1999 Paper 7 Question 3

Comparative Architectures

Why might a processor supporting "dynamic execution" (out-of-order execution with speculation) yield better performance than a statically-scheduled processor with a similar number of execution units? [5 marks]

Outline the operation of a dynamic execution processor. You should address the following issues in your answer:

- register re-use (name dependencies)

- arithmetic exceptions

- control-flow misprediction

- load/store ordering preservation

[10 marks]

What factors are likely to affect the amount of instruction-level parallelism that will be exploited by future processors? [5 marks]