

## Zachet

### Examination card 1

1. (5 points) Definite, impossible, random events, examples.
2. (5 points) what deals the correlation analysis? What does it show?
3. (5 points) The frequency of positive Rh factor is 0.8. What is the probability that any person taken randomly will have negative Rh factor?
4. (10 points) The frequency of the blood group 00 is 0.3, the frequency of the blood group AB is 0.1. Find the probability that three random patients will have the blood group 00.
5. (10 points) There are 5 different available antibiotics, 5 different probiotics. The treatment should include simultaneously 1 antibiotic (any of 5) and 1 probiotic (any of 5). How many treatment options can be made?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 15, 11, 14, 13, 15.

### Examination card 2

1. (5 points) What is a full group of events?
2. (5 points) What deals the regression analysis? What allows regression analysis?
3. (5 points) There are 6 balls in the box: 3 red, 2 blue and 1 white. What is a probability to take the blue ball.
4. (10 points) There are 5 children in family. What is the probability that all three are boys?
5. (10 points) The frequency of the blood group 00 is 0.3, the frequency of the blood group A0 is 0.35. Find the probability that random patient will have the blood groups either 00 or A0.
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 5, 6, 6, 5, 9

### Examination card 3

1. (5 points) What is the sum of events?
2. (5 points) What is the probability distribution function of a discrete random variable? Example.
3. (5 points) When entering a pin-code, one numeral is forgotten and was chosen by chance. Find the probability that the right code is entered.
4. (10 points) The frequency of the blood group 00 is 0.3, the frequency of the blood group AB is 0.1. Find the probability that three random patients will have the blood group either A0 or B0.
5. (10 points) There are 5 different available antibiotics. The treatment should include 2 antibiotics (any). How many treatment options can be made?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 15, 16, 14, 15, 18

#### **Examination card 4**

1. (5 points) What is a multiplication of events?
2. (5 points) What is the probability distribution function of a continuous random variable?  
Example.
3. (5 points) The mistake probability in the experiment is 30%. What is the probability that the experiment is correct?
4. (10 points) There are 2 children in family. What is the probability that one is boy, second is girl?
5. (10 points) The frequency of positive Rh factor is 0.8, the frequency of fourth blood group (AB) is 0.1. What is the probability that a person has a fourth blood group (AB) and a negative Rh?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 13, 11, 14, 13, 12.

#### **Examination card 5**

1. (5 points) What is variance? What does it shows?
2. (5 points) What is the normal (Gaussian) distribution? What tests can check the normal distribution?
3. (5 points) The probability of the rain is 0.6. Find the probability that the day will be sunny.
4. (10 points) The probability of the rain is 0.6. Find the probability that in 2 days one day will be sunny and another one will be rainy.
5. (10 points) The frequency of positive Rh factor is 0.8, the frequency of second blood group (A0) is 0.3. What is the probability that a person has a second blood group and a negative Rh?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 15, 13,16, 15, 14.

#### **Examination card 6**

1. (5 points) What is the significance level?
2. (5 points) What shows the Poisson distribution?
3. (5 points) The mistake probability in the experiment is 5%. What is the probability that the experiment is correct?
4. (10 points) There are five children in the family. What is the probability that only one is a girl and four are boys?
5. (10 points) The probability of the rain is 0.7. Find probability that three days will be sunny.
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 18, 17, 20, 23, 19

### Examination card 7

1. (5 points) What is the level of significance?
2. (5 points) What is the median and when is it used?
3. (5 points) The Clock is suddenly stopped. What is the probability that the minute hand will show exactly 12?
4. (10 points) There are 4 different bus routes going to destination. What is the probability to catch three times the 1<sup>st</sup> route?
5. (10 points) The probability of increased sensitivity to the drug is 0.1. What is the probability that at least one of the three patients will be with increased sensitivity?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 22, 25, 21, 24, 24

