Each task is worth 0.5 points. You can score a total of 10 points.

1. There are 50 students on the course who study German or French or do not study either language. There are also students who do not study any language and study two languages at once. It is known that 25 students study French, 20 study German, 5 students study both languages. Determine the number of students who study:
   - French only
   - do not learn German
   - learn French or German
   - do not learn any language
2. There are 12 married couples at the party. Find the number of ways to choose 1 man and 1 woman so that they are not married.
3. Determine the number of ways in which 9 toys can be divided among 4 children, if all children need to be given 2 toys, and the youngest - 3.
4. Determine the number of different signals, each of which consists of 6 vertically arranged flags, which can be made up of 4 identical red flags and 2 identical blue flags.
5. There are 12 students in the group, including 8 excellent students. 9 students were randomly selected from the list. Find the probability that there are five excellent students among the selected students.
6. There are 10 details in a box, four of which are painted. The man randomly took three details. Find the probability that at least one of the selected parts is colored.
7. There are 10 balls in a box, 4 of which are colored. The boy took 3 balls at random. Find the probability that at least one of the balls taken is colored.
8. The box contains 12 details made in factory 1, 20 details — in factory 2 and 18 details — in factory 3. The probability that a detail manufactured at factory 1, has an excellent quality, equal to 0.9; for details manufactured at factories 2 and 3, these probabilities are respectively 0.6 and 0.9. Find the probability that a randomly selected detail will be excellent quality.
9. Research by psychologists has established that men and women react differently to some life circumstances. The results of the research showed that 70% of women react positively to these situations, while 40% of men react negatively to them. 15 women and 5 men filled out a questionnaire in which they reflected their attitude to the proposed situations.
   - determine the probability that a randomly selected questionnaire contains a positive reaction.
   - a randomly extracted questionnaire contains a negative reaction. What is the probability that it was filled out by a man?
10. The coin is tossed 4 times. Find the probability that the “head" will fall:
    - less than 3 times;

- at least twice.

11. The car insurance company divides drivers into three classes: class A (low risk), class B (medium risk), class C (high risk). The company assumes that of all drivers insured by it, 30% are class A, 50% are class B, 20% are class C. The probability that a class A driver will have at least one car accident during the year is 0, 01; for a class B driver this probability is 0.03, and for a class C driver it is 0.1. Mr. Jones insures his car with this company and gets into a car accident within a year. What is the probability that it belongs to class A?
12. Four customers arrived at the warehouse. The probability that each of these customers will need a refrigerator is 0.4. Find the probability that a refrigerator will be needed by: a) at least two customers; b) at most three customers; c) all four customers.
13. Statistics from company audits state that the probability of detecting an error in each document being audited is 0.1. What is the probability that out of ten documents being audited, nine of them will be error-free?
14. A student will receive a pass if he answers 30 or more questions out of 50 correctly. What is the probability of receiving a pass if a student simply answers “true” – “false” at random?
15. The probability of failure of one machine is 0.12. Determine the probability of failure of 4 to 10 machines if there are 155 machines.
16. To pass the exam successfully, you must answer at least one of the two proposed theoretical questions and solve the problem. The probability that a student will answer the theoretical question correctly is 0.7, and solve the problem is 0.8. Find the probability that a student will pass the exam.
17. A woman has 15 pairs of shoes, 5 of which are red. A woman takes 3 pairs of shoes at random. Find the probability that at least one pair is red.
18. The TV studio has 7 televisions. For each TV, the probability that it is currently on is 0.6. Find the probability that the following are currently on: a) four televisions; b) at least one TV; c) at least three televisions.
19. Calculator manufacturers know from experience that 1% of calculators sold are defective. An audit firm bought 500 calculators. What is the probability that 4 calculators will have to be replaced? No more than 20 calculators?
20. The test on the subject consists of six problems, and the test is considered passed if the student has solved at least four of them. The student can solve each problem with a probability of 0.6. What is the probability that he will pass the test?