

2007 Paper 8 Question 3

Comparative Architectures

- (a) Why is multi-processing more important than ever? [3 marks]
- (b) Name the *two* basic forms of parallelism that are exploited by all new high-performance processors. [2 marks]
- (c) Which form(s) of parallelism is/are exploited by the following four styles of multi-processing: multi-core processors, coarse and fine interleaved multi-threading, and simultaneous multi-threading? Explain these terms and say how good each is at hiding memory latency. [6 marks]
- (d) How does compiler and operating system support need to differ for each form and style? [4 marks]
- (e) Thinking of the complete flow from high-level language design through to hardware execution, what tends to limit the available parallelism in a single thread? Suggest various ways of increasing it. [5 marks]