

Final Examination Question Bank on Computer Architecture (2024)

1. Explain the evolution of computer generations and the technological characteristics of each generation.
2. What are the main differences between the technological generations of computers?
3. How can computers be classified based on their functions and application areas? Provide explanations.
4. Explain how computers are categorized based on computational principles.
5. How are computers categorized by size and computational power?
6. What are the main features and application areas of mainframe computers?
7. Provide information about minicomputers and give examples.
8. Provide information about microcomputers and give examples.
9. What technological changes have played an important role in the evolution of microprocessors?
10. Provide information about personal computers and give examples.
11. List the main components of a computer and explain their functions.
12. What are the technical specifications of a computer?
13. What is a microprocessor, and what are its main functions?
14. Explain the key functions of a microprocessor.
15. Describe the technical specifications of microprocessors.
16. Enumerate the types of computer memory and explain their functions, technical specifications, and differences.
17. Provide information about external memory, its functions, differences, and technical specifications.
18. Provide information about RAM (operational memory) and its structure.
19. What is the function of RAM?
20. What are the main technical differences between RAM and cache memory?
21. What are the differences between von Neumann architecture and post-von Neumann models in computer architecture?
22. Define the concept of computer architecture.
23. Define the concept of processor architecture and explain its main components.
24. Provide information about virtual memory.
25. What are the advantages and disadvantages of shared memory and distributed memory systems?
26. How is data exchange organized in distributed memory systems?
27. Explain the main principles, advantages, and disadvantages of RISC architecture.
28. Provide information about CISC architecture and discuss its advantages and disadvantages.
29. Compare the similarities and differences between RISC and CISC architectures.
30. Describe the main characteristics of VLIW architecture and its advantages and disadvantages.
31. Explain the memory hierarchy in computer systems.
32. What is the primary function of cache memory?
33. How do shared memory computer systems work, and what are their key features?
34. How do distributed memory computer systems work, and what are their key features?
35. Explain the organization and advantages of multiprocessor systems.
36. Provide information about the interconnection topologies of computing systems.
37. How are parallel computing systems classified based on Flynn's taxonomy?
38. What criteria form the basis of Flynn's taxonomy?
39. What are the main features of Flynn's taxonomy?
40. What is SISD (Single Instruction, Single Data)? Explain with examples.
41. What is MISD (Multiple Instruction, Single Data)? Explain with examples.

42. What is SIMD (Single Instruction, Multiple Data)? Explain with examples.
43. What is MIMD (Multiple Instruction, Multiple Data)? Explain with examples.
44. Explain the structure and working principles of the central processing unit (CPU).
45. What are the similarities and differences between SIMD and MIMD architectures?
46. Compare the advantages and disadvantages of CISC and RISC processors.
47. Define the concept of processor architecture.
48. How are instructions executed in a processor?
49. Explain the stages of the instruction execution cycle in a processor.
50. How is computer software classified, and what are its main functions?
51. Provide definitions of parallel computing systems.
52. Explain the concept of parallelism.
53. Discuss the application areas of parallel computing systems.
54. List and describe the types and methods of parallel computing systems.
55. How are the levels of parallelism classified?
56. How is instruction-level parallelism achieved?
57. Explain the machine instruction cycle (execution cycle).
58. Provide a detailed explanation of pipelined processing.
59. Explain superscalar processing (with diagrams and schematic representation).
60. What are the differences between cluster computing systems and supercomputers?
61. Explain the architecture and application areas of distributed systems.
62. Explain parallel computing.
63. What are the main types of supercomputers, and what are their advantages?
64. Explain the structure and operation principles of cluster computing systems.
65. How does Amdahl's Law work, and what is its mathematical interpretation?
66. Explain Gustafson's Law.
67. Describe effective methods for achieving parallelism.
68. Provide information about multicore processors.
69. Explain the architecture of multicore processors and their application areas.
70. Discuss the functions and application areas of graphics processors (GPUs).
71. What tasks are performed by GPUs?
72. Provide examples of multicore processors, their manufacturers, models, and technical specifications.
73. Provide information about the architecture of streaming processors (SM).
74. List the types of supercomputers and provide details about them.
75. Provide the technical specifications of the Frontier supercomputer.
76. Provide the technical specifications of the Aurora supercomputer.
77. Provide the technical specifications of the Fugaku supercomputer.
78. Provide the technical specifications of the Alps supercomputer.
79. Provide the technical specifications of the Leonardo supercomputer.
80. Explain the main functions of the OpenMP software package.
81. How is parallelization achieved using the OpenMP package?
82. What tasks are performed by the OpenMP software package?
83. How are parallel computing algorithms optimized using CUDA technology?
84. What are the main differences between OpenMP and CUDA technologies?
85. Explain the application areas of the MPI software package.
86. What are the objectives of MPI technology?
87. How is data processed in GPUs? Explain the steps.
88. List the types of multiprocessor computing systems and provide information about them.
89. Explain the architecture of vector-pipeline computers and their working principles.
90. Provide information about symmetric multiprocessing (SMP).
91. Provide information about asymmetric multiprocessing (AMP).
92. Discuss the advantages and disadvantages of Intel processors.

93. Discuss the advantages and disadvantages of AMD processors.
94. What metrics are used to evaluate the performance of computing systems?
95. What opportunities are created for future computing systems by GPU and CPU integration?
96. Why do parallel computing systems deliver faster results?
97. How does cache memory improve the speed of a computer?
98. What benefits does virtual memory provide to a computer?
99. Why is parallel computing important when working with large data sets?
100. Discuss how Flynn's taxonomy helps classify and understand computing systems.