1997 Paper 8 Question 4

Comparative Architectures

A number of techniques exist to reduce the penalty of control-flow hazards. Discuss *four* of the following:

(*a*) delayed branches and annulment

(*b*) predicated execution and conditional moves

(*c*) dynamic branch prediction caches

(*d*) jump target hints and subroutine call return prediction stacks

(*e*) next-fetch predictors and branch target buffers

[4 marks each]

Why is good control-flow prediction so important to a dynamically scheduled superscalar processor? [4 marks]