### Examination card 8

1. (5 points) What is the standard deviation?
2. (5 points) What statistical criteria can be used to compare the averages of the two samples?
3. (5 points) The probability of the train delay is 0.1. What is the probability that the train will come in time?
4. (10 points) The probability of the given disease is 0.7. 10 patients visit a Doctor. Find the probability that all 10 persons will have a disease.
5. (10 points) There are five children in the family. What is the probability that four are boys.
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 15, 13, 14, 13, 10

### Examination card 9

1. (5 points) What is the General population?
2. (5 points) What approaches for formation of a representative sample set do you know?
3. (5 points) The frequency of disease is 0.05. What is the probability that patients has no this disease?
4. (10 points) The frequency of positive Rh factor is 0.8. What is the probability that 5 randomly taken persons will have a negative Rh?
5. (10 points) There are 5 white and 5 black balls in the box. From the box, 3 balls were sequentially extracted one by one. What is the probability that all the balls will be black?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 15, 13, 14, 15, 19

### Examination card 10

1. (5 points) What is a Frequency histogram?
2. (5 points) What is the ANOVA test and what does it allow?
3. (5 points) The frequency of disease is 0.02. What is the probability that the person does not have this disease?
4. (10 points) The frequency of persons with negative Rh factor and second blood group (A0) is 0.016. The frequency of second blood group (A0) is 0.4 What is the frequency of negative Rh factor?
5. (10 points) There are 3 white, 2 blue and 5 black balls in the box. From the box, 3 balls were sequentially extracted one by one. What is the probability that all the balls will be white?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 25, 23, 24, 25, 29

### Examination card 11

1. (5 points) What is a Frequency polygon?
2. (5 points) what does the Chi-square test allow?
3. (5 points) The probability of winning the game is 0.2. What is the probability of losing?
4. (10 points) The probability of winning the game is 0.2. What is the probability to win in both of two attempts?
5. (10 points) There are 5 white and 5 black balls in the box. From the box 2 balls were sequentially extracted one by one. Find the probability that the first was white and the second black?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 25, 23, 24, 23, 20

### Examination card 12

1. (5 points) What is a Cumulative frequency?
2. (5 points) What is a cluster analysis? what does it allow?
3. (5 points) The frequency of negative Rh is 0.05. What is the probability that the patient will have positive Rh?
4. (10 points) The probability to win the game is 0.8. Find the probability to lose in four games.
5. (10 points) The frequency of occurrence of blood group 1 (00) is 0.5. What is the probability that two random donors will have the blood group 1 (00)?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 25, 23, 26, 25, 24.

### Examination card 13

1. (5 points) What is the confidence interval?
2. (5 points) What is the statistical hypothesis?
3. (5 points) The last numeral of the phone is forgotten. What is the probability to randomly dial the correct number?
4. (10 points) The last two numerals of the phone are forgotten. What is the probability to randomly dial the correct number?
5. (10 points) There are 10 balls in the box, 5 of them are red, 5 are white. From the box 2 balls were sequentially extracted one by one. What is the probability that all the balls were white?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 23, 21, 24, 23, 22.

### Examination card 14

1. (5 points) What is the inter quartile range?
2. (5 points) What are statistical criteria?
3. (5 points) The probability of winning the game is 0.1. What is the probability to lose the game?
4. (10 points) There are 2 children in family. What is the probability that both are girls?
5. (10 points) The probability of winning the game is 0.1. What is the probability to win at least once in three games?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 24, 22, 25, 24, 23.

### Examination card 15

1. (5 points) What tests for multiple comparison can be applied?
2. (5 points) What does the correlation analysis allow?
3. (5 points) One numeral of the pin-code was forgotten and was chosen randomly. What is the probability that the pin-code is correct?
4. (10 points) The probability of hitting the target in first shoot is  $p$ , in the second - 0.7. The probability to hit the target in both shoots is 0.56. Find  $p$ .
5. (10 points) There are 4 white and 6 black balls in the box. From this box 3 balls were sequentially extracted one by one. What is the probability that all the balls will be black?
6. (15 points) Calculate statistical characteristics (Average, variance, standard deviation) for the data: 26, 24, 27, 26, 25.