

Final Control Questions for the Discipline "Software System Design"

1. Explain the concept of abstraction in software systems design.
2. Define the Abstract Factory design pattern and its main characteristics.
3. Explain Agile SDP (Software Development Process) methodology as a modern flexible technology.
4. Analyze software design patterns and their areas of practical application.
5. Provide characteristics of architectural patterns and explain their applicability in different contexts.
6. Explain the concept of the bridging pattern and list its main application areas.
7. Explain the Singleton design pattern and analyze its practical usage.
8. Describe the Command design pattern and analyze its areas of application.
9. Explain the importance of evaluating software projects and the main challenges encountered.
10. Define software design and its role in the software lifecycle.
11. Explain the concept of decomposition and list its main types.
12. Characterize the "Board" pattern and clarify its applicability.
13. Explain the Leader-Follower pattern and its areas of application.
14. Describe the Factory Method design pattern and its application.
15. Explain the user interaction pattern and its practical use.
16. Analyze functional and structural decomposition.
17. Explain known hybrid design approaches and their applicability.
18. Provide a description of state diagrams and their areas of application.
19. Describe the concept of hierarchy diagrams and their use in design practice.
20. Explain the incremental development model (Incremental SDP) and its advantages.
21. Explain the Interpreter design pattern and its application areas.
22. Explain exception handling and safe configuration in software.
23. Provide a description of process-oriented design and its areas of application.
24. Explain the "Pipes and Filters" architectural pattern and its practical applicability.
25. Explain the concept of the Bridge design pattern and its usage.
26. Provide an overview of design models, their advantages, and disadvantages.
27. Describe design patterns and their areas of application.
28. Explain the Chain of Responsibility design pattern and its practical use.
29. Explain the Client-Server design pattern and its applicability.
30. Discuss the Model-View-Controller (MVC) design pattern and its areas of application.
31. Analyze modular and functional decomposition.
32. Explain the Nassi-Shneiderman diagram and provide an example of its usage.
33. Which activities in software development are not part of the design phase?
34. Explain the object-oriented approach to design and its practical applications.
35. Describe the bottom-up approach to design and its applicability.
36. Explain the Layered design pattern and its usage.
37. Describe the Waterfall development model (Waterfall SDP) and its advantages.
38. Explain the concept of class diagrams (OOP) and their application.
39. Characterize structural patterns and their areas of application.
40. Explain structural-functional decomposition and its use cases.
41. Describe visual modeling tools and their goals.
42. Explain the Event-driven pattern and its usage.
43. Explain the Mediator design pattern and its practical applications.
44. Analyze behavioral patterns and their areas of application.
45. Provide characteristics of creational patterns and their usage.
46. Describe the top-down approach to design.

47. Explain data modeling: logical and physical data models.
48. Describe the general process of software design.
49. What component-level design principles do you know?
50. What metrics are used to evaluate software projects?
51. What key aspects should be considered when creating an ER diagram?
52. Describe the Wasserman method in design.
53. Explain Scrum as an agile software development methodology.
54. Explain the Kanban methodology.
55. What are the main causes of software failures?
56. List the sources of errors in the software development process.
57. Explain security aspects during the software design phase.
58. What do you know about the EDISON methodology?
59. Define data modeling and describe its objectives.
60. Explain the Entity-Relationship (ERD) diagram in UML.
61. What are the main goals of behavioral models?
62. Explain the importance of the domain and provide its definition.
63. In which areas can visual modeling be applied?
64. List the models describing the structure of design.
65. What is meant by designing models that describe behavior?
66. What should be considered when ensuring the security of software system design?
67. What do you know about the fundamentals of ERD?
68. How is a feasibility study conducted?
69. Explain the concept of use case diagrams.
70. What does it mean to study information security from a developer's perspective?
71. What is static code analysis (Static Code Analysis)?
72. What empirical methods exist for evaluating software performance?
73. Explain the concept of software metrics and their types.
74. List the types of metrics and their areas of application.
75. Describe the classification of evaluation methods.
76. How is the complexity of software development evaluated?
77. Describe the quality attributes of solving design tasks.
78. What do you know about design patterns?
79. Explain the Iterator design pattern.
80. Explain the Memento design pattern.
81. Provide a classification of design patterns.
82. Describe the structure of design patterns.
83. List the areas of application for design patterns.
84. How to evaluate the effectiveness of software system design?
85. Explain time-related performance (Performance) in software systems.
86. What is meant by algorithm efficiency?
87. Analyze the efficiency of data structures.
88. Explain security aspects in software system design.
89. What are the criteria and models for designing programs?
90. Explain the concept of user interfaces (human-computer interaction).
91. Develop an activity diagram for the design of an ATM system.
92. Create an activity diagram for the design of a library system.
93. Develop a class diagram for an ATM system.
94. Create a class diagram for a library system.
95. Develop a state diagram for an ATM system.
96. Create a state diagram for a library system.

97. What algorithms can be used in the development of a library software system?
98. Develop an ER diagram for an ATM system.
99. Create an ER diagram for a library system.
100. What algorithms can be used in the development of software for online courses?