

2011 Paper 5 Question 3

Computer Design

- (a) Why do modern processors need caches and what statistical properties do they exploit to improve processor performance? [5 marks]
- (b) How are cache tags used in direct-mapped and fully-associative caches? [5 marks]
- (c) A translation look-aside buffer (TLB) is a form of cache, but what does it store and how are TLB misses handled? [5 marks]
- (d) A processor architect proposes the use of a large direct-mapped TLB rather than the traditional small fully-associative TLB. What might the performance implications be? [5 marks]