

2004 Paper 4 Question 5

Operating Systems II

- (a) Most conventional hardware translates virtual addresses to physical addresses using *multi-level page tables* (MPTs):
- (i) Describe with the aid of a diagram how translation is performed when using MPTs. [3 marks]
 - (ii) What problem(s) with MPTs do *linear page tables* attempt to overcome? How is this achieved? [3 marks]
 - (iii) What problems(s) with MPTs do *inverted page tables* (IPTs) attempt to overcome? How is this achieved? [3 marks]
 - (iv) What problems(s) with IPTs do *hashed page tables* attempt to overcome? How is this achieved? [3 marks]
- (b) Operating systems often cache part of the contents of the disk(s) in main memory to speed up access. Compare and contrast the way in which this is achieved in (i) 4.3 BSD Unix and (ii) Windows 2000. [8 marks]