

## 2009 Paper 2 Question 4

### Operating Systems

- (a) In the context of virtual memory management:
- (i) What is *demand paging*? How is it implemented? [4 marks]
  - (ii) What is meant by *temporal locality of reference*? [2 marks]
  - (iii) How does the assumption of temporal locality of reference influence page replacement decisions? Illustrate your answer by briefly describing an appropriate page replacement algorithm or algorithms. [3 marks]
  - (iv) What is meant by *spatial locality of reference*? [2 marks]
  - (v) In what ways does the assumption of spatial locality of reference influence the design of the virtual memory system? [3 marks]
- (b) Buses are used to connect devices to the processor.
- (i) Describe with the aid of a diagram the operation of a *synchronous* bus. [4 marks]
  - (ii) In what ways does an *asynchronous* bus differ? [2 marks]