Operating System Foundations

An operating system contains event management and process management modules. The interface of the former includes WAIT (event) and SIGNAL (event) operations to achieve hardware–software synchronisation. The interface of the latter includes BLOCK (process) and UNBLOCK (process).

(a) Outline the data structures you would expect to find in these modules to support event and process management. [6 marks]

(b) Describe the interactions between these modules as the system runs. [4 marks]

(c) Discuss the problems that can arise if concurrent invocation of the event management module is possible. [5 marks]

(d) Describe how these problems may be avoided if the operating system is guaranteed to run on a uniprocessor. [2 marks]

(e) Describe how these problems can be solved for a multiprocessor implementation. [3 marks]