

CA-3 /CSE-211(3)

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Questions/Answers

1. A digital computer has memory unit of $64K \times 16$ and a cache memory of 1K words. The cache uses a direct mapping with a block size of four words. How many bits are there in the tag and index bits respectively?

- ☐ 10 and 8
- ☒ 12 and 7
- ☐ 7 and 12
- ☐ 13 and 11

Clear selection

2. Which level of cache memory is typically the smallest but fastest in a CPU?

- ☒ A) L1 cache
- ☐ B) L2 cache
- ☐ C) L3 cache
- ☐ D) Virtual memory

Clear selection



3. Subtract 14 from 46 using 8 bit 2's complement arithmetic.

- ☒ 00100000
- ☐ 01000100
- ☐ 11011101
- ☐ 00100100

Clear selection

4. The number of 1's in the binary representation of $(3 \times 4096 + 15 \times 256 + 5 \times 16 + 3)$

- ☐ A) 8
- ☐ B) 9
- ☒ C) 10
- ☐ D) 12

Clear selection

5. What is the purpose of the write-back policy in cache memory?

- ☒ A) Data is written to cache only after it is modified
- ☐ B) Data is written to cache immediately upon access
- ☐ C) Data is never written to cache
- ☐ D) Data is automatically deleted from cache

Clear selection



6. In a direct-mapped cache, how many lines (or blocks) can each set hold?

- ☒ A) One
- ☐ B) Two
- ☐ C) Eight
- ☐ D) Unlimited

Clear selection

7. What is the primary reason for implementing a memory hierarchy in a computer system?

- ☐ A) To reduce the overall cost of memory
- ☐ B) To store data indefinitely
- ☒ C) To increase the speed of memory access
- ☐ D) To eliminate the need for main memory

Clear selection

8. The number (123456) radix 8 is equivalent to

- ☒ A) (A72E)₁₆ and (22130232)₄
- ☐ B) (A72E)₁₆ and (221311224)₄
- ☐ C) (A73E)₁₆ and (22130232)₄
- ☐ D) (A62E)₁₆ and (22120232)₄

Clear selection



9. Add -89.75 to +43.25 in 12 bit using 1's complement

- ☐ 00101110.1000
- ☐ 0010110.1100
- ☐ 1111010.1010
- ☒ 1010101.1000

Clear selection

10. What is the term for a situation where the processor must wait for data to be fetched from slower memory, causing a delay in program execution?

- ☐ A) Cache hit
- ☒ B) Cache miss
- ☐ C) Memory bottleneck
- ☐ D) Data parallelism

Clear selection

11. The use of "out-of-order execution" in modern processors is a technique to:

- ☐ A) Execute instructions in the order they are fetched
- ☐ B) Execute instructions sequentially
- ☒ C) Execute instructions as they are available, improving performance
- ☐ D) Slow down the processor to match memory speed

Clear selection



12. Assuming all numbers are in 2's complement representation , which of the following numbers are divisible by 11111011?

- ☒ A) 11100111
- ☐ B) 11100100
- ☐ C) 11010111
- ☐ D) 11011011

Clear selection

13. A memory access pattern in which data is accessed repeatedly from the same memory location is known as:

- ☐ A) Sequential access
- ☐ B) Random access
- ☒ C) Temporal locality
- ☐ D) Spatial locality

Clear selection

14. What is the term for a technique used to improve memory access times by fetching multiple pieces of data at once?

- ☐ A) Pipelining
- ☐ B) Multithreading
- ☐ C) Data parallelism
- ☒ D) Burst mode

Clear selection



15. In associative memory, data is accessed based on:

- ☐ A) A physical address
- ☒ B) The content or data itself
- ☐ C) A time stamp
- ☐ D) The file hierarchy

Clear selection

16. Which memory management technique involves dividing memory into fixed-size partitions, each capable of holding one process?

- ☐ A) Paging
- ☐ B) Segmentation
- ☐ C) Fragmentation
- ☒ D) Contiguous memory allocation

Clear selection

17. In a paged memory management scheme, what is a page?

- ☒ A) A fixed-size block of physical memory
- ☐ B) A portion of the CPU's cache memory
- ☐ C) A section of virtual memory
- ☐ D) A directory of files

Clear selection



18. (C012.25)H - (10111001110.101)B

- ☒ A) (135103.412)O
- ☐ B) (564411.205)O
- ☐ C) (564411.412)O
- ☐ D)(135103.205)O

Clear selection

19. When a program tries to access data that is not currently in physical memory, what occurs in a virtual memory system?

- ☐ A) The program is terminated
- ☒ B) Data is fetched from secondary storage into memory
- ☐ C) An error message is displayed
- ☐ D) The computer crashes

Clear selection

20. The term "clock speed" in a processor refers to:

- ☐ A) The number of cores in the processor
- ☐ B) The number of instructions executed per second
- ☒ C) The frequency at which the processor operates
- ☐ D) The size of the cache memory

Clear selection



21. In a symmetric multiprocessing (SMP) system, how are the processors typically connected?

- ☐ A) Each processor has a dedicated memory module
- ☐ B) Processors are connected in a star topology
- ☒ C) All processors share a common memory
- ☐ D) Each processor has its own cache memory

Clear selection

22. In a multiprocessor system, what is the purpose of load balancing?

- ☐ A) To increase the power consumption of processors
- ☐ B) To maximize cache memory performance
- ☒ C) To ensure that tasks are evenly distributed among processors
- ☐ D) To reduce the clock speed of processors

Clear selection

23. In a pipelined processor, which stage is responsible for fetching the next instruction from memory?

- ☐ A) Execute stage
- ☐ B) Decode stage
- ☒ C) Fetch stage
- ☐ D) Write-back stage

Clear selection



24. In a NUMA (Non-Uniform Memory Access) architecture, what does "non-uniform" refer to?

- ☐ A) Non-uniform clock speeds of processors
- ☐ B) Non-uniform distribution of memory modules
- ☒ C) Non-uniform memory access times for different processors
- ☐ D) Non-uniform cache memory sizes

Clear selection

25. A "complex instruction set computer" (CISC) microarchitecture typically supports:

- ☐ A) A limited set of simple instructions
- ☒ B) A large set of complex and versatile instructions
- ☐ C) A small number of pipeline stages
- ☐ D) A simple memory hierarchy

Clear selection

26. The term "speculation" in microarchitecture refers to:

- ☒ A) Making assumptions about the outcome of a branch instruction
- ☐ B) Reducing clock speed
- ☐ C) Managing cache memory
- ☐ D) Storing data in registers

Clear selection



27. In a multiprocessor system, what is the purpose of load balancing?

- ☐ A) To increase the power consumption of processors
- ☐ B) To maximize cache memory performance
- ☒ C) To ensure that tasks are evenly distributed among processors
- ☐ D) To reduce the clock speed of processors

Clear selection

28. What does Moore's Law suggest regarding the evolution of processors?

- ☐ A) The number of processors in a system will double every year.
- ☒ B) The number of transistors on a chip will double approximately every two years.
- ☐ C) Processor performance will remain constant over time.
- ☐ D) Processors will decrease in size with each generation.

Clear selection

29. Which company is known for producing high-performance graphics cards that are often used in gaming desktops and workstations?

- ☐ A) AMD
- ☐ B) Intel
- ☒ C) NVIDIA
- ☐ D) ARM

Clear selection



30. What is the purpose of an integrated GPU in many desktop processors?

- ☐ A) Improving single-thread performance
- ☐ B) Running virtual machines
- ☒ C) Handling graphics tasks without a dedicated GPU
- ☐ D) Enhancing cache memory performance

Clear selection

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