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What is Memory Organization ? Discuss different types of Memory
Organization in Computer System.

Memory organization refers to the way that memory is structured and managed within a computer system. Memory organization is important because it determines how data is stored and accessed, which can have a significant impact on the performance and efficiency of the system.

There are several different types of memory organization used in computer systems, including:

1. Von Neumann Architecture
2. Harvard Architecture
3. Cache Memory
4. Virtual Memory

Von Neumann Architecture:

The Von Neumann architecture is one of the most widely used memory organizations in computer systems today. It is named after the computer scientist John von Neumann, who first proposed this architecture in the 1940s. In the Von Neumann architecture, the computer's memory is divided into two parts: the data memory and the program memory. Both data and instructions are stored in the same memory and accessed through the same bus. This makes it easy for the computer to execute instructions, but it can also lead to performance bottlenecks when the CPU needs to access both data and instructions at the same time.

Harvard Architecture:

The Harvard architecture is a memory organization that separates the data memory and the program memory into two separate physical memories, which are accessed by separate

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buses. This allows the CPU to access both data and instructions simultaneously, which can improve performance. However, it also requires more hardware, which can increase the cost and complexity of the system.

Cache Memory:

Cache memory is a type of memory organization that is used to improve the performance of a computer system. Cache memory is a small amount of high-speed memory that is located close to the CPU. When the CPU needs to access data, it first checks the cache memory to see if the data is already there. If the data is in the cache memory, it can be accessed quickly, which can significantly reduce the time it takes for the CPU to access the data.

Virtual Memory:

Virtual memory is a memory organization that allows a computer system to use more memory than is physically available. This is accomplished by temporarily transferring data from the computer's main memory to disk storage. When the data is needed again, it is transferred back to the main memory. Virtual memory allows programs to run even if the computer does not have enough physical memory to accommodate all of the data and instructions that the program requires.

In summary, memory organization is an important aspect of computer systems, and there are several different types of memory organization that can be used to optimize performance and efficiency. The choice of memory organization depends on the specific requirements of the system, including the type of applications it will run and the available hardware resources.

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26. Write short note on improving cache performance methods in detail ?

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27. What is Multiprocessor ? Explain inter process communication in detail ?

28. Briefly explain the concept of pipelining in detail ?

29. Discuss the following in detail: RISC architecture, Vector processing ?

30. Define the instruction format ? Explain I/O System in detail ?

31. Explain the design of arithmetic and logic unit by taking on example ?

32. Explain how addition and subtraction are performed in fixed point number ?

33. Explain different modes of data transfer between the central computer and I/O device ?

34. Differentiate between Serial and parallel data transfer ?

35. Explain signed magnitude, signed l's complement and signed 2's complement representation of numbers. Find the range of numbers in all three representations for 8 bit register.

36. If cache access time is lOOns, main memory access time is 1000 ns and the hit ratio is 0.9. Find the average access time and also define hit ratio.

37. Explain hardwired microprogrammed control unit ? What is address sequencer circuit ?

38. Explain how a stack organized computer executes instructions? What is Stack?

39. Draw and explain the memory hierarchy in a digital computer. What are advantages of cache memory over main memory?

40. What is Associative memory? Explain the concept of address space and memory space in Virtual memory.

41. What is Paging? Explain how paging can be implemented in CPU to access virtual memory.

42. Explain SIMD array processor along with its architectural diagram ?

43. Write short notes on

44. Draw the functional and structural views of a computer system and explain in detail ?

45. Explain general register organization.

46. Compare and contrast DMA and I/O processors ?

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47. Define the following: a) Flynn's taxonomy b) Replacement algorithm
48. Explain the various pipeline vector processing methods ?
49. Describe the language features for parallelism ?
50. What are different addressing modes? Explain them.
51. Explain any page replacement algorithm with the help of example ?
52. What is mapping? Name all the types of cache mapping and explain anyone in detail.
53. Explain arithmetic pipeline ?
54. Write short notes on, a) SIMD, b) Matrix multiplication c) Instruction format
55. Differentiate: a) Maskable and non-maskable interrupt b) RISC and CISC
56. Computer Organization Previous Years Solved Questions
57. Booths algorithm to muliyiply +5 and -15