



## 1.2.1 Scheduling

1. When running anti-virus software, an operating system uses a scheduling algorithm to allocate CPU time to the anti-virus software.

- a) Explain why a First Come First Served scheduling algorithm would **not** be suitable in this situation.

[2 marks]

- **First come first serve means jobs are completed in the order in which they arrive**
- **The anti-virus process could be forced to wait behind other processes, meaning a virus could execute before it is detected**
- **The virus checker may be running continuously**
- **... stalling the system and stopping other processes**

2. A computer is running a multi-tasking operating system and has access to a printer. The operating system uses scheduling algorithms such as first come first served and round-robin.

- a) Explain why the computer's operating system uses a First Come First Served scheduling algorithm when sending documents to the printer.

[2 marks]

- **For the printer queue**
- **All documents have equal priority**
- **Whichever document is received first is printed first**
- **Printing a document cannot normally be usefully split into small time slices, so allowing one document to complete before moving to the next is appropriate**

- b) Explain why the computer's operating system uses a round-robin algorithm for allocating processor time.

[3 marks]

- **To enable multitasking to take place**
- **To switch between active processes and those running in the background**
- **To allow processes an equal share of processor time**
- **... to ensure the OS cycles through all processes**
- **... so that users can receive an immediate response**
- **... to handle an interrupt immediately**





c) Describe **one** other scheduling algorithm.

[2 marks]

- **Shortest job first**
- **The process with the shortest estimated running time is selected first and runs until completion**
  
- **Shortest remaining time**
- **The process with the shortest estimated remaining running time is selected to run**
- **If a new process arrives with a shorter remaining time, the currently running process can be pre-empted**
  
- **Multilevel feedback queues**
- **Uses queues with different priorities**
- **Processes can move between queues depending on factors such as processor usage or waiting time**

3. Explain the purpose of scheduling.

[3 marks]

- **To make the most efficient use of the processor/resources**
- **Be fair to all users/applications**
- **Provide a reasonable response time**
- **Prevent process starvation, where a process waits indefinitely for processor time**

