

## 2005 Paper 13 Question 2

### Computer Design

- (a) What is a *data cache* and why is it vital for high performance processors? [5 marks]
- (b) What is a *cache line* and how big is it likely to be? [3 marks]
- (c) What is a *page* and how big is it likely to be? [3 marks]
- (d) What is a *snoopy cache* and in what system is it likely to be used? [3 marks]
- (e) A computer system has the following memory parameters:

memory level	access time in clock cycles
first level cache	1
second level cache	3
main memory	100

If the probability of a hit in the first level cache is 80%, what hit rate do we need in the second level cache if the mean access time is to be two clock cycles? For this part, use the approximation that the cache line length is just one machine word. [6 marks]