

Name: Date: **9618 FILL IN THE BLANKS: PARALLEL PROCESSING***Select the correct term from the Answer Bank box below and drag & drop it into the blank column space provided.*

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|----------------------------|----------------------------------|--------------------|--------------------|-----------------------|
| Massively Parallel | graphics processing units (GPUs) | complexity | asynchronous | pipelining |
| supercomputers | array processing | matrix mathematics | SISD | MIMD |
| distributed memory | synchronous | data dependency | Von Neumann | multi-core processors |
| interconnect network | MISD | compiler | data stream | memory sharing |
| autonomous microprocessors | fault tolerance | instruction stream | instruction stream | single processor |

| No | Question description | DROP answer here |
|----|---|------------------|
| 1 | The traditional, non-parallel computer model that processes one instruction on a single piece of data at a time is classified as a ___ architecture. | |
| 2 | The ___ model serves as the structural foundation for SISD architecture, utilizing a single control unit and one arithmetic logic unit connected to a shared memory block. | |
| 3 | The acronym "SIMD" explicitly stands for Single Instruction, Multiple _____ | |
| 4 | Architectures implementing SIMD are highly efficient at handling multimedia tasks because a single ___ can be broadcast simultaneously to many separate processing cells. | |
| 5 | Modern computer hardware architectures like ___ rely heavily on SIMD principles to rapidly alter millions of screen pixels simultaneously. | |
| 6 | A major benefit of SIMD systems is their native support for ___, allowing identical arithmetic loops to execute across large grids of values in one step. | |
| 7 | The core of SIMD architecture is inherently ___, meaning all execution nodes wait for the control unit to dispatch the next instruction before moving forward together. | |
| 8 | The rarest and most theoretically restrictive architecture in Flynn's classification scheme is ___, which passes a single data point through multiple independent operations. | |
| 9 | The primary real-world application of MISD computing centers on providing critical redundancy and ___ in mission-critical environments such as flight navigation systems. | |
| 10 | MISD systems can be effectively simulated in multi-stage hardware systems by applying different mathematical operations to a shared dataset using an advanced form of data ___. | |
| 11 | The architecture that defines true modern multi-tasking parallel processing by handling multiple independent instruction sets over diverse concurrent datasets is known as ___ | |
| 12 | Commercial consumer computer chips today operate as MIMD environments through the physical layout of ___ housed on a individual silicon die. | |
| 13 | Unlike SIMD, processing nodes within a MIMD configuration function in an entirely ___ manner, executing their own independent subroutines at varying execution ___ paces. | |
| 14 | A key structural challenge when developing a MIMD system is managing complex ___ strategies, ensuring separate cores do not corrupt or conflict over shared ___ variables. | |
| 15 | A clear drawback of SISD processors compared to any parallel processing alternative is the strict upper performance boundary imposed by its dependency on a ___ core. | |
| 16 | An advantage of a SIMD chip over a MIMD chip is reduced structural ___ because it needs only a single central instruction decoder rather than duplicating decoders on every core. | |
| 17 | A limitation of SIMD occurs when application source code cannot be easily formatted into uniform calculations, rendering its massive parallel ___ arrays completely idle. | |
| 18 | A drawback of MIMD setup is programmers must carefully write code to prevent any ___ errors, where one core stalls waiting for an output that another core hasn't produced yet. | |
| 19 | The full potential of MIMD hardware execution paths, software engineers must rely on a highly sophisticated ___ to safely partition and distribute standard high-level language oops. | |
| 20 | While highly flexible, MIMD consume more power and require intricate cooling device due to the high physical transistor count required to run full, independent ___ decoders on all. | |
| 21 | A specialized scaling architecture that links thousands of complete, individual CPU nodes together to collaborate on massive, unified computations is known as a ___ Computer. | |
| 22 | Massively parallel computers are typically utilized as high-end ___ to handle complex scientific models such as advanced weather tracking or molecular simulation. | |
| 23 | Unlike basic multi-core setups that share local RAM chips, massively parallel designs utilize a ___ framework where each individual node has its own isolated memory system. | |
| 24 | To pass data packets across these thousands of isolated processing clusters, massively parallel computers depend on a high-speed, structural physical ___. | |
| 25 | A massive bottleneck of these giant systems is the extreme software complexity involved in coordinating thousands of completely ___ simultaneously without bus traffic gridlocks. | |