Pro 5859 - 2021 - To refresh the memory

1 - Find practical situations which could be modeled with the next probability distribution functions: A - Bernoulli, B - Binomial, C - Poisson, D - Geometric, E - Exponential, F - Normal.

2 - Which are the parameters the distributions of question 1? And their means and variances? How were they obtained? Explain

3 - Use the commands from the freeware R to get the probabilities:

X - Poisson ($\lambda = 0.3$) $- P(X > 3)$ X - Binomial (n=10, p=0.1) - $P(X < 3)$ X - Exponential ($\lambda = 0.5$) $- P(0.5 < X < 3.5)$ X - Geometric (p=0.01)- $P(X > 3)$ X - Normal ($\mu = 3, \sigma = 2)p(1.5 < X < 4)$

4 - If the parameters of distributions of question 1 are unknown, provide estimators for them.

5 - Announce the Central Limit Theorem? How useful is this theorem?

6- Consider $\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$, the sample average. Is it a random variable? Yes or no Is it possible to get exact/approximate distributions of $\bar{X}$ for the distributions listed in question 1?

7 - Do you know the difference between estimation and estimator?

8 - Which estimation methods do you know? ( ) Methods of moments ( ) Maximum likelihood ( ) Least square ( ) Bayesian Methods

9 - Which are the desired features of a good estimator of a parameter?

10 - Get the maximum likelihood estimators of the distributions of question 1.