

1. You have developed a very CPU-intensive program for solving cryptograms. You discover that on Microprocessor-X, this program runs in half the time that it takes on Microprocessor-Y. You conclude from this that Microprocessor-X is twice as fast as Microprocessor-Y. Give at least three reasons why this conclusion might be wrong.
2. What are RAW, WAR, and WAW hazards? How do they occur?
3. A given pipeline is capable of executing 100-million instructions per second. However, its branch-prediction scheme only works 50% of the time. The pipeline has five stages with branch-prediction being performed in stage 1 and branch-address-computation being completed in stage 4. If 10% of all instructions are conditional branches, how many instructions per second can be executed, assuming there are no other pipe-line stalls?
4. Explain the concept of dynamic scheduling, and how reservation stations are used in this type of scheduling.
5. Discuss the following terms, and explain how they affect cache performance.
  - a. Block Size
  - b. Cache Size
  - c. Set associativity
  - d. Write Through and Write Back.
  - e. Prefetching