

CONTENT

CONTENT	3
1. COMBINATORICS	6
1.1. THE MULTIPLICATION COUNTING PRINCIPLE.....	6
1.2. VARIATION, PERMUTATION AND COMBINATION	6
2. RANDOM EVENTS	8
2.1. BASIC TERMS	8
2.2. OPERATIONS WITH RANDOM EVENTS	9
3. PROBABILITY	11
3.1. AXIOMATIC THEOREM OF PROBABILITY	11
3.2. PROPERTIES OF PROBABILITY	11
3.3. THE CLASSICAL PROBABILITY THEOREM.....	13
3.4. THE GEOMETRICAL PROBABILITY THEOREM	14
3.5. THE STATISTICAL PROBABILITY THEOREM.....	14
4. CONDITIONAL PROBABILITY	15
4.1. CONDITIONAL PROBABILITY THEOREM	15
4.2. INDEPENDENCE OF RANDOM EVENTS	16
4.3. TOTAL PROBABILITY FORMULA AND BAYES' FORMULA.....	18
5. REPEATED EXPERIMENTS	19
5.1. BERNOULLI'S INDEPENDENT REPEATED EXPERIMENTS.....	19
5.2. GENERALIZED INDEPENDENT REPEATED EXPERIMENTS.....	20
5.3. DEPENDENT EXPERIMENTS	20
6. RANDOM VARIABLE	21
6.1. RANDOM VARIABLE AND ITS DISTRIBUTION.....	21
6.2. RANDOM VARIABLE OF DISCRETE TYPE.....	24
6.3. RANDOM VARIABLE OF CONTINUOUS TYPE.....	25
7. SOME IMPORTANT TYPES OF DISTRIBUTION	27
7.1. DISTRIBUTION OF DISCRETE RANDOM VARIABLES	27
7.1.1. Alternative distribution.....	27
7.1.2. Geometrical distribution	27
7.1.3. Binomial distribution	28
7.1.4. Hypergeometric distribution	28
7.1.5. Poisson distribution.....	29
7.2. DISTRIBUTION OF CONTINUOUS RANDOM VARIABLES	30
7.2.1. Even distribution.....	31
7.2.2. Exponential distribution.....	32
7.2.3. Normal (Gaussian) distribution	33
7.2.4. χ^2 - distribution with n -degrees of freedom.....	37
7.2.5. Student's t -distribution	39

7.2.6. <i>F</i> - distribution (Fisher-Snedecor)	40
7.2.7. Erlang distribution	40
7.2.8. Γ - distribution	42
7.2.9. Beta distribution.....	42
7.2.10. Weibull distribution	43
7.2.11. Rayleigh distribution.....	44
8. MULTIDIMENSIONAL RANDOM VARIABLE.....	45
8.1. TWO-DIMENSIONAL RANDOM VARIABLE AND ITS DISTRIBUTION FUNCTION	45
8.2. INDEPENDENCE OF RANDOM VARIABLES	48
8.3. TWO-DIMENSIONAL RANDOM VARIABLE OF DISCRETE TYPE	49
8.4. TWO-DIMENSIONAL RANDOM VARIABLE OF CONTINUOUS TYPE.....	49
8.5. CONDITIONAL DISTRIBUTION.....	51
9. FUNCTIONS OF RANDOM VARIABLES.....	54
9.1. FUNCTIONS OF ONE-DIMENSIONAL RANDOM VARIABLES	54
9.2. FUNCTION OF TWO-DIMENSIONAL RANDOM VARIABLES.....	56
10. CHARACTERISTICS OF RANDOM VARIABLES.....	58
10.1. GENERAL MOMENTS	58
10.2. INITIAL MOMENTS.....	59
10.3. CENTRAL MOMENTS	60
10.4. MOMENTS OF TWO-DIMENSIONAL RANDOM VARIABLE	62
10.5. CHARACTERISTICS OF LOCATION	62
10.6. CHARACTERISTICS OF VARIABILITY	64
10.7. QUANTILES	64
10.8. CHARACTERISTICS OF SKEWNESS AND KURTOSIS	65
10.9. EXPECTED VALUE OF RANDOM VARIABLE.....	67
10.9.1. Properties of expected value	68
10.10. VARIANCE OF RANDOM VARIABLE.....	70
10.10.1. Properties of variance	71
10.11. COVARIANCE OF RANDOM VARIABLES.....	72
10.12. CORRELATION COEFFICIENT	74
10.13. CONDITIONAL EXPECTED VALUE AND VARIANCE	77
11. REGRESSION	79
11.1. STOCHASTIC DEPENDENCE	79
11.2. LINEAR REGRESSION FUNCTION AND CORRELATION COEFFICIENT	80
12. LIMIT FORMULAS.....	82
12.1. CHEBYSHEV'S INEQUALITY	82
12.2. CONVERGENCE ACCORDING TO PROBABILITY.....	83
12.3. LAW OF LARGE NUMBERS	84
12.4. CENTRAL LIMIT FORMULA	86
13. LITERATURE	89