a) SIMD

SIMD stands for “Single Instruction Multiple Data”. It is a type of parallel processing technique that allows multiple data elements to be processed simultaneously using a single instruction. SIMD instructions are commonly used in multimedia applications such as video encoding, audio processing, and image processing, where the same operation needs to be performed on a large amount of data.

b) Matrix Multiplication

Matrix multiplication is a mathematical operation used in many areas of computer science and engineering, including machine learning, computer graphics, and scientific computing. It involves multiplying two matrices and producing a third matrix as the result. The operation is performed by multiplying each element in a row of the first matrix with each corresponding element in a column of the second matrix, and summing the products. The result is the element at the corresponding row and column of the resulting matrix.

c) Instruction Format

Instruction format refers to the layout and organization of the binary code that represents a computer instruction. The instruction format includes the opcode, which specifies the operation to be performed, as well as any operands or addressing modes that specify the data to be operated on. The format of an instruction can vary depending on the architecture of the processor, and can have a significant impact on the performance and efficiency of the computer. Modern processors typically use complex instruction set architectures (CISC) or reduced instruction set architectures (RISC) with different instruction formats optimized for specific types of operations.

Write short notes on, a) SIMD, b) Matrix multiplication c) Instruction format

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36. 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.
37. 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.
38. Explain hardwired microprogrammed control unit ? What is address sequencer circuit ?
39. Explain how a stack organized computer executes instructions? What is Stack?
40. Draw and explain the memory hierarchy in a digital computer. What are advantages of cache memory over main memory?
41. What is Associative memory? Explain the concept of address space and memory space in Virtual memory.
42. What is Paging? Explain how paging can be implemented in CPU to access virtual memory.
43. Explain SIMD array processor along with its architectural diagram ?
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45. Draw the functional and structural views of a computer system and explain in detail ?
46. Explain general register organization.
47. Compare and contrast DMA and I/O processors ?
48. Define the following: a) Flynn’s taxonomy b) Replacement algorithm
49. Explain the various pipeline vector processing methods ?
50. Describe the language features for parallelism ?
51. What are different addressing modes? Explain them.
52. Explain any page replacement algorithm with the help of example ?
53. What is mapping? Name all the types of cache mapping and explain anyone in detail.
54. Explain arithmetic pipeline ?
55. Differentiate: a) Maskable and non-maskable interrupt b) RISC and CISC
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