

5 Comparative Architectures (RDM)

- (a) Why might a heterogeneous or asymmetric chip-multiprocessor be preferable to a homogeneous or symmetric one? [5 marks]
- (b) You are a computer architect working on the design of a new processor for the mobile phone market. An initial analysis of applications suggests that there would be worthwhile gains in producing a processor that could offer two different power-performance tradeoffs. The first configuration would maximise the exploitation of ILP and consume the most power. The second would on average perform less well, but would consume less power.
- (i) Describe how the microarchitecture of a single processor could be modified in order to offer the ability to switch between the two configurations described at run-time. [9 marks]
- (ii) How might one determine when to switch from one configuration to the other in order to reduce overall power consumption while minimising the impact on the user experience? [6 marks]