with mean equal to 3.6. What is the approximate probability that Z is exactly equal to 45?

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 write, the names of the students in your group that have actively participated in this seminar activity.