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]