COMPUTER SCIENCE TRIPOS Part IA – 2013 – Paper 2

4 Operating Systems (IML)

(a) What is the difference between a *logical* or *virtual* memory address and a *physical* memory address? [2 marks]

(b) Consider a variable which is bound to a single logical address for the duration of process execution. How is it possible for the variable to be bound to different physical addresses during process execution? [3 marks]

(c) In a demand paging system, what are the factors that can be taken into account when deciding which valid page should be made a victim? [5 marks]

(d) Consider a demand paging system in which hardware can trap unauthorised read or write accesses, but cannot perform any update to *use counts* or *written/dirty* bits. How can these be performed efficiently in software? [6 marks]

(e) What is *copy-on-write*? How can it be implemented in a demand paging system? [4 marks]