

ASSESSMENT TEST 1

INSTRUCTIONS: Answer all Questions

(30 marks)

1. Differentiate between a relative filename and an absolute filename **(2 marks)**

Should provide an example of a relative vs absolute filename. A mark for each differentiation

Relative filename

A relative file name includes only the name given by the user. If a user created a file called Document_One, that would be the file name.

Absolute filename

An absolute filename includes all information including where the path is found. With the example before where our relative file name was Document_One, the absolute file name on a Windows machine would be C:\Users\Admin\Document_One.

2. Discuss the three multithreading models that exist within operating systems

(3 marks)

Half a mark for each model and half a mark to explain it

Many-to-One: This model supports many user-level threads to one kernel-level thread. Thread management is done within the user's thread library.

One-to-One: This model has a one-to-one relationship between the user-level and the kernel-level threads. The model supports multiple threads to execute in parallel on microprocessors

Many-to-Many: This model supports multiple threads to an equal number or smaller number of kernel threads. The user-level threads and corresponding kernel-level threads can run in parallel on a multiprocessor machine.

3. Differentiate between the Interactive and Real-Time operating systems (4 marks)

Interactive - These types of operating systems allow for multiple jobs to be processed simultaneously.

Real-time systems are used in time-critical environments [1]. These systems are used where reliability and deadlines are critical [1].

4. Discuss one benefit and one drawback of the first-fit system (4 marks)

Two marks for each benefit and two marks for each drawback

we can see that the scheme is not very efficient especially since the system could have supported additional jobs. The first-fit scheme ends up with a lot of internal fragmentation. This is one of the greatest challenges where memory is not used efficiently. A benefit is that it is a fast allocation scheme as it just checks for what is available and allocates it.

5. The biggest drawback of the segmented/demand paged memory is the need to access 4 tables meaning lots of overhead. Discuss how this can be mitigated (4 marks)

Review of what the 4 tables are and a discussion of the mitigation circumstances

The biggest drawback of this scheme is the need to access 4 tables meaning lots of overhead and the time it takes to reference the tables. One mitigation is the use of associative memory.

Associative memory is the name given to registers that are allocated to each active job [1]. The registers associate several segments and page numbers for a specific job and the main memory address [1]. Registers are generally hardware; therefore, the number of registers will be dependent on the type of machine.

6. Compare and contrast internal fragmentation and external fragmentation (4 marks)

A mark for each contrast and a mark for each example

External fragmentation is memory wastage but, in this case, outside of the partition. This was known as internal fragmentation [2] and it referred to the situation where a job would be fed into a partition so long as the partition was bigger than the job

7. Briefly discuss any two functions of an operating system (4 marks)

Booting a computer

Program management

Device management

File Management

Security Management

8. Using a diagram, show the different thread states as a thread moves through the system. (5 marks)

