Quiz 1, Q&A

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

A. An operating system must provide the users with an extended (i.e., virtual) machine, and it must manage the I/O devices and other system resources.

Q What is multiprogramming?

A. Multiprogramming is the rapid switching of the CPU between multiple processes in memory. It is commonly used to keep the CPU busy while one or more processes are doing I/O.

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

A. Personal computer systems are always interactive, often with only a single user. Mainframe systems nearly always emphasize batch or timesharing with many users. Protection is much more of an issue on mainframe systems, as is efficient use of all resources.

Q. A computer has a pipeline with for stages. each stage takes the same time to do its work, namely, 1 nsec. How many instructions per second can this machine execute?

A. Every nanosecond one instruction emerges from the pipeline. This means the machine is executing 1 billion instructions per second. It does not matter at all how many stages the pipeline has. A 10-stage pipeline with 1 nsec per stage would also execute 1 billion instructions per second. All that matters is how often a finished instructions pops out the end of the pipeline.

Q. What is the essential difference between a block special file and a character special file?

A. Block special files consist of numbered blocks, each of which can be read or written independently of all the other ones. It is possible to seek to any block and start reading or writing. This is not possible with character special files.