WEEK 3 ASSIGNMENT

1. What is a multi-core processor.

A. A single-core processor
B. A processor with multiple execution units
C. A processor that supports multi-threading
D. A processor with more than one core integrated into a single chip

Answer: A processor with more than one core integrated into a single chip

2. What is the primary purpose of using multiple cores in a processor.

A. To increase the processor's clock speed
B. To reduce power consumption
C. To improve parallel processing capabilities
D. To enhance single-threaded performance

Answer: To improve parallel processing capabilities

3. What is a "thread" in computing.

A. A physical component of a processor
B. A single sequence of programmed instructions
C. A cache memory unit
D. A type of input/output operation

Answer: A single sequence of programmed instructions

4. What is the main purpose of cache memory in multi-core architectures.

A. To store data permanently
B. To reduce memory access time
C. To increase the number of cores
D. To manage power consumption

Answer: To reduce memory access time

5. Which of the following is a technique to improve memory access speed in multi-core processors.

A. Increasing clock speed
B. Prefetching
C. Reducing the number of cores
D. Increasing pipeline depth

Answer: Prefetching

6. What is 'NUMA' in the context of multi-core architectures.

A. Non-Uniform Memory Access
B. Network Unified Memory Architecture
C. New Unified Memory Allocation
D. None of these

Answer: Non-Uniform Memory Access

7. What is 'cache thrashing' in multi-core architectures.

A. Frequent invalidation of cache lines causing performance degradation
B. Increasing the size of the cache
C. Reducing memory latency
D. Allocating more memory to a single core

Answer: Frequent invalidation of cache lines causing performance degradation

8. How does hyper-threading improve processor performance.

A. By increasing the clock speed
B. By allowing more efficient use of CPU resources
C. By adding more memory
D. By reducing power consumption

Answer: By allowing more efficient use of CPU resources

9. What is a significant challenge of hyper-threading in terms of memory access.

A. Reduced memory bandwidth
B. Increased memory latency
C. Cache contention between threads
D. Decreased cache size

Answer: Cache contention between threads

10. In hyper-threading, what is 'resource sharing' among threads.

A. Each thread gets a dedicated set of resources
B. Threads share CPU and memory resources
C. Threads do not share any resources
D. Each thread gets more resources than usual

Answer: Threads share CPU and memory resources

11. What is 'cache coherence' in the context of multi-core processors.

A. Caches storing different versions of data
B. Ensuring all caches reflect the most recent data value
C. Increasing cache size
D. Reducing cache access time

Answer: Ensuring all caches reflect the most recent data value

12. What is 'memory latency'.

A. The time it takes for data to move from one core to another
B. The delay between a memory request and the start of data transfer
C. The total capacity of the memory
D. The size of the memory blocks

Answer: The delay between a memory request and the start of data transfer

13. What is the main purpose of virtual memory.

A. To increase the size of the physical memory
B. To provide an abstraction of the physical memory
C. To enhance the CPU speed
D. To manage input/output operations

Answer: To provide an abstraction of the physical memory

14. What is 'paging' in the context of virtual memory.

A. Dividing the CPU time among processes
B. Splitting memory into fixed-size blocks
C. Transferring data from cache to register
D. Organizing disk storage

Answer: Splitting memory into fixed-size blocks

15. In a paging system, what is a 'page fault'.

A. An error in the page table
B. An attempt to access a non-resident page in memory
C. A corrupted disk sector
D. A CPU scheduling error

Answer: An attempt to access a non-resident page in memory