

## 1994 Paper 10 Question 6

### Operating Systems

An operating system supports multi-threaded processes. Within a given user-level address-space two threads cooperate by means of a shared, circular, N-slot buffer. Semaphores are supported by the language system.

Outline programs that may be executed by the thread which writes data into the buffer and the thread which reads data from it. [8 marks]

How would you ensure that several threads could write to, and read from, the buffer? [4 marks]

Explain how the semaphore implementation in the language system uses the thread implementation in the operating system. [8 marks]