The set of questions for the Bachelor's Degree in Informatics (residential, first cycle programme)

Questions about basic issues

1. Relational data model. Relations. Primary keys and foreign keys.
2. The concept of the algorithm, way of presenting. Examples of algorithms.
3. TCP / IP model. Characteristics of individual layers of the model.
4. Expressions, operators and their priorities. Assignment, iteration, switch and selection instructions.
5. One-dimensional and multidimensional arrays.
6. Syntax and application of the function, returning the result by the function, sending arguments to the function.
7. Recursive functions. The use of recursion in sorting algorithms.
8. Basic sorting and searching algorithms.
9. Characterize the HTML language, explain the function of CSS and JavaScript in creating websites.
10. Features of object-oriented programming.

Questions about specific issues

1. Artificial neural networks. Supervised and unsupervised learning algorithms.
2. Diagram of UML classes.
3. Agile methodologies for software development.
4. Discrete random variable and its expected value.
5. List and discuss the properties of basic statistical measures used in descriptive statistics.
6. Floating representation of real numbers.
7. Character coding standards.
8. Stack, queue, list, tree. Give examples of applications.
9. Binary trees and their traverse.
10. Polynomial interpolation - posed problem.
11. Gauss elimination.
12. Inheritance.
13. Polymorphism.
14. Interfaces. Interface implementation by the class. Examples of applications.
15. Multithreaded programming.
16. Basic constructions of the SQL language.

17. Public key infrastructure. Certificates.
18. Transactions and their properties.
19. Database security.
20. Time and memory complexity classes of algorithms.
21. Approximation. Least squares method.
22. Addressing in IPv4 and IPv6 protocols.
23. List and characterize any three network protocols.
24. Basic concepts and standards in IT project management.
25. What does the responsiveness of a website mean? Provide application and examples of using media queries.
26. Use of CSS language for positioning elements on the page (give some examples).
27. Scalar product and vector product of vectors in space. Definitions and properties.
28. Describe the general principle of "divide and conquer" algorithms.
29. Methods for solving various systems of linear equations.
30. Symmetrical and asymmetrical cryptography. Examples of algorithms.
31. Describe Newton's method of roughly determining the zero points of the real function.
32. Cascading process of software development.
33. Abstract classes.
34. Exceptions. Defining and handling.
35. Breadth-first search and depth-first search for traversing graph.
36. Information storage in the computer, data representation, number coding.
37. Describe the DOM (Document Object Model) HTML and how to manipulate it using JavaScript.
38. Integrity rules in the relational model.
39. Characterize the selected dynamic routing protocol.
40. Dynamic programming.