

Chapter 20: System software: Answers to

Worksheet 20.1: for testing basic understanding

- 1 a The layered structure.
The modular structure.
- b
 - Accessing that part of the memory allocated to kernel use only. This is where the operating system code and related software, such as device drivers, are stored.
 - Use of certain system functions not made available to a user. System functions are usually available for such facilities as memory management, CPU scheduling and file management.
 - Interfacing to the hardware.
- 2 a A process in the ready state can be given access to the CPU as soon as its turn comes. A process in the waiting state cannot be given access to the CPU.
- b The only change possible is waiting state to ready state.
- c A process in the ready state cannot change to the waiting state. It can only change to the running state, after which it may change back to the waiting state. A process in the waiting state has been halted because it is waiting for some event to occur, usually associated with I/O. It will change to the ready state once the event has occurred.
- 3 Partitioning involves allocating areas of memory as self-contained partitions. Each partition can have one process loaded into it. The partitioning might be dynamic so that a partition size can be adjusted to fit the process size.

In paging, a process is split into equal-sized parts referred to as pages. Memory is then divided into frames each with the same size as a page. In a simple paged system, all pages are loaded into memory at the same time. In a virtual memory system, this is not necessary, and pages are loaded into memory as and when required.
- 4 A, D, F, B, C, E
- 5 The simplest possible scheduling algorithm is B. This is a E algorithm and can be implemented by placing the processes in the H in a C.

Alternatively a I algorithm allocates a K to each process and is therefore F because a process will be halted when its K has run out. It can be implemented as a B.

By comparison, a G scheduling algorithm is more complicated. Possible criteria are: estimated J; length of time A; whether the process is D.