Q.1 What are the two main functions of an operating system ?

Manages the input devices, output devices, and storage devices. -Manages the files stored on the computer. You just studied 33 terms!

Q.2 What is multiprogramming?

Multiprogramming is **a rudimentary form of parallel processing in which several programs run at the same time on a uniprocessor system**.

Q.3 List some differences between personal computer operating systems and mainframe operating systems.

Mainframe OS can be used by many users at the same time, whereas a personal computer operating system is generally designed for only a single user.

Mainframe OS is more powerful and expensive than PC OS.

Mainframe OS is designed to manage multiple I/O processes as it is designed for multiple users. But in PC OS, there can be just one user that can log in, hence they are designed to manage I/O processes for only a single user.

The main difference between the two OS is the hardware and how they utilize it. For a personal computer, the hardware is generally optimized to provide quick answers to the user. These are built for a lot of user interaction and are generally graphical interfaces or console interfaces on top of the kernel of an operating system. This kernel is generally a bunch of drivers that are connected together through the main kernel. Mainframes are generally less user-centered and are more used to process data. The single purpose of a mainframe OS is to process data as fast as possible. Mainframes are huge data factories while a PC is more a simple one-man workshop.

Operating systems for batch systems have simpler requirements than for personal computers. Batch systems do not have to be concerned with interacting with a user as much as a personal computer. As a result, an operating system for a PC must be concerned with response time for an interactive user. Batch systems do not have such requirements. A pure batch system also may have not to handle time-sharing, whereas an operating system must switch rapidly between different jobs.

Various operation systems operate the computer and the one that runs Mainframe computers include IBM Z series, Unisys Libra, UNIX, Windows, Unisys Dorado, and Linux. The operating systems that run personal computers include Microsoft Windows, OS X, Amiga OS, and Linux.

Q.4 What is the key difference between a trap and an interrupt?

The difference between a trap and an interrupt is that a trap is triggered by a user program to invoke OS functionality. Still, an interrupt is triggered by a hardware device to allow the processor to execute the corresponding interrupt handler routine.

Q.5 On early computers, every byte of data read or written was directly handled by the CPU (i.e.there was no DMA. What implications does this organization have for multiprogramming ?)

It makes multiprogramming less favorable since it is no longer the case that when one process does I/O the CPU is completely free to work on other processes.

Q6. Which of the following instructions should be allowed only in kernel mode?

(a) Disable all interrupts.

(b) Read the time-of-day clock.

(c) Set the time-of-day dock.

(d) Change the memory map.

Q7. Can the

count = write(fd, buffer, nbytes);

call return any value in *count* other than *nbytes*? If so, why?

Q8. A file whose file descriptor is *fd* contains the following sequence of bytes: 3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5. The following system calls are made:

lseek(fd, 3, SEEK\_SET);

read(fd, &buffer, 4);

where the lseek call makes a seek to byte 3 of the file. What does *buffer* contain after the read has completed?

Q9.

A computer uses the relocation scheme of Fig. 1-9(a). A program is 10,000 bytes long and is loaded at address 40,000. What values do the *base* and *limit* register get according to the scheme described in the text?