

Final exam questions on “Parallel computer architecture and programming”

1. Explain parallel computing systems. Elaborate on the characteristics of parallel computing systems with examples.
2. Provide information about special programming languages for parallel programming. Explain how each special language is implemented in practice with examples.
3. Provide information about task parallelism. Explain the processing operations where task parallelism is applied with examples.
4. Provide information about data parallelism. Explain the processing operations where data parallelism is applied with examples.
5. What is meant by the execution of "independent processes"? What conditions are considered when creating independent processes in parallel computing?
6. What programming models do you know? What is meant by the degree of consistency in parallel computing processes when using programming models? Explain with examples.
7. What architectures and technologies do you know for data parallelization? Explain existing architectures and technologies with examples.
8. Explain the issues of speed in data processing. What are the main issues in parallelizing the stages of data processing?
9. Provide information about Flynn's classification. Which classes of Flynn's classification serve as a basis for parallel computing? Explain with examples.
10. What does Moore's law explain? What issues does Moore's law address in parallel computing? Explain with examples.
11. What is Hyper-Threading technology? What parallel computing technologies are used in multi-core processors? Explain with examples.
12. How many stages are involved in generating a computation flow? Explain each stage with examples.
13. What is the significance of clustering in parallel computing? How does it differ from other computational methods and tools? Explain with examples.
14. Which parallelization technologies give the best results in cluster computing systems? Justify your answer with examples.
15. What is meant by memory organization? Explain the significance of computer memory elements in parallel computing.
16. What role does memory hierarchy play in parallel computing? Explain all parts of the hierarchy with examples.
17. What opportunities do high-level programming languages provide to the user? Justify your answer with examples related to parallel computing.
18. Explain memory hierarchy. Explain the importance of cache memory in fast data processing with examples.
19. What results does ultra-fast memory bring to the parallel computing architecture? What types of ultra-fast memory are widely used in processors to improve speed today?
20. What is the main function of cache memory? Explain the importance of cache memory in parallel computing with examples.
21. Explain the importance and characteristics of fast memory (RAM) in parallelization with examples.
22. What type of architecture is NUMA (Non-uniform Memory Access)? Explain the positive and negative features of this architecture in parallel computing.
23. What type of architecture is UMA (Uniform Memory Access)? Explain the positive and negative features of this architecture in parallel computing.

24. What type of architecture is ccNUMA (cache-coherent Non-Uniform Memory Access)? Explain the positive and negative features of this architecture in parallel computing.
25. What factors do parallel algorithm performance indicators depend on? Justify your answer with examples.
26. Explain VLIW architecture. Explain the positive and negative features of this architecture in parallel computing.
27. Explain pipeline processing. What are the important characteristics of this computational method in parallel computing? Explain with examples.
28. Explain the steps involved in superscalar processing in parallel computing with examples.
29. What are the advantages and disadvantages of the sequential computing model? Do sequential computing conditions also apply in parallel computing processes? Justify your answer with examples.
30. Explain the advantages and disadvantages of parallel models with examples.
31. What do you understand by the "acceleration potential" of processors? How is this concept applied in modern processors today?
32. What architectures and technologies are used in instruction parallelization, and what is their main task in parallelization? Explain with examples.
33. How is the degree of consistency in parallel algorithms applied to multi-core and multi-processor computing systems? Explain with examples.
34. What is the importance of local and global buses in parallel processing? How important is the role of buses when processing large amounts of data in parallel?
35. What parallel processing technologies are applied in mobile device processors? Explain with examples.
36. What is the purpose of parallel processing in graphics processors, and what are its characteristics? Explain with examples.
37. What is the significance of switching systems in parallel computing? What is the main issue in switching systems for parallel processing?
38. Explain the "process-operand" model in parallel computing with examples.
39. Provide information about Symmetric multiprocessing (SMP). Explain the advantages of this technology in parallel computing with examples.
40. Provide information about Asymmetric multiprocessing (AMP). Explain the advantages of this technology in parallel computing with examples.
41. What are the main disadvantages of the Asymmetric multiprocessing (AMP) system? Explain with examples in parallel computing.
42. What are the main disadvantages of the Symmetric multiprocessing (SMP) system? Explain with examples in parallel computing.
43. Explain the advantages and disadvantages of shared memory computing systems. Justify your answer with examples from parallel computing.
44. What is the significance of power efficiency in processor performance? Justify your answer with examples from parallel computing.
45. Provide information about the advantages and disadvantages of Intel processors. Justify your answer with examples from parallel computing.
46. Provide information about the advantages and disadvantages of AMD processors. Justify your answer with examples from parallel computing.
47. What do you understand by heterogeneous computing systems? Justify your answer with examples from parallel computing.
48. Explain the conditions for implementing parallelization and justify them with examples.
49. Provide examples of solving problems in parallel computing. Justify your answer with examples of fast data processing.

