

540 Exam Topics

1. Properties and differences of RISC and CISC architectures.
2. 4-,3-,2-,1-, and 0-Address Machines
For a given instruction/statement write its implementation in 0-address, 1-address, 2-address, 3-address
3. Given an instruction, calculate the memory required to fetch and execute the instruction.
Compute the total memory traffic.
4. Performance changes when using different architectures. As an example, calculate speedup when number of busses changes.
5. Definition of the following terms/concepts in the general purpose machines
 - a. Views of the computer
 - b. ISA(Instruction Set Architecture)
 - c. Fetch-Execute Cycle including interrupts
 - d. Instructions for subroutine call
 - e. Addressing modes: direct, indirect, immediate, register, register indirect, etc. addressing mode
 - f. Machine instructions
 - g. Machine exceptions
6. Pipelining
 - a. Given a set of instructions, find if any stalls are needed
 - b. Calculate speedup when moving to a pipelined architecture
7. Cache mapping scheme
 - a. If one of the cache mapping schemes among direct, fully associative, set associate mapping is given, identify either cache hit or miss based on the given address
8. Some Common Computational Type Questions
 - a. Given the number of instructions and registers, calculate the bits required to encode an instruction
 - b. Calculate CPI for a given system
 - c. Given a set of register/memory addresses/values, trace register/memory contents while a given instruction is executed
 - d. Find the location of an array element for a given base address and size of the array elements
 - e. Calculation of clock period, clock frequency
 - f. Computer arithmetic: addition, subtraction, division, and multiplication using 2's complements.
 - g. Calculate memory storage size for a given specific processor.
 - h. Calculate cache hit ratio, miss ratio, and average memory access time