EEL 6764 Principles of Computer Architecture
Midterm Exam Topics

Topics

The problems in the midterm exam are drawn from what's discussed for chapter 1 and 2, and appendices A and B. The following list shows major topics.

1. Computer Architecture vs. Computer Organization
2. RISC vs. CISC
3. System design parameters
4. Classes of parallelism and parallel architectures
5. Cost, Yield, Failure Rate, MTTF
6. Power and Energy
7. Design principles such as parallelism, locality, etc
8. Performance Metrics − Execution Time, Throughput, latency, CPI, IC, MIPS
9. Amdahl's Law
10. Need for memory hierarchy
11. Cache organizations − Direct mapped, set and fully associative
12. Cache operations − read & write
13. Evaluation of cache and overall system performance (AMAT & CPU time with cache)
14. Cache optimizations and their impacts on cache and overall performance
15. Virtual memory organizations − TLBs, Page Tables, Page Faults, etc
16. Virtual memory operations
17. Considerations & issues involved in ISA design
18. Features of good ISAs
19. Factors used to classifying ISAs
20. Memory addressing, byte ordering, alignment
21. Factors in instruction encoding

Preparation

- Read book carefully guided by lecture slides
- Review all homework problems and sample solutions thoroughly and make sure you truly understand how the solution is reached for every problem.
- Review all quiz problems, and make sure you truly understand all of them.

Format

- The exam is closed book, and closed notes.
- Everyone is allowed to bring to the exam a 8.5" $\times$ 11" paper with whatever information one would like to write back and forth.
- No electronics other than calculators is allowed.
- Formats of exam problems, subject to some minor changes
  - Short answer questions
  - Multiple choice questions
  - Questions that need calculations