科目：計算機結構

1. [25%]Amdahl's law
   (a) Describe the definition of Amdahl's law.
   (b) Suppose we enhance a machine making all floating-point instructions run five times faster. If the execution time of some benchmark before the floating-point enhancement is 60 seconds, what will the speedup be if three-forth of the 60 seconds are spent executing floating-point instructions?

2. [25%] Briefly describe three types of pipeline hazards and describe how to overcome data hazards in the 5-stage RISC pipeline processors.

3. [25%] What are the concepts of out-of-order (OOO) execution? How do you keep the precise interrupt in the OOO processors?

4. [25%] Compare the concepts of scoreboard and the concepts of Tomasulo's algorithm, and describe how to use them when you will design the high performance processor.