50. Explain the multitasking method. Justify your answer with examples from parallel computing.
51. What is SISD (Single Instruction, Single Data)? Explain with examples in parallel computing.
52. What is MISD (Multiple Instruction, Single Data)? Explain with examples in parallel computing.
53. What is SIMD (Single Instruction, Multiple Data)? Explain with examples in parallel computing.
54. What is MIMD (Multiple Instruction, Multiple Data)? Explain with examples in parallel computing.
55. Explain the areas of application of MIMD architecture. Justify your answer with examples from parallel computing.
56. What SIMD-based technologies do you know for parallel processing of graphic data? Justify your answer with examples from parallel computing.
57. Explain the CUDA technology developed by Nvidia with diagrams. Justify your answer with examples from parallel computing.
58. Explain the heterogeneous computing architecture in graphics processors with diagrams. Justify your answer with examples from parallel computing.
59. Explain the GPU memory structure using the CUDA programming model with diagrams. Justify your answer with examples from parallel computing.
60. Explain the GPU memory structure using the OpenCL programming model with diagrams. Justify your answer with examples from parallel computing.
61. What is the goal of OpenMP technology? Justify your answer with examples from parallel computing.
62. What is the goal of TBB (Threading Building Blocks) technology? Justify your answer with examples from parallel computing.
63. How many stages are involved in generating a flow? Justify your answer with examples from parallel computing.
64. What is the flow execution period? Justify your answer with examples from parallel computing.
65. Provide information about MPI technology and explain it with diagrams. Justify your answer with examples from parallel computing.
66. Explain parallel processing in general memory computing machines with examples.
67. Explain parallel processing in distributed memory computing machines with examples.
68. How is memory management handled in distributed memory computing machines? Explain with examples.
69. Explain the difference between parallel and distributed computing models with examples.
70. How is parallelization mainly implemented in distributed computing? Justify your answer with examples.
71. Explain the process of cache memory operation and its importance in parallelization with examples.
72. What needs to be done to increase the time for data processing in fast memory? Justify your answer with examples from parallel computing.
73. How are operations performed in NUMA (Non-uniform Memory Access) architecture? Justify your answer with examples from parallel computing.
74. How are operations performed in ccNUMA (cache-coherent Non-Uniform Memory Access) architecture? Justify your answer with examples from parallel computing.
75. How can issues with fast memory and permanent memory be solved in fast data processing? Justify your answer with examples.
76. What is the significance of pipeline processing in parallel computation?

77. What important stages should be considered when forming instructions in VLIW architecture in parallel processing? Justify your answer with examples.
78. What important stages should be considered when forming instructions in superscalar processing in parallel computing? Justify your answer with examples.
79. What does Amdahl's law explain? Justify your answer with examples in parallel computing.
80. What does Gustafson's law explain? Justify your answer with examples in parallel computing.
81. Why can't hardware and software be developed separately in parallel computing systems? Justify your answer with examples.
82. What opportunities does the C++ programming language provide in parallel computing? Justify your answer with examples from parallel computing.
83. What opportunities does the Autocode programming language provide in parallel computing? Justify your answer with examples from parallel computing.
84. What opportunities does the Mnemonic code programming language provide in parallel computing? Justify your answer with examples from parallel computing.
85. What is the importance of the compiler in parallel algorithm-based programs? Justify your answer with examples.
86. Explain the characteristics of metacomputers in parallel computing.
87. How is FLOPS (FLoating-point OPerations per Second) used to evaluate computing machine performance in parallel computing?
88. How is MIPS (Million Instructions Per Second) used to evaluate computing machine performance in parallel computing?
89. What is the importance of graphic games in evaluating processor performance? Justify your answer with examples from parallel computing.
90. Provide information about vector-pipeline architecture. Justify your answer with examples from parallel computing.
91. Provide information about Grid technology. Justify your answer with examples from parallel computing.
92. Explain the stages of creating parallel algorithms. Provide important concepts related to each stage.
93. Provide information about modern supercomputers and their application areas. Justify your answer with examples from parallel computing.
94. Explain the important characteristics of hardware in parallel computing systems with examples.
95. What opportunities does the C++ programming language provide in parallel computing? Provide examples.
96. What problems can arise when applying the MPI (Message Passing Interface) technology in algorithms developed based on parallel computing?
97. What problems can arise when applying the TBB (Intel Threading Building Blocks) technology in algorithms developed based on parallel computing?
98. What problems can arise when applying the CUDA (Compute Unified Device Architecture) technology in algorithms developed based on parallel computing?
99. What problems can arise when applying the OpenMP technology in algorithms developed based on parallel computing?
100. Explain the significance of VLIW and Superscalar architectures in parallel processing.

Test creator

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