

國立中央大學九十學年度碩士班研究生入學試題卷

所別: 資訊工程學系 不分組 科目: 計算機結構 共 / 頁 第 / 頁

1. Pipelining is an implementation technique in which multiple instructions are overlapped in execution. Under ideal conditions, the maximum speedup from pipelining equals the number of pipe stages. Identify as many reasons as you can why we cannot get the maximum speedup usually. (10%)
2. Please state two important advantages of the memory hierarchy. (10%)
3. We can improve the cache performance by reducing the miss rate, miss penalty, and time to hit in the cache. Please give a scheme for each of the above three cache optimization techniques. (15%)
4. Suppose we have an application that runs in two modes: all processors used and serial mode. Assume there are 100 processors in total. Find the maximum percentage that can be spent in the serial mode, if our goal is a speedup of 80. (10%)
5. Please explain the Amdahl's law. (5%)
6. 解釋下列名詞或簡答下列問題 (每小題 5%)
 - (a) List the 5 fundamental instruction types.
 - (b) Load and store architecture.
 - (c) Horizontal and vertical microinstruction.
 - (d) What are the 2 common methods of control field encoding?
7. Compare superscalar computer and parallel computer. (10%)
8. What is the main advantage of two-level control unit design (or called nanoprogramming)? Explain your answer in detail. (10%)
9. List 6 major attributes of RISC. (10%)