

CS-350: Topics for Term Papers

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1. System buses
 - a. Original PC Bus
 - b. PC/AT Bus
 - c. ISA Bus
 - d. failures: MCA and EISA Buses
 - e. VESA Local Bus (VLB)
 - f. PCI Bus
 - g. Advanced Graphics Port (AGP)
 - h. IEEE 1394 FireWire
 - i. Universal Serial Bus (USB)
2. Device Controllers
 - a. Serial Port (COM1, COM2)
 - b. Parallel Port (LP1, LP2)
 - c. Universal Serial Bus (USB)
 - d. Integrated Device Electronics (IDE) and Enhanced IDE (EIDE)
 - e. Small Computer System Interface (SCSI) in all its manifestations
3. Developmental History of main-line Intel CPUs
 - a. 4004
 - b. 8086/8088
 - c. 80186
 - d. 80286
 - e. 80386SX/DX
 - f. 80486SX/DX
 - g. Pentium
 - h. Pentium Pro
 - i. Pentium II
 - j. Variants on Pentium II: Xeon & Celeron (“Socket 370”)
 - k. Pentium III
 - l. Pentium IV
4. Competitor Chips: AMD
 - a. K6
 - b. K6-2
 - c. K6-III
 - d. K-7 (Athlon, a “Slot A” processor)
5. Competitor Chips: Cyrix

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- a. MII
 - b. Cayenne/Gobi (“Socket 370”)
6. Competitor Chips: Rise Technology’s mP6
 7. Competitor Chips: IDT subsidiary Centaur Technology:
 - a. WinChip C6
 - b. WinChip 2
 - c. WinChip 2+
 - d. WinChip 3
 8. Special Instructions for Graphics and Multi-Media
 - a. Intel’s MMX and “Streaming SIMD” extensions
 - b. AMD’s 3DNow
 9. Non-Intel-8086-family-Processors: Motorola 6800/68000 series CPU chips, and machine architectures utilizing these processors
 10. Non-Intel-8086-family-Processors: PowerPC CPU and companion chips, and machine architecture
 11. Non-Intel-8086-family-Processors: SPARC CPU and machine architecture
 12. Non-Intel-8086-family-Processors: MIPS CPU and machine architecture
 13. Non-Intel-8086-family-Processors: IBM R/S 6000 CPU and machine architecture
 14. Non-Intel-8086-family-Processors: SGI R10000 CPU and machine architecture
 15. 64-bit processors:
 - a. DEC/Compaq Alpha CPU and machine architecture
 - b. Hewlett-Packard’s PA-64
 - c. Intel’s Itanium (IA-64)
 - d. AMD
 - e. IBM
 16. Chipsets for PCs
 17. Mainframe architecture: IBM Series 360/370/390
 18. Mainframe architecture: IBM Series 36
 19. Mainframe architecture: IBM Series 38
 20. Minicomputer architecture: DEC PDP-11 and/or VAX

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21. Fault-Tolerant and High-Availability architectures: Tandem/16, Stratus, etc.
22. Supercomputer architecture: CDC
23. Supercomputer architecture: Cray
24. Supercomputer architecture: Thinking Machines
25. Supercomputer architecture: Intel
26. Dynamic Random Access Memory (DRAM)
 - a. simple DRAM
 - b. Fast Page Mode (FPM) DRAM
 - c. Extended Data Out (EDO) DRAM
 - d. Burst EDO (BEDO) DRAM
 - e. Synchronous DRAM (SDRAM)
 - f. Rambus DRAM (RDRAM)
 - g. Double Data Rate (DDR) SDRAM
27. Cache Memory (SRAM)
 - a. Associative cache
 - b. Direct-Mapped cache
 - c. Set-Associative Cache
 - d. Sector-Mapped Cache
 - e. Synchronous or Pipeline-Burst cache
 - f. Write-Through vs. Write-Back
 - g. Design and Usage considerations for Instruction Cache vs. Data Cache
28. Measurement of Computer Performance
29. Details of the "Boot" sequence for the PC for different operating systems: differences between *DOS*, *Windows95/98/Millennium* or *XP/Home*, *Windows NT* or *XP Professional*, and *Linux*
30. Floating-Point Representation and Arithmetic
31. "Plug-and-Play" ("Plug-and-Pray" may be more accurate)