CS430 Review

Computer Architecture vs Computer Organization

Stored-program concept

Structural View of the Computer

Structure of IAS computer

IAS Registers: AC, MQ, MBR, IR, IBR, PC, MAR

Micro-operations using IAS

Moore's Law and consequences of Moore's Law

Control Unit, ALU, I/O, Memory

Instruction Cycle State Diagram with/without Interrupts

Classes of Interrupts (Program, Timer, I/O, Hardware Failure), (maskable, nonmaskable), (hardware, software)

Program Flow of Control with/without Interrupts

Interrupt Handler

Of a user's running program, what needs to be saved before flow transfers to the interrupt handler? How does the flow transfer to an interrupt handler and how does the flow transfer back once an interrupt is handled?

Interconnection of modules (processor, memory, I/O)

Buses (control, address, internal data, external data)

Bus Architectures

DMA

Control Lines

Traditional Bus Architecture vs High-Performance Architecture

Dedicated vs Multiplexed Bus, Centralized vs Distributed Arbitration plus advantages/disadvantages of each

Synchronous Timing vs Asynchronous Timing including how reads and writes occur between various modules using the various synchronous & asynchronous timing

Memory Hierarchy (speed vs capacity vs cost)

Locality of Reference

SRAM vs DRAM

Cache/Memory Structure

In general, how does cache work and why is cache effective

Boolean Algebra (2-input variables & n-input variables)

Basic Postulates & Theorems will be given

Prove various theorems using only postulates

Basic Logic Gates (AND, OR, NOT, NAND, NOR, XOR)

Logical Circuits from Boolean expressions

Product term, sum term, sum-of-products, product-of-sums

Canonical expansion

Minimization using Boolean algebra and/or K-maps (2, 3, or 4 variable)

Nand-to-Nand or Nor-to-Nor two-level gate network

Note: The book has good problems for you to work through

Number conversions Binary, Decimal, HEX