**Theory which you have to know by heart**

1. Relation between Random Variable, Its Distribution and Probability

2. Random Vector, Covariation and Correlation

3. Assumptions and Statement of Central Limit Theorem (CLT)

4. Random process and Its stationarity

5. The essence of Markov-Chain. Kolmogorov-Chapman equation

6. Poisson process. Relation between Poisson, exponential and gamma-distribution.

7. Markov Chain with continuous time. Birth and Death process with and example

8. Brownian motion and normal distribution

9. Statistic as estimator. Mean Square Error (MSE). Maximum Likelihood Estimation (MLE). Interval Estimation

10. Statistical Tests. How to interpret probability $p$-value?

11. General Linear Model (GLM). Least Square Estimation (MLE)

12. Differences between classical and non-parametric Statistics

13. Essence of Bayesian Inference. Prior distribution, Likelihood and Posterior distribution