1993 Paper 7 Question 3

Comparative Architectures

A revisionist view might be that a processor design is RISC if every transistor pays its way in terms of global system performance, i.e. the design is in some sense a local optimum. Explain how this view relates to the original definition of RISC. Can a CISC instruction set be RISC under such a definition?   [4 marks]

Given a certain silicon budget (e.g. 10^6 transistors) compare and contrast, under the above criterion, alternative ways of spending the excess over the (say) 10^4 transistor cost of a simple load-store one-accumulator machine. You might find it helpful to consider the various features and instructions of common processors.   [12 marks]

This budget is sufficient to build most, but not all, of a VAX. Which parts would you omit and how could you arrange to execute full VAX code?   [4 marks]