Worksheet 20.1: for testing basic understanding

1 An operating system can be structured to contain a kernel.

a Identify two alternative possible approaches to this structuring.

b Describe three activities that only the kernel can undertake.

2 Two of the possible states for a process are the ready state and the waiting state.

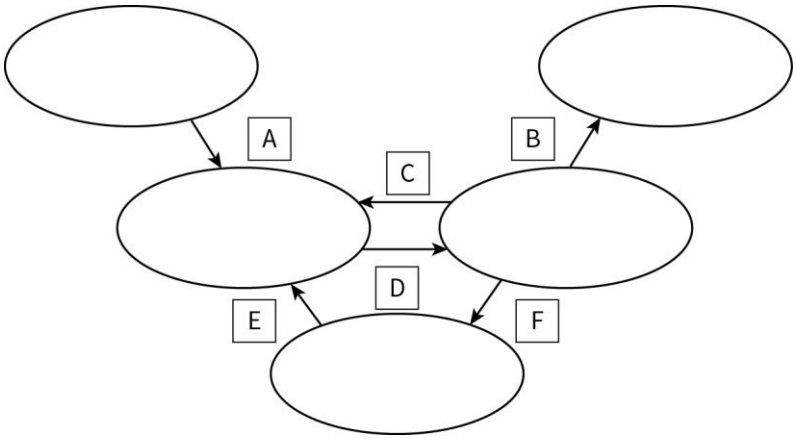
a Describe the differences between these two states.

b Is it possible for a process to change from one of these states to the other?

c Explain the reason for your answer and describe any conditions or events that are relevant to it.

3 Explain two differences between partitioning memory and using paging.

4 The schematic diagram below represents the different states possible for a process (but they are not explicitly identified) and the possible transitions between them. The transitions have been labelled A to F.



Match the transition labels, **A–F**, with the following descriptions, **a–f**:

a A new process arrives in memory and a process control block is created; it changes to the ready state.

b A process in the ready state is given access to the CPU by the dispatcher; it changes to the running state.

c A process in the running state cannot progress until some event has occurred (I/O perhaps); it changes to the waiting state (sometimes called the 'suspended' or 'blocked' state).

d A process in the running state completes execution; it changes to the terminated state.

e A process in the running state is halted by an interrupt; it returns to the ready state.

f A process in the waiting state is notified that an event is completed; it returns to the ready state.

5 Choose the correct word or phrase from the list, **A–K**, to complete the blank spaces in the following sentences.

The simplest possible scheduling algorithm is _____ . This is a _____ algorithm and can be implemented by placing the processes in the _____ in a _____ .

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

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

A already spent in the ready queue

B first come first served (FCFS)

C first-in first-out (FIFO) queue

D I/O bound or CPU bound

E non-preemptive

F preemptive

G priority-based

H ready state

I round-robin

J time of process execution

K time slice