**Activity 5 – Memory Management**

Task A

In the box below illustrate how the operating system manages memory. Some components have been provided for you on the left.

|  |  |
| --- | --- |
| Before:  Virtual  Memory  Main Memory  Data | Components: |

Task B

Answer the following questions on memory management.

1. What is memory management?

|  |
| --- |
| Process of controlling and coordinating computer memory, assigning portions known as blocks to various running programs to optimise the overall performance of the system. |

1. Why is memory management used?

|  |
| --- |
| Any from:   * It allows you to check how much memory needs to be allocated to processes that decide which processor should get memory at what time. * It also make sure that these applications do not interfere with each other. * Helps protect different processes from each other * It places the programs in memory so that memory is utilized to its full extent. |

1. What does it mean to swap data in and out of main memory?

|  |
| --- |
| Swapping is a method in which the process should be swapped temporarily from the main memory to the backing store. It will be later brought back into the memory for continue execution. |

1. List some benefits of swapping data.

|  |
| --- |
| * It offers a higher degree of multiprogramming. * It helps to get better utilization of memory. * Minimum wastage of CPU time on completion so it can easily be applied to a priority-based scheduling method to improve its performance. |

1. Data can be retrieved from secondary storage to main memory by using paging or segmentation.

What is the difference between paging and segmentation?

|  |
| --- |
| The only difference between the two is that segments are of variable-length, whereas, in the paging method, pages are always of fixed size. |

Task C

1. What is meant by the term ‘spooling’

|  |
| --- |
| A process in which data is temporarily held to be used and executed by a device, program or the system |

1. One common spooling process is the ability to manage tasks such as printing documents.

Describe how ‘print spooling’ works.

|  |
| --- |
| * Incoming print jobs are accepted from applications currently in use. * Spooler stores print jobs temporarily in a queue. * The spooler then controls the printer to put files one after another, using a first-in, first-out method. * This acts as an additional piece of software that runs in the background. |

1. Load up an image search using the keywords ‘print spooling’ and provide a screenshot to show what it looks like on a computer system.

|  |
| --- |
| How to Cancel or Delete a Stuck Print Job in Windows |

1. Identify the issues associated with storing print jobs in a ‘spool file’.

|  |
| --- |
| The spool file might have a memory limit which means once too many documents are sent then the spooler will stall. This can only be rectified when print jobs are released. |

1. Explain why a network is better equipped to deal with spooling.

|  |
| --- |
| A print server can be optimised in terms of hardware e.g. it can be given lots of RAM and a large hard disk so that it can store a lot of print jobs. This makes it efficient and able to deal with a large number of requests at the same time, thus leaving the networked workstations to continue working efficiently for the user. In addition to this, the spooler will be stored on the server and not individual machines. |

Task D

Describe what is meant by memory management.

Before you write your description, look at the answer builder tool underneath the help you.

|  |  |
| --- | --- |
| Description:  Data gets moved into virtual memory because the main memory gets full. Virtual memory is located in the hard drive and is managed by the operating system so when a space becomes available in the main memory, the operating system moves it out of virtual memory into main memory. | Example: |
| Answer builder:   |  |  |  | | --- | --- | --- | | ⚫ | ⚫⚫ | ⚫⚫⚫ | | Why does data get moved to virtual memory? | Where can virtual memory located? | What happens to do the data stored in virtual memory when space comes available in the main memory? | | |