

## 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]