Exam Questions
Probability Theory (MMNKEN61)
2024./25. Semester II

1. Random variable, distribution function, expected value and their properties, transformation theorem, density theorem.

2. Independence, Borel-Cantelli lemma, Kolmogorov's 0-1 law.

3. Characteristic functions and their properties.

4. Continuity theorem. Notable distributions: characteristic functions, approximation in distribution.

5. Multidimensional normal distribution.

6. Convergence of random vectors and their properties: almost sure, stochastic and L_p convergences.

7. Convergence in distribution and mapping theorems.

8. Uniform integrability and weak law of large numbers.

9. Strong law of large numbers.

10. Central limit theorems.

11. Counting process, renewal process, renewal function and their properties.

12. Elementary renewal theorem. Renewal reward process.

13. Renewal equation, existence and uniqueness of its solutions.

14. Key renewal theorem, Blackwell's renewal theorem.